Baltic Sea Region

Strategic Instruments for Sustainable and Entrepreneurial Capacity Building

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In the Baltic Sea Region (BSR), in accordance to European Union objectives of an inclusive society, sustainable values and tackling the grand societal challenges is the foundation and aspirational target to create the future and regional growth.

Due to their complexity, the grand societal challenges require boundary spanning collaborations across different scientific, economic, engineering and other disciplines, and multi-level governance across sectors, regions and countries. Grand societal challenges involve the whole society. As an example, climate change is not only an environmental problem, it has an impact on everything in people's lives in economic, social, cultural and environmental spheres. It is evident that climate change can't be solved through environmental policy actions alone but needs a systemic approach. It involves heterogeneous partners from research, engineering, business, policy-making and civil society. The challenge is how to include all stakeholders and society to make it happen.

This study follows up on the challenge on how to become sustainable and entrepreneurial and what kind of capacity building and tools are needed to get mobilized. We followed the Smart Specialisation strategy and sustainable development goals' implementation in the Baltic Sea Region on how regions foster a balanced evidence-based economic transformation and answer the urban challenges. The regions gain advantage from a joint cross-regional actions and reflection on what capabilities are needed for regional policies, and communities, to move steadily towards a transition towards a digitized, globalised, and diverse economy.

In addition, this study analyses the actions taken by the BSR regions participating in the Smart-Up BSR thematic pilots with the idea to point out effective regional entrepreneurial leadership and thematic transnational collaboration based on entrepreneurial mindset and evidence-based policy making. The analysis of how to take action confirms, the importance and need of capacity building instruments for regional economic transformation.

This book describes the strategic capacity building and tools are essential and required for regions on developing and implementing Smart Specialisation strategies and regional sustainable growth with impact. Strategic capabilities are essential for cross-regional work when aiming at sustainable economic transformation as the cross-regional aspect is not yet clearly pursued in strategic action.

This book is built on the dialogue around capacity building in cross-regional context. By examining a set of capacity building and implementation tools, we propose to continue the dialogue and encourage regions to implement the capacity building tools to better build on their regional innovative activities and to generate incentives for inter-regional opportunities. For the regions, it is a competitive advantage to gain knowledge on how to effectively operationalise Smart Specialisation related policies and local strategies within the scope of UN SDGs and the European Green Deal, in a digital and inclusive economy.

While regions can dispose of several strategic instruments, this study propose the use of the Regional Strategy Diamond, the Organisational Innovation Competency Set, and the Innovation Camps as strategic capacity building tools. Regional strategy diamond indicates the importance of intentionally pursuing balance between priorities, scope, and policies and actions to achieve sustainable and entrepreneurial economic transform in the regions.

In combination, these instruments can increase the efficiency in the implementation of regional change, by enabling communities of action to recognise the interdependent nature of social and economic transformation. Therefore, capacity building has a crucial role in resolving not only regional specific, but also various common needs in the Baltic Sea Region. It can reinforce cooperation and engagement within and between regions to

co-create new practices and to balance priorities in RDI and entrepreneurial activities.

The innovation actors benefitting from this book are locally and regionally intertwined while operating at different scales, regionally, nationally or internationally. In addition, institutions at EU-level supporting regionally linked stakeholders are key actors in evidence-based policy making for place-based action. In this context the application of specific tools to balance action is crucial to ensure action and correction of action.

Finally, this study has concluded that the path to sustainable and entrepreneurial economic transformation of regions goes through experimentation, prototyping and implemention. The strategic capacity building and tools applied virtually and physically, are essential and allow macro-regional collaboration, active engagement of different stakeholders, and implementation of UN SDGs and Green Deal.

PREFACE

We all are stakeholder in creating strong and prosperous communities. We are actors in regions fuelling their innovation eco-systems and looking to build competencies for implementing a sustainable transformation. Learning from the realities of how several Smart Specialisation strategy pilots were conducted across Baltic Sea cities and regions, we saw the need to develop tools and instruments that have the ability to support economic development and to promote a sustainable implementation.

By applying these strategic tools in regions can implement their innovation strategies and policies and thereby support communities in their transition towards becoming sustainable and entrepreneurial, globally connected and locally rooted regions.

Our study proposes to examine how thematic pilots in the Smart-Up BSR are conducted in some BSR regions. We see the opportunity to expand on the learnings from the strategy creation processes and the updates and revisions of the Smart Specialisation strategies preparing for the 2021-2027 period.

The idea of our study is to contribute to the understanding of economic and societal value with regard to implementing EU macroregional strategies, in this case the European Union Strategy for the Baltic Sea Region (EUSBSR). In doing so, our study ensures that an efficient toolset is available for regions on their journeys towards sustainability and entrepreneurial evidence-based policy making.

The insights on the implementation of Smart Specialisation strategies in the Baltic Sea Region, also linked with the EUBSR priority area Innovation, have been gained through the flagship project Smart-Up BSR. The intense work involving multiple Baltic Sea Region stakeholders in Smart Specialisation was done with the help of numerous colleagues in the partner institutions. The aim has been to induce a specific identity of Smart Specialisation as a collaborative instrument. We believe that collaborative action and determined implementation of sustainable and entrepreneurial economic strength is best achieved by means of a community of belonging.

We want to show our deep appreciation to all the participating organisations from each region, for their enthusiasm in applying new tools, and their willingness to partake in reflecting on the learnings. Capacity building needs consistent new input and efforts which can be provided by reflection and peer learnings and by constant partnering among regions. We all have benefitted from a sense of belonging and we sincerely hope that our collaboration will continue and persist.

Taina Tukiainen and Patrizia Hongisto
Helsinki, in September 2020

FOREWORD

Markku Markkula

Vice-President, European Committee of the Regions
Chair of Espoo City Board
President, Helsinki-Uusimaa Regional Council

Globalisation, digitalisation, climate change and demographic change are vivid examples of the challenges and factors shaping our future. What roles do the EU and the regions have in facing these challenges? And how to seize the opportunities for new business developments, especially start-ups, to utilise digitalisation – in the sharing economy, the circular economy and the silver economy?

I stress the real-life practice: we, in other words the regions of Europe, together with cities and other municipalities are the backbone of the European Union – now and even more in the future. Why? In the multi-governance EU, we are closest to European citizens. We have a crucial position in the current political context – for encouraging collaboration, unity, and understanding European values and disseminating good societal practices. In this regard, regions together with municipalities have an integral role to play; and we can boost competitiveness for transformation by providing important innovation platforms and co-creating ecosystems for all communities, including companies, start-ups, universities and citizens. Smart Specialisation is an excellent instrument for fostering competitiveness at regional, local – and through them – European and global levels.

Increasingly it is emphasised that the goals for a better future are going to be achieved only by working together. This is true for resilient cities, and it is true for prospering as well as rising regions. City initiatives, cross-regional and international initiatives assemble communities to work towards answering the technological, societal, digital and climate challenges and towards accelerating new solutions for safe, inclusive, climate-proof, and resource-efficient habitats.

In this vein, this study proposes to widen the scope of the initial objective of the EUSBSR of ”increasing the prosperity and innovation” in the BSR, to create cross-regional action-taking communities around sustainable goals. This study spurs towards action. Based on the results detected in practical piloting work diverse capacity building instrument has been highlighted, including the regional strategy diamond, the organisation innovation competency set, and the innovation camps. I stress the usefulness of these strategic instruments in local activities in cross-regional entrepreneurial evidence-based policy making.

Realising impactful, dynamic and entrepreneurial policies will serve place-based innovation ecosystems in diverse ways. Most importantly they will allow actions that mutually benefit collaborating regions and the BSR macro area as a whole.

I want to congratulate those who made this project a reality – and I want to highlight the importance of what Smart-Up BSR has created for supporting regional development and innovations, including encouraging the UN Sustainable Development Goals Agenda 2030 implementation in the Baltic Sea Region. The study gives clear evidence: Smart Specialisation work has shown that innovation and development policies in the Baltic Sea Region have led to high performance and have brought prosperity on various grounds.

This booklet encourages the regions in the Baltic Sea Region to be better equipped to deliver the implementation of Smart Specialisation in their region. By securing changes towards sustainability in governance, business and quality of life Baltic Sea Regions societal and economic achievements can rise to global relevance.

1 INTRODUCTION

1 INTRODUCTION

"The world is entering a new technological, social and global age and it is our ability to create meaning which will decide whether we face a bright future or a tragic decline".

(Tomas Björkman)[1]

The argument that society can be changed by local efforts and by building a community of people mutually supporting each-other's wellbeing and leading a purposeful life is not an unknown aspiration for European society and is recently mostly linked with the Nordic model. The European Union objectives of an inclusive society come close to be a reality in the ways Nordic democracies have succeeded to create wellbeing for their citizens. However, the task of continuing to maintain spaces for inclusive democracy and sustainable economies includes the challenge of implementing change and building strong cross-regional communities. The Baltic Sea Region (BSR) is up to this challenge.

The aspirations of inducing positive change and opening up to extended communities emphasize the importance of a balance within the playfield of regional actors. It is also a pre-requisite for cross-regional balance. It is important to gain understanding not only in how to maintain the position the BSR has managed to reach within Europe and globally, but also to create clarity on how to build a solid (macro)regional identity in responding to the ever-growing challenges pertaining to sustainability and the future of our planet.

The challenges to be resolved are many-fold, they contain i.e. factors such as technological expertise, capability facets, and several aspects in organisational and governance domains. Regional innovation, growth, and entrepreneurial development depends on balancing capabilities when answering those challenges. In this study we focus on the required capacity building. We find this is an important facet of the discussion of economic transformation through Smart Specialisation strategy. Each territory adopting the Smart Specialisation approach has a rising interest in regional growth based on sustainable values, to be achieved by means of entrepreneurial action that includes all layers of innovation, including societal innovation.

The regional perspective of innovation as a driver for economic transformation is a key factor for achieving prosperity and quality of life. Especially in times of crisis, such as the COVID-19 outbreak, cooperation spanning national government and regional governance has proven to serve citizens and businesses in the best way. In such unprecedented and unpredictable transformation of the economic landscape regional response is crucial, and regional and cross-regional implementation in BSR reflects the potential of Europe to maintain and improve prosperity and resilience.

From a macro-regional perspective, the deep concern for the state of the Baltic Sea has been a factor that combines the efforts of the various countries of the Baltic Sea Region. The Baltic Sea is not spared by the consequences of a growing economy that takes its toll on environment. Each regional actor in BSR is both a beneficiary and a governor and custodian of what the sea offers for the people, their wellbeing and their livelihood. Sustainability is therefore core of each region's strategy drawing advantage from the BSR location.

If we look at priority setting in the BSR region, we also notice that the current focus of the Arctic Council is on sustainable development as an overarching theme. Of the four priorities, two cover the environment with climate and green energy as well as marine environment. People and communities of the Arctic are another priority that is crucial for sustainability. Similarly, the three objectives of the European Strategy of the Baltic Sea Region (EUSBSR) are 'Save the Sea', 'Connect the Region' and 'Increase Prosperity'. In the agenda program for the EUSBSR 2020 Annual Forum it is stated that the three priorities "should be treated

as interconnected and indivisible as the UN Sustainable Development Goals" (SDGs).

With this socio-geographic strength in mind policy domains are being reconceived and BSR Smart Specialisation roadmaps in BSR regions are moving sustainability to the centre. Sustainability is a cross-cutting perspective that serves the whole Baltic Sea Region environmentally and economically. However, instruments and delivery channels are needed to induce action. It is a basic premise of this study to elaborate on what can ensure that innovation is linked with place-based achievements which are in turn built around cross-regional cooperation.

While the set objectives in BSR economic transition have impact at the local and regional levels, it is increasingly important to realize that each region's transformation can be magnified at cross-regional level. This necessitates strong and capable regions that interact with each-other and regions with capabilities to implement both local priorities and cross-cutting policies that serve economic and societal transformation.

The large-scale cohesion programs at EU-level that are implemented since 2012 rest on regional transformation through Smart Specialisation. However, regions need to shake policy ideals which have been resting on reproducing specific models of innovation systems as remedies for market failure. Smart Specialisation offsets the belief that policy can be 'applied everywhere irrespective of regional preconditions and place-specific potential for and barriers to innovation'. (Asheim, Isaksen & Trippl, 2019, p.96) As the EU Multi-annual Financial Framework is being agreed upon among European member states regional instruments gain in importance to secure industrial investments, sustainable development and synergies between financial instruments.

In this respect, Smart Specialisation for the economic development of regions directs local actors towards a view of innovation that goes beyond replicating innovation systems of high performing and winning regions. Instead, it is tied to specific regional policies that seldom integrate cross-regional aspects to enable sustainable entrepreneurial action. We can consider this cross-cutting regional perspective to innovation as a key element of implementing the Green Deal and Europe's high-level objectives.

With the intensifying challenges of social and economic response to crises and disruptions, climate change, health threats and aging population, we claim that instruments to activate communities and increase strategic focus for innovative action taking need to be given more attention. Also, we notice that as the Vanguard Initiative for growth through Smart Specialisation advises, regional innovation ecosystems and European strategic value chains need to be at the core of the EU recovery to the COVID-19 crisis.

Now that the EU industrial ecosystem landscape needs to be further strengthened, interregional cooperation unavoidably needs to take centre-place. At the High-level Directors' of the Vanguard Initiative in June 2020 it was confirmed that interregional cooperation and cross-cutting thematic elements will be the way forward for European industry to recover and stay sustainable through a Green transition driven by digitalisation and thus benefit European citizens. Within this context and with the aim to ensure that BSR regions locally and collectively implement the UN SDGs, this study emphasises keeping in mind cross-regional capacity building as a cross-cutting guiding principle.

By examining several BSR regional implementation pilots in specific sustainability and societal wellbeing thematic areas our study leads us to look for suitable strategic instruments that help regions implement their economic transformation strategies in a sustainable and entrepreneurial manner.

Baltic Sea regions and municipalities have adopted the Smart Specialisation concept in their innovation strategies in a relatively short time. Though a good number of successes have been reached some of the challenges point towards a lack of practical experience among regional decision-makers and implementers. Capabilities are needed to turn strategies into action-oriented approaches.

Changes are already happening, as e.g. the initially insufficient stakeholder integration in Smart Specialisation processes is being recognised and addressed. We suggest that to benefit from the increased stakeholder cooperation a capacity

building approach can lead to transformative results.

Although we recognise that some creative and integrative approaches can be noticed in the Baltic Sea Region implementations, our question is: Do regions have the capacity building tools to establish an entrepreneurial process of sparking economic transformation? And regarding the organisations involved in strategy implementation we also need to ask: What are supporting entrepreneurial instruments for regions to utilise not only locally, but also in order to leverage the full macro-regional strength and collective knowledge leading to transition into innovation and regional economic transformation?

To tackle this, attention needs to be given to capacity building. In chapter three we will present a set of instruments that benefits regional policy implementation through action. Based on our study of BSR regional pilots we derive capacity building instruments that overcome the main challenges regions face: impactful action by developing entrepreneurial approaches to strategic implementation.

In order to learn about ways to impact regional spatial, economic, and societal development we are not only interested in how regions can implement Smart Specialisation and thematic pilots, but more importantly, how regions build competencies for continuous transformation. We ask what instruments can be used to balance action-driven and solution-focused activities with ways to evaluate and redirect. Strategy actions need to meet the aspiration of citizens by mutual empowerment. This will lead to an inter-regional collaborative commitment in BSR to create a sustainable, inclusive, just society that enables its citizens to achieve wellbeing and have a choice of opportunities to live and work successfully.

1.1 Motivation, Challenge and Research Questions

> *The European Green Deal … supports the transition of the EU to a fair and prosperous society that responds to the challenges posed by climate change and environmental degradation, improving the quality of life of current and future generations.*
>
> (The European Green Deal, 2019, p.22)

The challenge that needs to be answered by regions in collaboration with others and other levels of governance responsible for innovation and economic development is:

How to make regions more sustainable and entrepreneurial?

Besides leading discussions and shaping ideas on how science and policy connect in transforming regions through innovation, we need to look at what is happening at the moment when regions push for innovative actions. Therefore, we ask:

What kind of strategic instruments and capacity building tools are needed?

We know that regions have diverse set of partners and organisational approaches behind economic initiatives. Therefore, we need to go beyond showcasing the priorities and spearheads for investments as a result of Smart Specialisation processes. We need also to address the question of how to ensure strategic capacity building that enables a sustainable and entrepreneurial transformation.

By asking the questions of how to position the Baltic Sea Regions' innovation performance we learn the importance of Smart Specialisation strategy to test and revise priorities. Yet to understand the overall challenge of Smart Specialisation implementation we need to be sure that the instruments which help regions in their economic transformation are available.

Capacity building is especially relevant when wide stakeholder involvement needs to be orchestrated. While increasing the constellation and dynamics of stakeholders means leveraging

on the regional innovation ecosystems, it also means a balance in the integration of place-based development with cross-regional functions. Integrating place-based strategy implementation with the demands of SDGs brings new proposals, new partnerships, new interconnected policies. Recruiting administrative and political actors into these processes and implementing Smart Specialisation in practice needs the attention to go into balancing efforts. Also matching local, national, EU and global processes needs a set of instruments to achieve the balance.

From the BSR regional Smart Specialisation strategy stories we learn that opportunities rise not only from commonalities as is usually assumed, but also from divergencies. This challenges us to set in motion local and regional, but also cross-regional capacity building.

In order to find answers for this study's challenge of how to make regions more sustainable and entrepreneurial we examine a set of capacity building tools that allow actions and practices to take place specifically in the regional or city driven environment and to balance the wider cross-regional collaboration.

1.2 Structure of the Book

> *"There are to an ever-increasing extent demands that innovation and innovation policy should not only lead to economic benefits but should al so result in enhanced capacities to tackle grand societal challenges."*
>
> (Asheim, Isaksen & Trippl, 2019, p. 115)

The following chapter, chapter two, takes stock of the conceptual and practical issues around strategic priorities in Smart Specialisation in BSR and how implementation can be impactful.

With a view of how transformational processes can be actively be promoted cross-regionally and at macro-region level, chapter two includes a selected group of activities around the concept of thematic piloting (active healthy aging, smart city, climate change, circular economy) as a method to increase innovativeness at inter-regional level. Thematic piloting in the four chosen themes derives from the goals of the European priorities, but more importantly, as the pilot analysis for BSR shows, it can be considered a major playfield for sustainable and entrepreneurial economic transformation that requires capacity building.

The contributions of the Baltic Sea regions with their Smart Specialisation strategy creation and revision processes lead us to ask what lessons can learned and what tools are needed for regional implementation. We therefore proceed in chapter three to device a set of instruments that can be used to effectively change the behaviour of regional organisations and their economic transformation efforts.

Chapter three presents three specific approaches that serve as strategic instruments. These comprise a set of strategic tools to address the need for capacity building. The proposed sets of strategic change management instruments are valuable to drive change forward in regions and cities. The instruments are described within a framework of why, who, how, and what actions. Essentially these are the angles that capacity building helps to solve.

To conclude, chapter four presents the key findings and introduces recommendations for regional innovation actors who are active in driving regional change, implement strategic priorities cross-regionally, and achieve economic transformation through innovation and entrepreneurial mindset.

2 URBAN CHALLENGES AS IMPETUS IN BALTIC SEA REGION STRATEGIC ACTION

2 URBAN CHALLENGES AS IMPETUS IN BALTIC SEA REGION STRATEGIC ACTION

All EU actions and policies will have to contribute to the European Green Deal objectives. The challenges are complex and interlinked. The policy response must be bold and comprehensive and seek to maximise benefits for health, quality of life, resilience and competitiveness.

(The European Green Deal, 2019, p.3)

Smart Specialisation creation, revision and implementation, provide some knowledge how the evidence-based approaches have been realised in the Baltic Sea Region. Moreover, knowledge on Smart Specialisation strategy responsibility and ownership (which could be residing in either national, or regional/local, or specifically appointed coordinating agencies or drivers) provides additional understanding on the possible tensions towards practical steps in the process.

The regional organisations which were assigned to work with regional actors and stakeholders on Smart Specialisation have reflected on the ways to ensure its practical implementation. In their BSR strategies analysis[2] Tukiainen and Hongisto (2020) emphasise balance. Regions that show imbalance may be missing the competences to put their strategy into action. Balance means that prioritising one angle, such as strategy itself, or leadership, of a heavy organisation in leading the region, cannot lead to a high performance or successful development if not accompanied by actions, building on competencies, and steering towards competitiveness. Each angle and dimension, as well as the links among them, affect one another. Regions need to focus on capacity building to ensure this balance.

In practice, an understanding of the efficiency of different change management instruments can be formed through the experiences of organisations with the responsibility for Smart Specialisation strategy creation and implementation. By reflecting on their regional Smart Specialisation strategy implementation, they can arrive at insights on how to navigate in the context of economic transformation within the BSR.

The BSR has a wealth of experience among regions scoring as innovation leaders and other regions which are following closely and showing determination in their governance and leadership to steer economic transformation through evidence-based approaches to innovation. Based on their reflections we can attempt to grasp what Smart Specialisation currently means for the BSR and its SDG targets as well as how and why it can spur motivation for cross-regional transformation in the macro-region. As a result, we can assess what improvements in the capabilities can be envisioned that can lead to appropriate strategy implementation to meet future challenges.

When attempting to implement inter-regional inclusion it is also beneficial to consider specific cross-issue approaches that combine different priority themes. This is especially relevant from a perspective of policy to ensure regional economic transformation while attaining EU-agenda and SDGs related goals. Such themes as we proposed in this study are: Wellbeing and sense of belonging (including Active Healthy Aging); Climate change and Circular Economy; Smart cities and smart ports.

2 Tukiainen and Hongisto's analysis of the strategy creation and revision processes presents the experience of ten regions representing each BSR country: Aarhus and Central Denmark Region, Berlin/Brandenburg regions, Estonia and Tallinn, Helsinki-Uusimaa region, Kotka/Kymenlaakso region, Latvia, Lithuania, Gdansk-Pomorskie-Sopot region, St. Petersburg region and Stockholm region.

2.1 Sustainable Strategy, Governance and Leadership in the Baltic Sea Region

The economy is a diverse social space in which we have multiple roles.

(Gibson-Graham, Healy, Cameron, 2013)

While Smart Specialisation as an approach is a way to strengthen specific focused areas, it is also instrumental for re-examining governance and leadership issues regarding innovation and expanding capacities for inter-regional collaboration to maintain regional innovation capability and ensure sustainability. How are these processes driven forward in the Baltic Sea Region?

When we look at how BSR regions advance towards Smart Specialisation strategy creation and governing practices we see that regions are driven mostly by a major city, a university city, a port city, or the country's capital city. Even so, in some countries the direction is not determined locally and in collaboration with industry but steered nationally. BSR Regions are therefore still developing competencies to balance strategic strengths at different governance levels.

Regional level processes tie strategy work to local needs and demands, thus reflection on these processes is crucial for leveraging the benefits of larger stakeholder engagement. Stakeholder involvement has been a part of the process in each region's Smart Specialisation strategy development and has shown varying degrees of improvement. Especially in the revision process stakeholder engagement has played a more significant role. The Smart Specialisation concept of stakeholder involvement characterises the core of Smart Specialisation processes. Essentially, in the Smart Specialisation strategy process we find that enrolling stakeholder action is in line with the innovative approach to governance in triple and quadruple helix contexts where innovative technologies and innovative cooperative relationships are key elements at different municipal and regional levels.

A feature of Smart Specialisation strategy creation, development, and revision is that it can be embedded in sustainable service provision by public and private actors. This is seen by the emphasis on citizens' services in several of the strategies of some Baltic Sea regions, such as Helsinki-Uusimaa, Midtjylland and Stockholm. Services fostering entrepreneurship and supporting SMEs with innovation and commercialisation are at the forefront of some of the regions, with more emphasis on logistics and Smart ports (Kymenlaakso region in Southern Finland, Estonia, and Poland).

In a place-based approach to economic transformation innovation and smartness are in fact related to their specific spatial, infrastructural and socio-political contexts. As an example, we observe that for example regions relying on actions from clusters, as in the case of the Danish decentralised business support strategy and the joint Berlin/Brandenburg InnoBB strategy do not as such emphasize new industrial paths creation through new cluster building, rather the strategies embed existing clusters with their future priorities.

What differs among regions is whether clusters are entrusted with the strategy implementation phase, as in the example of Midtjylland and Berlin/Brandenburg. In other cases, a specific agency leads from strategy creation to implementation (Lithuania), or public sector governance units carry locally the responsibility for Smart Specialisation creation, implementation, monitoring and revision. Some BSR regions rely on clusters. cluster-centred implementation rests on the assumptions that clusters may possess strong sectoral evidence needed for evidence-based strategic prioritising. Yet, they would benefit from tools which can better guarantee the needed synergies thus allowing regional actors to draw from a wider and balanced pool of actors.

The strategy work in the Baltic Sea regions reveals issues on two crucial steps towards preparing the path for regional economic transformation: regional / national balance of the governance structure and focused priority setting for regional innovation policies. For Smart Specialisation strategy creation and the prioritisation of regional spearheads regions largely comply with the goal of involving a large number of regional stakeholders (Tukiainen and Hongisto, 2020). With the effort to improve Smart Specialisation implementation in the Baltic Sea Region, priority could turn out to be a differentiator. From this perspective a balanced execution of the evidence-based approach to policies is an important factor to arrive at favourable priority choices.

Strategic priorities can be bundled either at regional level, at city level, or at national level. While some of the regional Smart Specialisation strategies in the Baltic Sea regions studied indicated national level priorities as benchmark for the regional themes, in most of the cases the regional level of economic development strategy was dominant. Except in the Baltic countries the strategy work is done independently from the national strategy, whereas in e.g. Latvia and Lithuania the economic development strategy follows closely the national prioritizing. In some cases, the strategies have a generalist approach which gives general direction or a national overview but has yet to reach the level of actionable priority areas for regional economic transformation that Smart Specialisation is able to provide.

Where the Smart Specialisation process was possible to be organised at regional level, Baltic Sea regions have indeed taken efforts to conduct multi-stakeholder strategy work and implementation. Stakeholder involvement, albeit in a more limited way, has also taken place in some cases where national government institutions oversee regional decision making with regard to Smart Specialisation strategy. What is important is that the strategy creation and revision process need actionable instruments to succeed as a key factor in shaping and re-shaping regional objectives and priorities.

While evidence-based strategizing can be effective in dealing with certain underlying structures of economic development, it can turn out to be restrictive if the outlook is directed inward and instruments are missing which can unlock the perspectives. Regional engagement involving public administration, or similar coordinating local actors, can bring businesses, industries, public sector and academia closer to each other when working on a specific focus. This can be achieved when a coordinating agency or responsible stakeholder is able to build on existing relationships by succeeding to enrol regional collaboration around the agenda of a strategic balance. There are different ways to direct the regional actors to collaborative action and simply a focus on strategic, but collaboration is promising in regions where it builds on active dialogue and exploration.

Regions where strengths are particularly attached to urban strongholds or where strategy is driven nationally may not be able to equally serve the rural or dispersed areas around major hubs through their Smart Specialisation strategy. While this shortcoming may be linked to governance, the regional examples in Tukiainen and Hongisto study suggest that horizontal themes, such as digitalization, logistics, or harbour management related digitalised solutions, can bridge local industry in marginalised areas. Regions therefore benefit from competencies to guide horizontal action. These cross-cutting themes can succeed in linking marginalized territories with the more urban areas which are driven by science and technology.

Tensions between local, regional and national orchestrators are pervasively present in the Baltic Sea Region. A possible exception can be mentioned with regard to the strategy stories of the Finnish participating regions Helsinki-Uusimaa, and Kotka-Kymenlaakso. Several Finnish regions have organised themselves and created self-orchestrated collaboration that binds regions together in Smart Specialisation strategy work and implementation.

When Smart Specialisation creation, revision and implementation are analysed from the perspective of attributed responsibility and ownership, the authority or agency responsible for carrying through strategic implementation

as a transformative process benefits from such capabilities. This level of competency is relevant to consider for complementing the perspective of governance, and the political ownership of strategic action for a particular region.

Towards Grand Societal Challenges

Grand societal challenges involve pressing real-life problems related to environment, health, and quality of life which all cities and regions face, not only the BSR. Due to their complexity, they require boundary spanning collaborations across different scientific disciplines, and multi-layered governances across sectors, regions and countries. Climate change is not only an environmental problem: its effects will alter people's lives in economic, social and environmental spheres. It is evident that climate change can't be solved through environmental policy actions alone but needs a systemic approach. It involves heterogeneous partners from research, engineering, business, policy-making and civil society.

Coordinating and facilitating innovation efforts in regional contexts is usually the prerogative of the public sector, yet results can only be achieved through public and business sector sharing a vision of a sustainable region, country and planet. Not only research and knowledge, but also the cultural capital and creative input of local citizens combining resources and collective human capital can activate local change. Several BSR cities and regions show results achieved shaped by the actions of citizens, creative communities, and SMEs sharing a vision for their regional transformation.

It is necessary to deal with the challenges that cities face at multiple connecting levels supporting engagement in public policy and SDGs. An important aspect is establishing a more direct interface between European cities and the European Commission services. The Cities Science Initiative for Urban Challenges shows there is a shared need and willingness from both professionals in EU institutions and from city experts to interact closely on research and urban challenges.

Recently, in the BSR strategic action is increasingly being taken towards sustainability mainly linked with grand societal challenges or urban challenges. Several UN voluntary reports national and regional have been submitted during the last three years, linking climate change, circular economy and healthy ageing to SDGs. Often these are often jointly approached in Smart cities or in Smart Ports. Smart citizens, government and business solutions require involvement of diverse stakeholders on local and international levels and can function as a basis for SDGs and Smart Specialisation strategies and implementation. SDGs related transformation brings economic results by linking and attracting businesses, linking and attracting talents, fostering human capital inclusively.

As has repeatedly been stated, societal challenges are systemic and non-linear, requiring out-of-the-box thinking. Embracing ambiguity and showing receptivity to new ideas in multi-actor settings is key to solving the complex challenges encapsulated in the SDGs. The Smart Specialisation approach recommends that regions focus their efforts and resources on a limited number of ambitious yet realistic priorities. Uniting the many national and regional stakeholders in the BSR around a shared vision for development in favour of the SDGs requires increasing efforts towards an inclusive approach to innovation.

It is also worthwhile remembering the relevance of Smart Specialisation strategies in how the public sector can stimulate discussion and increase stakeholder interaction. Stakeholder groups linked with themes which affect sustainability can build a shared vision around regional strategies that recognisably have a direct relation to SDGs. The focus is not on sustainability exclusively, but thematic pilot implementing e.g. Smart Cities or Active Healthy Aging contribute directly to the sustainable development.

Shaping the Sustainable EU Agenda and UN SDGs in the Baltic Sea Region

The knowledge and practices of several expert organizations in sustainable development are useful to regions in implementing actions supporting sustainability and SDGs. Such expert organisations are EARTO, the joint network of European research

organizations, the Global Covenant of Mayors for Climate and Energy, the newly established Nordic Climate KIC, which is part of the EIT. Regional stakeholders and partners, such as universities, research institutions, regional councils have direct contacts and/ or are operational members within these. In addition, through the regular work of the Committee of Regions (CoR) issues of sustainability are interlinked with topics related to the regional efforts of Baltic Sea regions.

Objectives in the work to enrol regional stakeholders for cross-regional BSR sustainability include a) Identifying issues and problems to tackle around carbon neutrality and circular economy (e.g. plastic waste) in the Baltic Sea Region; b) Building on regional objectives for a cross-regional vision, strategy and concrete set of actions for the BSR Region regarding grand societal challenges, e.g. climate change, circular economy, healthy ageing; c) Stimulating engagement and collaboration with businesses, start-ups and other stakeholders -citizens, academic institutions, municipalities in the pioneering actions related to grand challenges in Baltic Sea Region.

From the Commission's perspective six priority domains are identified to secure Europe's future[3]. Each can be pushed by innovation and provides a direction for the Baltic Sea Region economic transformation. The six priority areas[4] are:

Innovation is seen as the key to solving the systemic challenges that lie behind these priorities. Solutions need the mobilisation of all resources and actors and regional implementation is the next vital step towards realising these goals at local level.

The role of regional transformation becomes apparent if we at look the first two goals, the European Green Deal and the European digital strategy.

The European Green Deal, as the new growth strategy for the EU as a central step towards a liveable and prosperous environment across Europe propagates improving the opportunities in each region. As Europe's action plan, the Green Deal involves multi-layered action taking by all sectors of the economy to maintain inclusive prosperity across regions (for more details on the Green Deal see Annex II).

In addition, the EU's digital strategy aims to steer measures that support this systemic transformation while making this transformation work for people and businesses. In doing so it contributes to achieving the target of a climate-neutral Europe by 2050. (For specific action areas directed by the European digital strategy see Annex II).

By implementing Smart Specialisation and SDGs related priorities and thus creating better conditions for the BSR regions to cooperate in the innovation and entrepreneurship activities, the target goes beyond shaping and transforming each region individually. The elevated aim is also to enhance measures that are easier attainable in the BSR as a smart macro-region.

Examples from the chosen spearhead topics that gain from cross-regional cooperation include Active Healthy Aging, Smart City, Climate Change, and Circular Economy. Based on the BSR innovation camp processes that this study has used, some of the partnering regions have focused their special interest on one or several of these themes to further develop Smart Specialisation policy implementations.

Attention needs to be given to how BSR regions can put the inter-regional collaborative aspect in perspective with their own variations of local challenges. Therefore, regional actors need to secure the competences needed for strengthening not only the implementation of the chosen spearheads but also cross-regional approaches. As regions are increasingly linking the way Smart Specialisation strategy induces economic transformation with SDGs opportunities strategy contributes in pushing forward actions supporting the UN Sustainable Development Goals. Actions need to follow.

The outcome of collaboration between institutions within a region, across regions, and internationally is not a formula that fits all.

3 https://ec.europa.eu/info/strategy/priorities-2019-2024_en

4 https://ec.europa.eu/info/strategy_en

However, reaching a cross-regional dialogue is advantageous to adjust a regional balance and also keeping an outward looking perspective that induces action. Strategic capabilities to shape strategy implementation supporting SDGs actions are a means to actively shaping wellbeing and sustainability that serves all BSR citizens.

Table 1 Political Strategic Priorities for Europe

A European Green Deal	to be the first climate-neutral continent as a modern, resource-efficient economy
A Europe fit for the digital age	a digital strategy towards empowering people with a new generation of technologies
An economy that works for people	a more attractive investment environment, growth for quality jobs for young people and small businesses
A stronger Europe in the world	Europe's voice in the world to champion multilateralism and a rules-based global order
A European way of life	to protect the rule of law, to stand up for justice and to guard the EU's core values
A new push for European democracy	to protect our democracy from interference i.e. disinformation and online hate

2.2 Entrepreneurial Regional Leaders in the Baltic Sea Region

Our economy is the outcome of the decisions we make and the actions we take.

(Gibson-Graham, Healy, Cameron, 2013)

The Baltic Sea Region includes top performing regions occupying the very highest positions as Innovation Leaders in the European Union. The grouping of regions which represent innovation leaders includes regions that have consistently acted within the Smart Specialisation concept of strategy creation, revision and implementation, but it also includes leaders, such as Stockholm, that has gone a different path.

When comparing the innovation performance of the Baltic Sea regions with reference to the Regional Scoreboard Innovation Index, the profiling of top regions by innovation indicators shows that the improving or weakening of their performance can be linked with proxies for Learning regions, as well as for full-scale Capacity power houses.[5] Among the regions in the lower end of the innovation index scale a willingness to operationalise Smart Specialisation appears to be a driving force and a means for the regions to emerge as thriving markets.

The exact three dimensions that correlate with the long-term top-performance of regions like Helsinki-Uusimaa and Stockholm are: Life-long learning, Trademark applications, Scientific co-publications. This combination criteria indicates top performance and importantly it denotes a regional balance. The three indicators secure a balance of entrepreneurial capacity and scientific/ research competence supported by a wide-ranging

5 A detailed analysis can be found in Tukiainen and Hongisto (2020).

societal effort in upholding skills and knowledge. This indicates the importance of a constellation of strategic actions working together.

However, while as an entry point it is useful to look at the positioning of the BSR region according to European and Regional Innovation Scoreboard (EIS, RIS), we also need to look at how governance structures have influence and how Smart Specialisation is in fact operationalised. We can gain knowledge on the strategic path of Smart Specialisation strategy towards regional implementation by examining procedural facets. This would include practical measures of strategy creation, governmental and administrative processes, stakeholder engagement, monitoring, revisions and road mapping.

Each of these dimensions contain a high degree of entrepreneurial facets. Regions sharing this combination of indicators are identified as capacity powerhouses best positioned to tackle the challenges of sustainability and entrepreneurial activity.

The variety of positionings among the regions means that across the Baltic Sea there exists a potential for growth through inter-regional collaboration to lead these regions towards an improved position in innovation performance and an overall economic transformation. While Smart Specialisation strategic actions has clarified the focus of the economic drivers in these regions the practical cross-regional implementation has not been approached in a consistent way by the Smart Specialisation strategies.

The impetus for a strategic entrepreneurial approach can be found from broader cross-sector themes where cities and science and policy makers are in tune. We have several examples in the BSR heavily involving research feeding innovation (e.g. the Helsinki-Uusimaa Region, Tallinn in Estonia, Aarhus in Midtjylland, Riga in Latvia). Connecting science, policy and people happens in pilots and experiments and an entrepreneurial way that necessitates practical instruments to orchestrate the cross-sector themes and cross-regional workshops leading to specific actions.

Differences in dynamics between larger central cities and smaller and more peripheral one could be offset by collaboration. The urgencies to solve local issues, and the possibly closed municipal cultures make it hard for local actor when meeting urban challenges to find support within their local structures for participating in cross-issue international networks. However, through the example of entrepreneurial leading regions we see that an emphasis on research on collaboration including research and cross-issue collaboration in an entrepreneurial way has a two-fold strategic purpose: to achieve technological excellence and innovation on one hand, and, on the other hand, to fulfil a broader societal purpose.

While both the technological and the societal perspective have a global dimension, the latter has a global reach through practical responsibility. Thus, regional practical actions are closely linked to global climate responsibilities in addition to having local impacts.

Local benefits achieved can be an improved quality of life or innovative outcomes of entrepreneurial activities. It means reaching a balance of regional strengths performing a harmonizing act between supporting traditional and proven sectors while directing them into new potential industrial paths.

Several regions present up-front strategic choices relating to citizens' quality of life, green initiatives, alignment with SDGs. This is a challenging approach of combining breadth with focus. When successful, as it can be noticed in the BSR entrepreneurial innovative leaders, this combination could be outlined as a necessary combination for regional economic transformation. Yet, some regions relying on previous hierarchical governance traditions, lack the instruments to cut through a maze of diversity in order to reach a clear choice of priorities. Diversity may also be connected to path dependency, where choices are added to existing industrial paths while making the region less open for new opportunities through for inter-regional engagement.

Smart Specialisation work has shown that innovation and development policies in the Baltic Sea Region have led to high performance and have brought prosperity on varying grounds, either through science, knowledge and economy, or digitalisation, or logistics and harbour developments. This would include emphasising

research, constantly applying revisions to Smart Specialisation, securing stronger implementation and consequently strengthening the BSR as macro-region.

If regions that to some extent have employed triple and quadruple helix approaches as a modus operandi already prior to the introduction of Smart Specialisation have a head start in the way innovation and regional development strategic processes are put into action. This would indicate that regions starting to include science-based policy making and entrepreneurial implementation can follow in the transformation through cross-regional collaboration. Following this direction with persistence would strengthen the regions on the long run and with the right tools a vivid inter-regional cooperation can be maintained.

Smart Specialisation has contributed in a positive way to the focus and prioritisation of innovation strategies and related policies, which is made apparent in the innovation performance of the regions. However, a leap forward can be achieved in economic transformation of the BSR when SDGs are integrated in strategic local action.

Smart Specialisation has also faced complexity resulting in regional/local and national tensions. However, regions are in better position to solve urban challenges through balancing Smart Specialisation priorities. The actions triggered by Smart Specialisation can expose administrative models that don't necessarily serve the innovative development and need to be adjusted to balance socio-economic disparities between territories.

Many challenges in the Baltic Sea Region are of cross-sectoral nature similar to the SDG challenges. Possible solutions to these challenges benefit from being addressed together by various countries and sectors. In examining the environment in which Baltic Sea Region's companies, industry, and communities operate we come across a wide perspective of inter-related regional issues characterising a sustainable and entrepreneurial future. This adds the perspective of cross-issue relevance for regional innovation and is based upon the understanding that events, activities, governance of innovation, and political ownership benefit from an entrepreneurial interconnected approach.

Although it is not always easy to work towards creating cross-issue collaborations, Smart Specialisation strategy work has to some extent provided the space to explore and develop ideas for new shared ways of talking, strategizing, and taking action. With Smart Specialisation strategy in mind the relevance of cross-issue approach can be understood to successfully bring together an inspiring vision of the macro-region: the Baltic Sea Region governance supporting persistent action for prosperous businesses and civil society.

Towards a City Science Approach

Most capital regions in BSR fall in the science and technology driven category of regions. In their approach can recognize a commitment to an expertise driven strategy that pushes forward the innovation capacity of the region. Their challenge is to guarantee the necessary knowledge and expertise on a constant basis by strategic associations to industrial sectors, and research supporting their entrepreneurial domain.

This reality of BSR leading entrepreneurial region promises to put in action what the report on City Science for Urban Challenges establishes.[6] While cities are complex social, physical, technological and ecological communities they have the collective power to act on environmental sustainability and on social community building dealing with polarisation among citizens. Both aspects include entrepreneurial opportunities for local businesses and an improved life quality. Cities have this chance by responding to urban challenges by designing and implementing evidence-based policies and by participating in ground-breaking research for identifying new solutions.

Nevertheless, like the technological science driven hubs, also BSR regions with harbour areas and logistics hubs clearly benefit from linking the high-end research and science driven priorities. This is specifically the case where the research

6 City Science for Urban Challenges. Pilot assessment and future potential of the City Science Initiative 2019-2020.

emphasis is linked with the locally grounded industry. Science and technology are the top performing core of relatively small regions like Tallinn and Aarhus, as well as cities and regions in Latvia and Lithuania who need an increased labour force. For these regions science and technology and the scope of integration with local industry are the determining factors of their strategically chosen innovation outlook.

The changes in regions comprising port cities like Riga, Liepaja, Vilnius, Klaipeda, Gdansk, and Kotka, and the recent company developments related to the port in the Kymenlaakso region in Finland support the understanding that Smart Specialisation strategy and its emphasis on research collaboration can lead to opportunities for local companies in small regions to excel in innovation even in a highly competitive environment. Logistics and transport related areas can be leveraged thanks to the ability to experiment and exploit close-at-hand application domains resulting from research collaboration. This can link logistics, energy, and construction with new technological and research driven sustainable solutions and provide entrepreneurial opportunities.

From the perspective of utilising science as a driving force it is relevant to observe the dynamics of resourcing innovation capacity. The science and research driven strong hubs in any of the studied regions of the Baltic Sea Region show a pattern of accumulating resources, in terms of funding and competences, being able to engage in locally relevant solutions and serve the local population, including local SMEs, and functioning as the motor of the region. This provides a locally based vision leveraging on links to a knowledge economy and thus increasing the growth potential of locally rooted industry.

2.3 Urban Challenges for a Sustainable Baltic Sea Region

> *"The UN Sustainable Development Goals, the climate challenge, the growing number of elderly people over the coming years are realities that lead the transformation of both our own organizations and our citizens to act in an increasingly technological world."*
>
> (City of Aarhus)[7]

> *"Finnish cities, and Espoo as a forerunner amongst them, find Agenda 2030 and the SDGs a good fit to describe their present and future work. Cities and SDGs are a match forged in every day pragmatic work in order to serve our citizens."*
>
> (City of Espoo)[8]

There is a growing recognition that for regional innovation systems to push forward regional transformation regions need to work together and create an inter-related vision of what a sustainable society could be. The Baltic Sea Region countries progressively cooperate on shared agendas and lead a lively dialogue on joint solutions to challenges in several different constellations and formats.[9] This is not only because multi-disciplinary and cross-sectorial approaches are believed to deliver the most innovative results, but essentially regions in the BSR strive for cooperation towards a sustainable Baltic Sea environment. In this they rely on actions that are guided by Smart Specialisation

7 Holmgård, S., Stannov Søvsø, K., Rosengren Danielsen, P., (2020) Lessons from Smart-Up BSP Pilots, Report from the City of Aarhus.

8 UN Espoo Voluntary Local Review 2020, p. 5. https://www.espoo.fi/en-US/City_of_Espoo/Decisionmaking/The_Espoo_Story/Sustainable_Espoo/Projects_of_Sustainable_Espoo/Espoo_Voluntary_Local_Review(183296)

9 Examples of collaboration are Arctic Council and the European Strategy for the Baltic Sea Region.

priorities and the UN SDGs for sustainable cities and regions.

BSR policies and horizontal actions related to shared global challenges are constantly being translated into regional implementation to solve evolving urban challenges. The joint BSR concern for the common sea and for the wellbeing of its citizens shapes the key principles for emerging areas of cooperation.

Especially in the attempt to create sustainable policies and implementation actions, BSR cities and regions need to rely on strategies that are not limited to single issues, but powerful and relevant for issues of sustainability and wellbeing which are linked to each other. These urban challenges necessitate a unique and necessary focus on science and research which can help key players to deal with the challenges they face.

While working on multi-level governance issues BSR cities, regions, and citizens would benefit from a cross-issue approach such as city science. This would provide knowledge of available practices, resources and tools through a 'just-in-time' research approach. Such outcomes would help city and regional development officials to arrive at key urban solutions principles. Once established through multi-level governance, solutions need to be applied across different stakeholders, across industrial areas, and across territories. Therefore, we need to ensure that we employ helpful tools to tackle cross-issue perspectives.

In practice, as pointed out in the quote above by the city of Aarhus, solutions to local development issues and challenges that cities face will most often contain a significant element of digitalization and will require implementation of technology. In addition to technology, as pointed in the quote by the city of Espoo, the future of cities and regions is forged in daily work serving citizens and by citizens. Both aspects, technology and citizens, need to be taken in consideration and integrated into the core of sustainable economic transformation and Smart Specialisation strategies. An agenda for the future from a citizen's perspective has been explored as recently as 2020[10] by a High-Level expert group of DG Research and Innovation (R&I) of the European Commission and by the City Science Initiative (CSI). The guiding principle for the work of CSI is that cities have become 'communities of (complex) systems and people'.

In this view, the cross-cutting dimensions of thematic pilots of urban challenges lead to concrete activities putting strategy into practice to improve local everyday life. In our study of the pilot activities in BSR regions we have come across the complexities of transferring knowledge and experience from strategies towards implementation and economic transformation. Coordination actions were taken to engage EU level experts to assist in the activities, thus creating cooperation channels between SDGs and Smart Specialisation actors for regions to reach the high-level goals of the EU and SDG agenda.

Four areas have been observed which particularly provide a basis for an integral and cross-sectoral approach and which BSR cities and regions need to consider as part of the urban challenges they face: Active Healthy Aging, Climate Change, Circular Economy, and Smart Cities / Smart Ports. In the following, some developments in the BSR are presented within the framework of these urban challenges.

Answering the Challenge of Active Healthy Aging

Healthy ageing is about "optimizing opportunities for good health, so that older people can take an active part in society and enjoy an independent and high quality of life" (Swedish Institute for Public Health). This approach emphasizes how older people can contribute in valuable ways to the functioning of the society, building on their skills and experience. Yet this requires system-wide support to introduce necessary health promotion interventions on societal level, and construct opportunities for more active involvement of older people to solving societal challenges & tasks.

Preventive and pro-active health care and Active Healthy Ageing in the BSR are an important

10 The Human-centered city, opportunities for citizens through research and innovation. (2020) European Commission, Directorate-General for Research and Innovation.

part of Smart Specialisation entrepreneurial delivery as well as new knowledge creation by sharing findings on how to empower innovation and growth. The Nordic welfare system 2.0 could function as a steppingstone for a BSR health and wellness approach benefitting the whole BSR population.

In order to optimize the AHA approach as a societal solution and boost its economic advantage we can benefit from mapping the health start-up industry. The health eco-system is exceptionally diverse when considering the supporting, regulatory, and funding entities that it includes. Several BSR cities have collaborated in mapping the most important players in the industry, as they provide support start-ups specifically focusing on the health and wellness sector.

Helsinki as a hotbed for innovations and the region of Helsinki-Uusimaa values the aim of a well-connected start-up ecosystem. This is particularly true for health and life sciences start-ups as the fastest-growing industries in the region are health and neurotechnology. The University of Helsinki, Aalto University in Espoo and the Cities of Helsinki and Espoo set a common goal in 2016 to develop the region into the best Northern European hub for life science, health-related innovations and business development. This decision was based on the numbers of organisations, hubs and accelerators dedicated to the health sector.

Players such as Health Capital Helsinki, Terkko Health Hub and Upgraded contribute to strengthen the connection within the ecosystem, accelerate innovations and attract foreign investments and companies to partner. Helsinki's trust-based atmosphere allows collaboration between the public and the private sector to run smoothly.

While Finland is one of the few countries in the world that has developed a nationwide network of biobanks the capital region has a lot to offer in terms of research and development and taking advantage of funding opportunities and a great experimentation infrastructure. Key research sectors in the area include oncology, ageing, neurotechnology, food chain and microbiome.

Health Capital Helsinki follows the ambition to build the greatest health capital by boosting collaboration in its health ecosystem and by enabling start-ups to emerge and innovation-driven companies to grow. The alliance supporting Health Capital Helsinki consists of major cities, hospitals and educational institutions in Finland as part of the regional eco-system depicted below in the form of a metro map.[11]

The Health Capital Helsinki operates to develop and promote its unique ecosystem the Health Capital Helsinki attracts collaborators and investors within health and life sciences. By catalysing the formation of new start-ups, growth companies and investments its aim is to accelerate the development and maturing of life science and health tech start-ups. This however is only possible when integrating other regions and fostering larger cross-regional collaboration which helps increase the number of relevant collaboration projects and funding schemes. This is why Health Capital Helsinki is a major driver in mapping the eco-systems of other cities and regions which are major

11 The Helsinki Health Ecosystem mapping commissioned by the Helsinki-Uusimaa Regional Council, 2020, distinguishes nine lines: Growth Line (Accelerators, projects and hubs which offer services for start-ups on their journey of accelerating their businesses); Hub & Community Line (Multiple organizations, associations, and networking hubs whose aim is to provide for start-ups office and co-working spaces as well as labs, event spaces, networking events, training); Health Hub Line (Multiple organizations, associations, and networking hubs whose aim is to provide help for start-ups specifically providing their solutions on the fields of health and wellbeing); Corporate Line (The corporates which offer challenges, cooperation, funding or even physical hubs for start-ups and small size companies); Support & Expertise Line (Accelerators, projects and hubs which offer services for start-ups on their journey of accelerating their businesses); Funding Line (gathers options on private funding and collects public institutions and entities that can offer funding for development, internationalisation, expansion or projects); Hospitals & Test Labs (The players with whom start-ups can test and verify their solutions on the clinical level and that can serve start-ups as the entry points to public healthcare institutions); Education Line (The educational institutions which offer study options supporting or specifically focusing on fields that are related to healthcare); Event Line (Accelerators, projects and hubs which offer services for start-ups on their journey of accelerating their businesses).

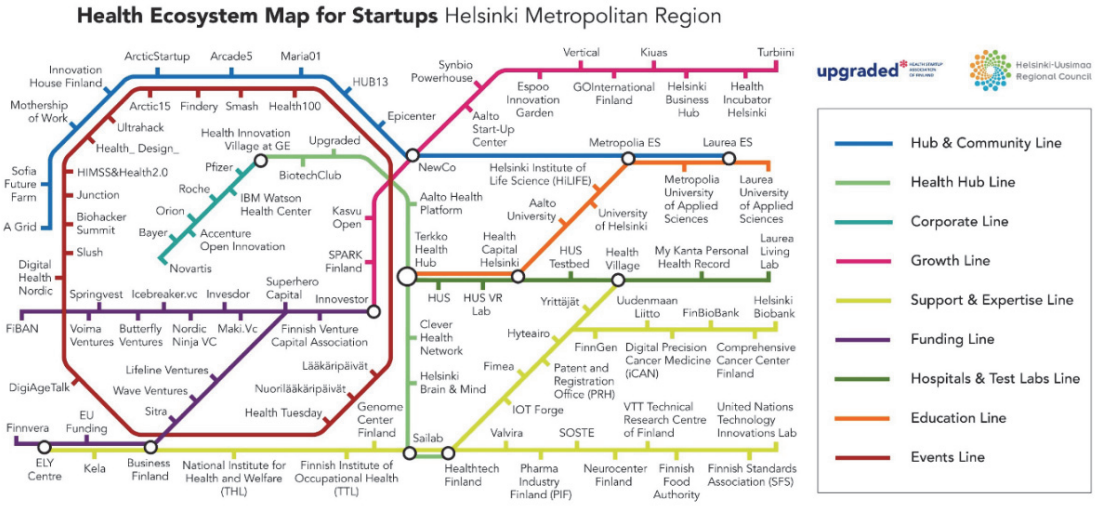


Figure 1 Active and Healthy Aging Network Mapping for Helsinki-Uusimaa

hubs in health and life science. Currently the Nordic capitals Stockholm[12], Copenhagen[13] and Oslo[14] have been mapped in addition to Helsinki, and the work will be expanded into BSR regions.

The Nordic research environment encourages teamwork, collaboration and innovation. It is important to extend intra-regional and cross-regional cooperation in the BSR and leverage from the well-connected eco-systems already in place between research institutions, university hospitals, pharmaceutical companies, biotech start-ups, technology companies, service providers and other health organizations. An advantage in the Nordics is that laws and regulation are transparent, and the actors as well as citizens can rely on a well-functioning system for ethical approval. While the Nordic regions are home to some of the best life science and medicine universities there is a strong connection between academia, industry and the healthcare sector.

In addition, the Nordics include easy access to accurate and comprehensive medical data, and strong involvement of the population in clinical trials and medical research participation. However, it is important to remember that the macro-area counts as favourable for a drug pipeline, research and development investment and quality infrastructure, such as IT devices, MedTech devices and clinical equipment, this is done on the basis of a strong principle of making health and well-being accessible to everyone. Therefore, successfully encouraging innovation in diverse sectors such

12 Stockholm with its reputation of being a unicorn factory is the second-best producer per capita in the world after Silicon Valley. Besides banking, financing and IT, life-science is one of today´s strongest industries in the Stockholm region. Investments have been made in hospitals and ground-breaking research infrastructures, such as the renowned Karolinska Institute, as well as in providing access to large medical databases, registries, biobanks and patient population. The culture of creation and innovation starts in the city´s education system, which highly promotes entrepreneurship. Stockholm's key expertise includes diverse areas in healthtech, biotech, MedTech and pharmaceutical. Some of the city's strongholds include neuroscience, stem cell, metabolic diseases, cancer, molecular bioscience, ageing and diabetes.

13 Greater Copenhagen is part of the transnational Øresund Region, which includes the Skåne Region in Sweden. The ecosystem of the two countries is well-connected forming the life-science cluster Medicon Valley Alliance (MVA), the largest life-science cluster in the Nordics. It gathers Universities, hospitals, and some of the largest pharmaceutical, MedTech and biotech companies in the world. Copenhagen is a world-leader in clinical testing and drug development. The region's strongholds are cancer, diabetes and metabolic diseases, neurological disorders, inflammation, allergy and autoimmune diseases. Within MedTech, the strongholds are disposables, diagnostics, hearing devices and assistive technology. Copenhagen is home to TechBBQ, the biggest startup and innovation summit in Scandinavia.

14 Oslo has a long tradition of research and development in health and has during the last two decades seen an upswing in the number of biotech start-ups. Oslo's science parks, incubators and research facilities are part of a well-developed health startup and life-science eco-system. The health industry's key sectors in the region include oncology, immunotherapy, diagnostic and MedTech. The Oslo Cancer Cluster, Innovation Park and Incubator are the key organisations that gather the entire oncology value chain. Global pharmaceutical companies support start-ups through different collaboration opportunities

as biotechnology and pharmaceuticals, MedTech, or cleantech goes hand in hand with Smart City solutions with the aim to ensure citizens' wellbeing of all ages. Active Healthy Aging is foremost a human-centered effort to create prosperity in cities and regions that results in healthy communities propagating a good life.

Answering the Challenge of Climate Change and Plastic-free Baltic Sea Region

The Baltic Sea regions are putting sustainability at the top of their agenda. There are several regions in the BSR which operate according to a green mindset and which host a world-class research environment. Finland, Sweden, Denmark, Germany, Estonia, Latvia are already generating sustainable solutions for various industries and administrative areas. Poland, Lithuania and Russia are steadily working towards creating opportunities for innovations with sustainability as a development focus. BSR cities are preparing and implementing action plans to adapt and mitigate climate change based. This means linking and upgrading infrastructures, technologies and services in key urban sectors (transport, buildings, energy, ICT) in a smart way which will improve the quality of life, competitiveness and sustainability of our cities. We can find this is an aim in several high-level cross-regional initiatives, i.e. in the Cities Science Initiative (CIS), or the Global Covenant of Mayors for Climate and Energy.

Today 78% of European citizens live in cities and 85% of the EU's GDP is generated in cities. Already today cities generate 80% carbon dioxide emissions. Many European cities are forerunners in the much-needed transition towards a low carbon, resource-efficient and competitive economy.

Sustainability is so much more than a buzzword in most BSR regions. Finland, for example, aims to transform the country into a "socially, economically and ecologically sustainable society by 2030". It has been a long-term commitment to sustainable development, and it is starting to bear fruit. According to a recently published UN voluntary agenda review from the Finnish Prime Minister's Office[15], the country is close to achieving many of the United Nations' 17 Sustainable Development Goals (SDGs) and is increasing its efforts with its goal of becoming carbon neutral by 2035.

On a global scale, five of the top ten countries in the Energy Transition Index 2020 are from the Nordics. All Scandinavian countries and Finland are represented with Sweden in the lead. The 2020 Energy Transition Index by the World Economic Forum[16] compared the energy sectors of 115 countries in terms of their readiness to adopt clean energy to meet climate targets. As Finland is one of the leaders in the transition from fossil fuels to more sustainable energy sources being ranked third after Sweden and Switzerland, we can briefly look into what this means.

Finnish regions work intensively together with businesses in order to enhance the opportunities for industry to do its part in tackling the climate crisis. This is done by adopting sustainable resource management practices driven by climate awareness. 2020 marks six large Finnish corporations among the Corporate Knights' Global 100 list of the world's most sustainable companies, together with five Danish corporations and three Swedish corporations. Two Danish corporations and a Finnish one are among the top three, while nine Nordic firms are among the top 40.[17]

While renewable diesel produced by Neste produces up to 90 % less greenhouse gas emissions than fossil diesel, inspiring planet-friendly solutions are emerging. Along established businesses also Finnish cities put sustainability into practice. The City of Lahti, 90 km north of Helsinki, for example received the European Green Capital Award 2021[18], and is among the many Finnish cities at the forefront

15 https://sustainabledevelopment.un.org/content/documents/26261VNR_Report_Finland_2020.pdf

16 https://www.weforum.org/reports/fostering-effective-energy-transition-2020

17 https://www.corporateknights.com/reports/2020-global-100/2020-global-100-ranking-15795648/
Danish companies, Orsted (1st rank), Chr. Hansen Holding (2nd rank), Novozymes, Vestas Wind Systems, and Novo Nordisk; Finnish companies, Neste (3r rank), Outotec, UPM-Kymmene, KONE, Metso, and Kesko; Swedish companies, Ericsson, H&M Hennes & Mauritz, and Skandinaviska Enskilda Banken.

18 https://ec.europa.eu/environment/europeangreencapital/winning-cities/2021-lahti/

of urban sustainability. What positions Lahti among the five most forward-thinking European cities, is the city's app-based trading scheme for personal traffic emissions, as well as its innovative solutions for waste management and water conservation efforts.

Nordic universities are also key actors in contributing with solutions to global challenges and contribute to social, environmental and economic wellbeing. The Impact Ranking by Times Higher Education which assesses 768 universities against the United Nations' Sustainable Development Goals (SDGs) has taken note of actions taken by several Nordic universities ranked among the top[19] of those committed to realise the UN's SDGs. The contributions of scientific research to sustainability solutions plays a crucial role in the regional ecosystem producing for commercially viable solutions provided by industry and universities of the BSR can build on the eco-system which is already in motion. Universities in the Baltic Countries and in St. Petersburg are increasingly engaging in multi-stakeholder collaboration.

Also, the involvement of the national research institutes needs to be noted in the field of sustainability and climate change, as synergies are created regionally as well as cross-regionally. As an example, innovative material which can be used similarly to plastic but is 100 per-cent environmentally friendly and recyclable is developed by VTT in Finland. This research is focussing on finding solutions to the global plastic waste crisis. Hence, the development of viable sustainable alternatives to traditional plastics, especially those used in packaging, is one of the priorities, in collaboration with local, regional, and inter-regional industry, such as Arla Foods, Paulig and Wipak.

The best practices in the Baltic Sea Region can be the basis for other regions to develop actions for upgrading their Smart Specialisation integration of climate related priorities. Similarly, the constant developments through Smart City innovations across all BSR countries and Smart Ports in coastal maritime areas and harbour cities indirectly contribute to climate related improvement and circular economy solutions, thus they are part of the realisation of SGDs in the regions.

Implementation of innovations is enhanced when regions and actors in the Baltic Sea develop partnerships among each other as well as at EU levels. The actions developed in collaboration can lead to local and inter-regional action plans that serve as a relevant resource for diverse BSR partners to develop their own plans more efficiently when adapting the focus to their regional needs.

This can be done by addressing different areas of the urban settings, e.g. the building stock, energy systems, mobility, climate change, water or air quality as activities in these areas are expected to have profound economic, social and environmental impacts, resulting in a better quality of life, competitiveness, jobs and growth.

Answering the Climate Challenge through Circular Economy

Circular economy has been identified as one of the important pathways to reducing the effects of climate change yet at the same time maintaining economic activities and increasing economic, social and environmental capitals.

The major approach offered by circular economy is being restorative and regenerative. This builds on rethinking waste and finding synergies between economic actors and regions. It also requires system-wide innovation, since such approaches cannot be embraced by actors in isolation.

The European Commission has established an ambitious agenda to transform the EU economy into a circular one. Circular economy offers significant advantages in addition to the environmental benefits of reduced carbon emissions, or cleaner production. It includes larger economic profits and social advantages, such as healthier living and the creation of new jobs. Transition to a circular economy requires an entirely new way of thinking, as well as a new approach to process and product design.

19 https://www.timeshighereducation.com/rankings/impact/2020/overall#!/page/0/length/25/locations/SE/sort_by/rank/sort_order/asc/cols/undefined

A transformation from a linear to a circular economy does not only enhance resource efficiency, but offsets losses in the labour market e.g. due to automation and secures gains in employment through new jobs. Therefore, several initiatives in the BSR have been directed to promoting circular economy through cooperation in the region. These include the European Union Strategy for the BSR (EUSBSR) and the Council of the Baltic States (CBSS). Together they have established that challenges are best solved when working together. Most importantly, through cross-regional cooperation a more balanced development among BSR territories is also achievable.

Circular economy covers all aspects of human behaviour and operations. The need for circular solutions in all aspects of society has risen in awareness in the BSR. Such solutions are recognised to affect several urban challenges beyond waste management. They encompass consumption, production, industry, and urban planning to mention a few areas. As only a few percentages of the original product value are recovered after use and the Baltic Sea carries the consequences of the environmental burden, a change of course from linear to circular is urgent in the BSR.

In concrete terms circular economy affects the cycle from production to consumption, and tackles waste management by creating a new market for secondary raw materials. Circular economy maximizes the use of materials and retains their value for as long as possible. A circular economy is based on the use of services and intelligent digital solutions, and the design and pro-duction of more durable, repairable, reusable and recyclable products. Waste is regarded as a valuable resource. Products are shared, leased or rented, rather than owned by an end user. Smart City solutions can put this into effect.

As a societal framework and economic approach, a circular economy assimilates the opportunity to integrate the 2030 Agenda SDGs in all aspects of urban daily life. As demonstrated in the Circular Baltic 2030 report the BSR can showcase regions that promote circular economy solutions not only for realising resource efficiency, but also for attaining social benefits in several aspects. The report also suggests that “a shift towards a more circular economy will be crucial for the region’s possibility to meet the United Nations 2030 Agenda and its SDGs”.

As circular economy has the potential to solve the world’s mounting waste problem, it can minimize negative effects on the environment, and increase system efficiency. These aspects are included in the Agenda 2030 and its SDGs but achieving these goals will be the result of including the SDGs as a framework affecting everyday behaviour and attitudes. Achieving SDGs will be the result of cities designed with circularity at their core, which this goes hand-in-hand with social goals and business opportunities.

While some countries in the BSR are recognised as frontrunners, collaboration is especially relevant for balancing the level of pollution in the Baltic Sea. Transition requires a determination to collaborate. Challenges include making the internal, regional and cross-regional business case for circular economy, updating antiquated public policies to promote circular strategies and educating consumers about the merits.

The Baltic Sea Region includes a number of countries which have included measures towards sustainability in their strategies and are considered to be amongst the best positioned to deliver on the 2030 Agenda and to reach the SDGs, including the global Paris Agreement on climate change and the New Urban Agenda. Therefore, pilots in circular economy solution in the BSR can continue to offer good examples and introduce best practices to support a circular transformation.

Some examples of innovative circular practices are incorporated in Smart City innovations that transform management of waste and resources and reshape attitudes of consumers and citizens. These examples can be found in the pilots of several of the BSR regions represented in this study. While regions like Helsinki-Uusimaa, with cities expediating the carbon neutral agenda stand out as internationally renowned examples of how the circular transformation already is advancing, regions are at different stages in acquiring circular economy competencies in the BSR and therefore may need to increase concrete pilots on circular economy.

The need for more knowledge and inspiration is still necessary for a circular approach to be integrated across sectors, at different levels, and as the core of sustainable development in the BSR.

Pilot activities that inform this study were targeted to increase awareness of the partners and to get the BSR regions and cities to accelerate the desired change towards circular economy. Change can be accelerated by getting the latest knowledge and providing access to best applications through cross-regional collaboration. In addition, regions can benefit by participating in the European Circular Economy Stakeholder Platform jointly launched by the Commission and the EESC. The Platform is a hub gathering knowledge on circular economy and a place for dialogue among stakeholders.

The need is evident to work in co-operation with many actor groups across society to develop a circular economy. However, circular economy is an excellent example of a theme on which BSR inter-regional region alliances or, on a wider scale, European partnerships, can accelerate implementation of strategic priorities. Businesses, public administrations, research organisations, start-ups and the media are among the stakeholders that by working in collaboration can fast-track circular economy in society. An estimate of what this change may mean in Finland is that by 2030, the added value provided by a circular economy for Finland's national economy could be at least 3 billion euros per year.

Answering Urban Challenges Through Smart Cities and Smart Ports

In a similar way to circular economy the Smart City is a cross-cutting issue. Therefore, it is crucial to develop a good understanding of the relation and linkages of all the different urban dimensions and actors. The main target of Smart City and Smart Port as a group of activities is to act as a cross-sector framework, identifying and disseminating best practices helping regions to tap into the growth opportunities offered by the Smart City concepts.

About two thirds of the population in the Baltic Sea Region lives in urban areas and the number is expected to rise. The high use of resources in cities calls for sustainable development of urban areas. This requires new, efficient, and user-friendly technologies and services, in particular in the areas of energy, transport and ICT.

The European Commission reacted to the international Smart City movement in 2012 by setting up the European Innovation Partnership on Smart Cities and Communities (also known as the Smart Cities Initiative) as a cross-cutting activity.

Though best practices created, collected and analysed with Smart City projects function as a basis, as useful for regions to develop actions towards upgrading Smart Specialisation implementation and development of opportunities for innovations shared among the partner regions and actors in the Baltic Sea and EU levels. The actions developed can serve as a relevant resource for project partners to develop their own plans adapted to their regional needs. With the help of these activities some partnering regions can develop their roles to become strong, not just in the BSR but also on a European scale.

Baltic Sea Regions conducted cross-regional pilots in Smart City development, including innovative digitalisation to empower life in the city and services development for citizens and businesses, i.e. including traffic, transport, and logistics.

The European Capital of Innovation Award iCapital criteria and challenge provide an easily adoptable Smart City principle. It is interesting to note that in 2017 six out of the ten finalists were BSR region cities.

Therefore, the Smart City pilots can be recognised with the following elements and activities that aim at:

- Experimenting innovative concepts, processes, tools, and governance models,
- Functioning as a testbed for innovation,
- Engaging citizens in the innovation process,
- Ensuring the uptake of the ideas provided of citizens,
- Expanding the city's attractiveness to become a role model for other cities, and
- Empowering the local ecosystem through the implementation of innovative practices.

Smart Cities as a term and concept has been a valuable for many years, allowing for a shared frame of understanding and a powerful international agenda for developing and testing technological solutions and new partnerships for urban development. However, the Smart Cities concept is also ambiguous, and it can be argued that it is so broad that it covers everything and therefore nothing, which makes it difficult to operationalize.

As an example of the diligent step-by-step local efforts in numerous municipalities in the BSR we can the work required from the municipalities: to constantly explore, test and implement (IoT, AI) solutions, e.g. by installing sensors in waste bins, setting up IoT networks in municipal buildings, measuring the indoor climate in multiple buildings, or counting cyclists on the local mountain bike routes. The work is often driven forward by citizens and start-ups as much as by public authorities Sparring with other municipalities that have tried similar solutions is done formally and informally. [20] Alternatively, the activities can also be initiated by local suppliers and consultants, eager to establish test solutions, representing local knowledge and entrepreneurship. This describes how change and innovation has been emerging in several cities and port areas around the BSR.

In Annex II concrete example of cities that are using the Smart City and Smart Port theme to innovatively transform the approach to regional development are showcased. The pilot activities related to the Smart City vision of the city of Aarhus, Tallinn and St. Petersburg for Smart City, and Riga, Klaipeda and Kymenlaakso for Smart Port, are a good example of how cities and regions are engaged in collaborative activities to reach an inclusive and sustainable transformation.

2.4 Thematic Analysis

Nordic policies are designed and executed for the explicit universal goal of creating a society of well-being for everyone.

(Anu Partanen) [21]

As described in previous chapters a fundamental challenge is how regions in the Baltic Sea Region can provide solutions to grand societal challenges. This includes contributing to citizens' wellbeing, promoting youth networks and active healthy ageing, exploring smart and inclusive use of technology, and confronting climate change. A strategic goal for the entrepreneurial cities and regions in BSR is to attract relevant businesses inclusively and to do so by applying cross-regional collaboration in policies and actions.

Our study analyses the actions taken by the BSR regions participating in the Smart-Up BSR project. Our intention is to unwrap from the observed pilots what capacity gaps the regional actors are facing.

Strategic capacities can set cities and regions into motion to engage and develop their local industry strategies while addressing them cross-regionally and internationally and at the same time tackling shared societal challenges.

We begin by establishing what are the targets, policies and methods that lay the ground for regional and local pilots to be launched. Targets

20 Some Smart City activities in the Baltic Sea Region: (Tallinn) https://www.tallinn.ee/ee/eng/tallinovations/Open-the-City-Application, https://www.facebook.com/mitte.tallinn/ and dashboard.tallinn.ee; (Riga) https://www.vefresh.com/home; (Aarhus) https://www.smartaarhus.eu/node/196 and https://www.smartaarhus.eu/node/196; (Denmark) www.opendata.dk; (Helsinki) https://hri.fi/en_gb/ and https://forumvirium.fi/en/air-quality-matters-join-the-air-quality-troops/; (St. Petersburg) http://bertholdcentre.com/ and https://www.artplay.ru/; (Sweden) https://en.viablecities.se/

21 Anu Partanen, The Nordic Theory of Everything, 2017, p.240.

are guided by a focus that aims at economic development policies through specific methods. By means of the effectuating processes of change management and capacity building in the thematic analysis, targets, policies, and methods have been evidenced as outlined in the following framework:

This set of strategic undertakings have served policy makers in their challenge to manage change towards achieving results locally. The reference framework represents competitive landscapes that integrate different modes of innovation as well as various knowledge bases in local-global interaction.

In the represented BSR regions a review process was launched in which the responsible organisations prepared, conducted, and then reflected and evaluated their pilot actions. This included a reflection on the how to concretely adopt in their region innovation activities within the Smart Specialisation strategic themes.

Innovation camps were used to take part in cross-regional group activities around Circular Economy and Boosting Entrepreneurship, Smart City innovative solutions development, Active and Healthy Aging eco-system mapping as well as to develop an integrated innovation support infrastructure by engaging SMEs in the open innovation process. Collaborating around boosting innovative entrepreneurship ecosystems in regions means can add the bonus of creating opportunities for young entrepreneurs and youth start-up.

The joint intra- and inter-regional activities which have proven to be beneficial in boosting pilot related actions include shared experiences in the process of

- mapping thematic ecosystems and the achieved results in order to revise planned actions,
- conducting peer-to-peer reviews and raising awareness, and
- training in order to build competencies.

Table 2 Targets/Policies/Methods framework for regional change management

TARGETS/POLICY/ METHODS	Goals towards	Focus on	Methods for	Policies for
Smart Specialisation (policy for economic transformation)	shared and complementing expertise that ensures growth	local priorities and constantly creating new strengths	triple and quadruple helix	supporting exchanges, revisions, updates
Smart Specialisation (as a means for SDGs implementation)	- build up for future global and local challenges - ensure stability	aligning SDGs and into a coherent local and regional strategy	regional integration by research, industry, civil society	societal change readiness for unknown yet promising future
Entrepreneurial Mindset	improvement driven by experimentation	- organisational change management - competencies for enabling and monitoring action	support of wide range of mission-driven local actors and international partners	- enabling action - monitoring results - supporting creation of new solutions
Evidence-based Policy Making	- provide better results that can be followed-up - allow easier adjustments - give a tangible framework to build on	transparency communication data support	public actors and industry collaboration based on data	- enabling multi-level and multi-methodology data use

The assessment of the pilot actions was done in eight regions of Baltic Sea macro-region: in Denmark-Aarhus, Estonia-Tallinn, Finland-Helsinki-Uusimaa, Finland-Kymenlaakso, Latvia, Lithuania, Poland, and St. Petersburg. Results and key reflections by individual regions are summarized in Annex I. The organisations and institutions participating in the Smart-Up BSR project pilots have assessed their work from the perspective of the importance of the pilot for their region, what role their organisation has played during the implementation, and how regional strategic actions towards economic transformation have been systematically implemented in their pilot activities.

Results of the Analysis

In order to go deeper into the reality of strategic implementation at local and regional level we need to acknowledge the intense work that is being done by regions and cities.

Regional actors may not all be able to resort to qualities and competences necessary for an entrepreneurial approach to regional development led by innovation. Instead, when lacking the tools to for an entrepreneurial approach, regions follow traditional paths which tend to apply digitization to governmental operational issues but are less equipped to push through an entrepreneurial approach.

The following assessment can assumingly be shared by most municipalities in the BSR. When implementing evidence-based approaches "… municipalities have doubts about which direction to go, what technologies to focus on, where to buy the right equipment, how data is best processed and presented, and which technology providers are the right ones to collaborate with. The experience across public authorities is such that there is still a great task - political as well as practical - in describing potentials, allocating resources and coming from pilot project to large scale solutions". To realise this and understand how to face this challenge cities need actions. However, it is through actions that impact is created, and consequently new elements of governance are introduced, of urban challenge dialogues are conducted, technology solutions are tested. Also, through actions stakeholder engagement is leveraged, of business collaboration is orchestrated, and impact on citizens inclusion is created, as well as capacity is being built.

Strategic Diversity and Strategic Alignment

A closer look at pilot implementation has revealed how each region differs while the goals being implemented are common. Regions seem to undergo a process of strategic alignment, i.e. aiming at fulfilling selected SDGs, while operating within their particular administrative and territorial set up. Results can vary based on the region's administrative nature. However, with reference to cross-regions collaboration each region has explicitly stated that they have learned from others. The result of the shared pilots was that events in neighbouring regions and the environment surrounding a region can significantly influence the impact of the resulting strategies.

Nonetheless, despite a favourable outlook towards cross-regional and international alignment the local implementations can diverge. There are differences between a higher-level strategic orientation and its realisation in ground-level project activities. Vice-versa, with their pilots some regions could be moving in the other direction from practical action to high-level policy making. Interestingly, in the pilot executions we could observe how some locally designed solutions could be highly innovative in fulfilling high level transformative goals. Similarly, national pilots were able to contribute to local economic and inclusive transformation. Therefore, we can say that the landscape is varied, and transformation happens through multiple attempts to engage actors in actions that increase the opportunities to learn and build capacity.

Two examples in the Central Denmark pilot point to two sets of actions addressing different needs and requiring different sets of competencies: *Civic Tech* and *GovTech*. *Civic Tech* enhances the relationships between the people and public authorities and in other words provides a tool to build bridges between the citizen and the municipalities. On the other hand, *GovTech* is the public institution's use of radically new technology

to improve the delivery of public services through increased efficiency.

While *Civic Tech* technology enables to include citizens in the decision-making process, to make their voice heard, and it allows the sharing of data about the city, *GovTech* complements the traditional technological infrastructure with emerging technologies. Both allow the municipality to utilize smart city solutions, i.e. digitalization, and welfare technology as well as to include co-creation, public hearing platforms, open data, living labs and citizen science. As different Smart City pilots they rely of different disciplinary knowledge and orchestration capabilities.

With these two perspectives of technology development in mind and based on intense cooperation the pilot organisers concluded that further improvement is still needed to "work towards more coherence as well as community thinking and common direction". Capacity building is in constant process and given the complexity of urban challenges regions need to be constantly testing the actual implications of community thinking and acting. This stands for the realisation that regions are facing the same challenges and that by working together they can make the resources available go further.

Entrepreneurial Communities

Community thinking is a catalyst for action following an entrepreneurial mindset and fostering collaboration between universities and municipalities, businesses and citizens. When observing the city of Tallinn, we find a combination that demonstrates an entrepreneurial approach. Tallinn City defines its goal of developing a Smart City hub in terms of exploiting RDI combined with the practical use of new solutions and attracting companies. This is proven by a strong ICT sector, a lively start-up scene, competitive tradable services, and a trustworthy internet and web environment as identified by the pilot participants as the main strengths of Tallinn and the surrounding region.

Yet, to leverage on these strengths the pilot builds on the efforts of Tallinn City to overcome internal weaknesses. Urban challenges that may appear to be "related to the size, scale and structure (population, economy, resources) or limited attraction in the context of growth & globalisation", can be transformed into successful entrepreneurial action-taking by a push for change in domestic policy. Activities were launched to examine how to expand a community identity that changed awareness. It was noticed that an overlooked tendency to build policy on contraction and enclosure should be reverse and replace by strong collaborative ties in the BSR, to enable a transition and to intensify collaboration both internally and cross-regionally.

The result of clarifying strategic action by intensifying domestic processes in the City of Tallinn towards a more entrepreneurial community and participative identity is expressed in a reflection by the pilot organisers. They recognized strategic action in the pilot as an opportunity to establish contacts with different BSR partners, and in addition, surprisingly, establish closer contacts between the City government and University of Technology.

In regions where port-related activities and business have a long tradition, - such as Finland´s Port of Hamina-Kotka, or Lithuania's Klaipeda Port, or Gdynia Port in Gdansk -, valuable know-how and relationships have been accumulated for decades. When thinking of the regional ecosystem´s role in supporting innovations in this type regions, what stands out is that "all the relevant innovation actors know each other quite well. The communication and contacting between actors are smooth, fast and straightforward."

This joint practice is an advantage for increasing collaboration. For example, this year, the Lithuanian maritime cluster and the Polish organisation "Gdansk-Gdynia-Sopot Metropolitan Area" as well as several business partners and incubators are partnering for a joint Baltic See Region Hackathon the "Portathon Baltic 2020".

The lessons learned in the port pilots point to competence needs to be filled essential for pilot planning and organising collaborative and open innovation activities. Successful multi-stakeholder actions resulting in innovative sustainable entrepreneurship including circular economy solutions for new port related businesses, have a community building impact.

These planning and orchestration needs are not limited to smaller and specified regions. Even with successful pilot actions in larger hubs like e.g. Helsinki-Uusimaa, Berlin-Brandenburg, or St. Petersburg capabilities are continuously evaluated. In general, all participating pilots confirm that the engagement of a large number of stakeholders when done successfully presented several concrete ideas on how to enrich and enliven their area adding the bonus of a double sense of belonging: on one hand the prospect of a prosperous local future, and on the other hand, the shared build-up of expertise of cross-sector, or cross-regional action.

Cross-Regional Balance Capacity

The piloting exercises boosted the use of Smart Specialisation strategy in concrete ways. The interactive tools gave an excellent opportunity to train competences for predicting future scenarios, pinpoint specific development needs, develop strategic foresight thinking and intensify co-operation and interaction with region´s different innovation actors. From the perspective of smaller regions and port areas lacking regional competences could be complemented with collaborating especially with project partners from port cities.

In addition, capacity building was also a main focus from the perspective of pilots facilitated by national entities. In Latvia for example, the Ministry of Education and Science (MoES) participated with expectations directed towards better solutions for closing skills gaps. Capacity building needs stretched from better management of water resources, to improved education and links between the academic and the business communities, to sharing interdisciplinary urban challenges approaches such as circular economy.

By participating in the innovation camps Smart Specialisation ministerial experts gained insights and knowledge based on concrete societal challenges and their impact on the outcomes to consider. MoES pilot organisers also observe that in the regional context "Sector specific information regularly needs to be updated and monitored." This means "…providing updates on challenges and opportunities to achieve better and more accurate focus and ensure engagement with all the stakeholders (policy makers, R&D sector, entrepreneurs, students and general public)." Similar to the Latvia MoES perspective there is a clear understanding among actors in several BSR regions that "the future impacts for the Baltic Sea Region are: Cooperation for new project applications (e.g. in circular economy sector) and networking, new contacts".

Evidently, in some instances cross-border cooperation is already integral to the activities of several BSR regions and is an important priority. Such collaboration is essentially based on the idea that we are stronger together. Research networks and other partnerships in the Baltic sea region can continue going forward and benefit from interpersonal, cross-organisational and cross-regional relationships that shape actions of high value for the future. Nonetheless, each pilot showed there is a need to increase competencies in using tools to share progress, make smart and innovative solutions widely available, and create a community of mutual capacity building.

These elements ensure that results achieved in one region can have a wider impact at the BSR macro-region level. For example, new approaches help to prioritise competences in human, social, and financial resources, and therefore regions could be involved in larger and more wide-ranging projects. Alignment within the BSR macro-region is to be considered the biggest precondition for favourable business opportunities in each individual region.

Through the pilots, regions could observe how pan-regional development can be facilitated through meso-level strategies, e.g. Baltic Sea Region Strategy. A joint community of BSR regions can device policies that provide access to talent within the region, through the EU, and beyond the EU and as the Tallinn pilot concluded, trade barriers can create opportunities in the context of balancing increasing competition from Asia.

The cross-regional advantage was also felt in the AHA-network mapping exercise led by the city of Helsinki. The mapping of networks in different BSR cities fosters both local and cross border co-operation in the Baltic Sea Region. BSR regions will benefit of new visions and collaboration possibilities on the AHA theme (see pilot description and results in Annex I).

Concluding Remarks

Commenting on Smart Specialisation place-based visions and leadership Sotarauta (2018) raises the point that Smart Specialisation changes the discussion in the agenda of regional development. Smart Specialisation is about "not only policy formulation, implementation and evaluation but also pooling scattered resources, competencies and powers to serve both shared and individual ambitions" (p.191). These two powers, the shared power and the individual power, are equally crucial for achieving results and invite us to see Smart Specialisation formulation and implementation in a double light. In order to realize each region's selected Smart Specialisation priorities, it is of benefit to scale Smart Specialisation collaboration to the Baltic Sea Region as a whole, which leads to creating a promising pan-BSR process.

2.5 Summary

> *Indeed, a great deal of the work of deep social change involves having debates during which new stories can be told to replace the ones that have failed us.*
>
> (Naomi Klein, 2015, p.461)

In chapter one and two this study has advocated for cross-regional capacity building as the strategic and actionable impetus that is needed for the Baltic Sea Region to solve its urban challenges and transition to a sustainable entrepreneurial macro-region with the best quality of life. We have analysed Smart-up BSR project pilots that have followed the principle of the multi-level governance by bringing together experts, city practitioners, regional and national representatives in charge of Smart Specialisation. They have participated in innovation camps and workshops that created interactions and alignment between all scales regional, municipal, and other stakeholders. Furthermore, representatives of pan BSR institutions, EU level organisation, JRC and CoR have been involved in the capacity building process.

Therefore, as a result, the BSR partner regions have reached aspects of collaboration with multi-level actors from cities, regions, BSR and EU level which provided new insights. Some elements of the local appropriation of learnings with regard to multi-level governance collaboration has been achieved within the frame of specific thematic pilots within the four themes of Active Healthy Aging, Climate Change, Circular Economy and Smart City. The result is a holistic understanding of the need of strategic capabilities to develop an integrated implementation of specialisation strategies and roadmaps.

This study has analysed the actions taken by the BSR regions participating in the Smart-Up BSR project, the pilots' paths to experimentation, prototyping and implementation. What we found led us to understand the need for instruments fostering capacity building.

To achieve an_economic transformation that includes becoming smart and sustainable a city or region needs competencies and instruments for active engagement and collaboration of all stakeholders. When the ambition is a future inclusive, green, and entrepreneurial Baltic Sea macro-region the appropriate strategic instruments are crucial. After a brief analysis of the regional pilots we present a set of strategic capacity building tools that help regions and cities to focus on implementing the changes leading to smart sustainable and entrepreneurial actions.

The prospects of increasing jobs opportunities within the Smart City and circular economy sectors also highlight the need for more competencies, as well as focused collaboration if we are to improve the abilities of regions to exploit new technology to a new level and achieve their growth potentials.

From a perspective of coordination, there is a strong need to build up knowledge and skills so that the public sector can facilitate collaboration and orchestrate the development in a desirable direction to achieve the anticipated benefits.

If we conclude that macro-region cross-regional collaboration has a key role in successful implementation this prompts us to look for the appropriate instruments that make a transformation possible and lead to a sustainable and entrepreneurial Baltic Sea Region.

Based on the analysis of the regional reflections the following tools for capacity building were identified as significant: The Regional Strategy Diamond, the Organisational Innovation Competency Set, and the Innovation Camps. These tools may be used individually, in combination, or accompany other sets of tools, depending on the regional needs. As we will present in the next chapter, the practical implementation of these collaborative and capacity building instruments has a strong impact on Smart Specialisation and City Science as frontrunners for action at a BSR macro-regional level.

3 STRATEGIC INSTRUMENTS FOR CAPACITY BUILDING

3 STRATEGIC INSTRUMENTS FOR CAPACITY BUILDING

There is a mismatch in the need for belonging and the actual sense of belonging, there is mismatch between meaning and purpose.

(Andersen and Björkman, 2017, p. 357)

Because regions strive towards promoting a sense of belonging connected with meaning and purpose, resulting in a good life for their citizens, they need to turn strategic priorities into successful action leading to change. After analysing Smart Specialisation pilot projects in chapter two this chapter directs the attention towards a set of strategic capability building instruments for the implementation of strategic action. Strategic capacity building is valuable for rendering the process of strategy implementation impactful towards economic transformation.

The combination of societal and economic challenges motivates us to look for strategic instruments. We are looking for leverage for the implementing for regional strategic priorities by emphasising balancing levels of action. The practical outcomes of collaborative and capacity building activities aiming at regional, and subsequently cross-regional balance have a strong impact on regions becoming leaders in matching societal capital and economic strength.

By relying on balance several layers of implementation can be achieved simultaneously, especially if attention is given to capacity development as part of the strategic process. Strategic capabilities need to be considered in the light of how efficiently they can orchestrate multi-layers stakeholder engagement and thereby achieve balance between priority spearheads and horizontal impacts. This also implies cross-issue approaches that balance strengths not only within regions but also between larger science hubs in volume and other smaller BSR regions.

Need for Strategic Capacity Building Instruments

By observing concrete thematic actions, the regional pilots' analysis in the previous chapter shows how, inevitably, regions constantly need to come to grips with in how people - officials, professionals, individuals - respond to changes in the economy, in the market, in technology, and in society. Fundamentally, regions need to address in practical ways the complexity surrounding place-based human capital and innovation eco-systems.

Based on the findings of the regional pilots we present a collection of instruments which develop collaborative capabilities for balancing regional innovation ecosystems enhancing economic transformation. We base our observations on the processes that some of the Baltic Sea regions have undergone to leverage on their strategic strengths in an efficient way.

Regions benefit from utilising Smart Specialisation in practice and cross-regionally. We can look at two examples. First, the cross-state innovation strategy (innoBB) embracing both the German capital Berlin and Potsdam in the neighbouring state of Brandenburg. The joint InnoBB strategy is conceived to combine the efforts of two otherwise separate federal states, and it also delegates a significant part of the implementation to industrial clusters. This constitutes a dynamic evolution of communication and balance between key local partners. The challenge is how to turn this institutional cross-regional frame into approachable and inclusive action utilising citizens' participation. Another example is a Finnish local pilot linked to the effort to map the local Active and Healthy Aging network. The action could however only be approached collaboratively and

was expanded cross-regionally into mapping corresponding Nordic and BSR health and medical networks. These two examples show the multi-layered perspective of societal and economic transformation. To be actionable it requires capability instruments for balanced execution in innovation eco-systems. From a regional development point of view close collaboration in science-driven innovation, in practical terms, can only be leveraged to the full if the inclusion of the regional and cross-regional collaboration, and the inclusion of the civic population and its participative role are taken into consideration.

Interaction between municipalities and different science and research institutional strongholds is important for upgrading and diversifying technologically locally grounded industries. It is possible to link lower performing regions to global high-tech sectors and larger competence centres as can be found in the Helsinki-Uusimaa region where the cities of Helsinki and Espoo, with distinct educational and research institutions, expand the innovation potential to citizens services. While the region has a significant distribution of corporate presence and government institutions, the regional strategy takes into account the differences of knowledge nodes and spaces that specifically impact innovation locally in each municipality's socio-economic as well as educational and research environment. This development has been observed in every regional pilot and regional effort to implement Smart Specialisation strategies.

Tools are necessary to leverage the agglomeration of scientific and technological knowledge and expertise, and to engage the research–industry collaboration into local innovative applications. This is an important factor for projecting solutions to the global market and for realising the concrete local potential.

To expand innovation eco-systems in a meaningful manner, and thus obtain new solutions transforming the economy of a region, strategic instruments help for creating and implementing change collaboratively and in a balanced way. While two major concepts provide the backbone of Smart Specialisation – first, entrepreneurial mindset for a regional entrepreneurial discovery process, and second, evidence-based policy making – this study introduces strategic instruments for securing a successful and balanced implementation through regional innovation ecosystems.

Strategic Capability Instruments

Smart Specialisation processes relying on evidence-based methodologies have proven useful in addressing institutional complexities. The strategic capability instruments presented here intend to eschew coordination failures by working with balance and thus increase the effectiveness of regional implementation measures.

The relevance of strategic instruments is to put in motion productive strategy processes and devise relevant strategic action. Our interest lies in the capabilities needed to initiate strategic implementation and reflect on the outcomes, to be able to produce relevant adjustments. It is important that to leverage on strategy regions maintain the focus on active implementation and on engaging revisions. Therefore, we propose to have a closer look at the following strategic tools for capacity building: The Regional Strategy Diamond, the Organisational Innovation Competency Set, the Innovation Camps.

Innovation actors may find these instruments helpful to establish what is required in order for transformation to actually be tangible. They may use these instruments in answering questions such as 'who are certain measures serving', or 'who are the driving actors that need support'.

In short, each instrument has the potential to aid regional actors in the endeavour of understanding the dynamics of the region towards growth and stability as well as directing actors to new methodologies and processes. Regions and cities can apply any of these instruments to regional development strategically as single or combined tools towards evidence-based policy making that benefits from an entrepreneurial mindset and from innovation-led regional ecosystems.

In the following, threes aspects of strategic action and implementation are condensed in the three strategic capacity building instruments for regional transformation. The two first instruments, Regional Strategy Diamond and Organisational Innovation Competency, serve two facets of implementation: strategic balance and strategic capacity building. The third strategic instrument, Innovation Camps, serves both facets.

3.1 Regional Strategy Diamond

The plea for creative bureaucracies … to allow and foster possibilities for transdisciplinary cooperation cannot be echoed enough.

(Caroline Nevejan, 2020, p. 42)

The Regional Strategy Diamond introduced by Tukiainen and Hongisto (2020) for an efficient and effective Smart Specialisation strategy process is a valuable tool for operationalising evidence-based regional analysis for strategy revision and implementation.

A Tool for Place-Based Challenges

Place-based thinking has gained influence in EU policy frameworks in the attempt to emphasize the territorial context of evidence-based policy making. An explicit goal of evidence-based policy making is to operate close to the local action and to serve the territory in an appropriate and sustainable manner.

Though it is through local changes that every economic transformation takes place in practice the place-based approach is not simply about an emphasis in promoting a locally centred, bottom-up approach. It is rather about balance and optimal use of local scientific expertise, knowledge networks, and best research-industry practices. These elements secure an evidence-based approach to policy making when a balance between them is achieved.

Smart Specialisation makes it possible to apply placed-based innovation ecosystems in the regional strategic development processes, yet this requires capabilities for both top-down and bottom-up perspectives to develop and contribute to change management models. These might include concepts such as: collaboration concepts (local and systemic, based on the Quadruple Helix and entrepreneurial hubs); partnering concepts (more targeted participation and partnering at different inter-regional levels and European level); strategic instruments concepts (this may include i.e. organisational innovation, public procurement, innovation orchestrated through innovation hubs). When utilizing the Regional Strategy Diamond as an instrument for implementation the balance between these concepts can be regularly adjusted.

Based on the collaboration with the Smart Specialisation organisations in the countries in this study, we can observe that local work and the place-based approach can be implemented more pervasively. In addition, there is a need to foster cross-border cooperation in order to enhance innovation capacity locally and to capitalize on shared expertise and knowledge towards creating a sustainable economic transformation locally and cross-regionally.

A Tool for Daily Work

Currently, Smart Specialisation is still often seen as one of the many issues local/regional politicians must deal with in their daily work, and amidst short-term concerns perceived as more urgent. Smart Specialisation was considered a long-term issue whereas more urgent immediate measures were seen as primary. Through the monitoring and reflection on Smart Specialisation strategy and implementation by using the tools suggested in this study, and the Regional Strategy Diamond specifically, ways can be identified for a change towards a balanced Smart Specialisation strategy implementation between long term policy making and short-term needs.

As one of the strategic instruments, the Regional Strategy Diamond, supports the efforts to bridge some of the gaps in various levels of communication, competence gaps, and commitment gaps. Organisations leading the implementation and committed politicians can more easily take ownership and have tools for putting RIS3 at the core of their regional transformation. Moreover, the instrument provides tangible action to involve relevant regional, national and European goal setting. This allows politicians

and leaders in a multi-layer governance to function as equally active parties through expertise sharing and project participation in action-related advisory, knowledge building, and steering roles.

Consequently, the Regional Strategy Diamond allows applying evidence-based policy making by means of change management and capacity building instruments which function as a mobilisation of locally active stakeholders to collaborate in a broader, balanced context. This balance can clarify the place-based perspective to participating stakeholders and help also to open up relevant action and practices.

It also should be noted that the Regional Strategy Diamond steers regions to open up to include inter-regional and international layers. While regions can benefit from the tool for balancing local economic transformation, regions operating on their own often make decisions based on limited perspectives. Even pioneering and entrepreneurial regions often find it challenging to integrate what they find elsewhere for inspiration in a balanced way. Capability building tools, and the Regional Strategy Diamond in particular, can save time in conducting the processes that implement, monitor and reflect how stakeholders manage innovation locally, or succeed in leveraging on cross-regional innovation.

The Regional Strategy Diamond angles serve to illustrate that each region has different evidence-based anchor points in creating a strategic balance. Thus, when used locally for an evidence-based regional analysis the regional strategic diamond can ensure the ability and capacity to implement the strategic choices in practice.

To leverage the locally based point of action a place-based and evidence-based process is required, rather than a fit-for-all formula. Thus, the Regional Strategy Diamond functions as an instrument to help calibrating that balance.

The Regional Strategy Diamond

As the Regional Strategy Diamond[22] is conceptualised to calibrate balance, the instrument functions according to the specific angles at different action points in the local process. Just like the starting impulses of each single angle are most efficient if they are evidence-based, correcting the angle movements during the implementation needs to equally be evidence-based and related to every other angle.

The Regional Strategy Diamond has five angles in total: Strategy, Actions, Competences, Competitiveness, and Leadership in Context. The model assumes that each angle drives the process in an equally significant way. The core of the diamond represented by Leadership in Context plays a key role in enabling the other angles to succeed. However, the efficiency of each angle is created by how they link to each other, rather than by the unique performance of each angle.

While facing movement and change from either within the regional environment or from external forces, the connections between the angles are affected. Also, since each of the angles can function towards maintaining or disrupting balance, the connecting links need to balance out those changes. Thus, though strategy is often emphasized as the most crucial activity, strategy creation as content and as communication only represent one angle. Formulating the direction and the priorities the region moves towards needs to be based on other angles like actions and competences, as every angle is equally engaged in maintaining a successful balance through tensions and movements.

Why do regions benefit from a tool like the regional strategy diamond?

For example, the regional strategy diamond helps to focus on and maintain a balance which otherwise may be overlooked. The strategy diamond leads to identifying links and consequences between different angles of strategic regional transformation. Modifications that are

22 While the Regional Strategy Diamond is inspired by the strategy diamond conceived by Burgelman (2008), as a regional development instrument it is an adaptation of work informed by studies on strategy as practice. Tukianen and Hongisto (2020) adopt their regional strategy diamond to serve as analytical tool for the process of regional strategy creation and revision with reference to Smart Specialisation strategy creation.

Figure 2 Regional Strategy Diamond for Economic Transformation

initiated at one angle will affect the performance at any other angle and this will take place in different specific ways for each individual region.

Regional actors have been advised to apply evidence-based policy making in regional development strategy work and for identifying and implementing Smart Specialisation strategic priorities. Often regionally operating stakeholders find it easier to fall back on imitating successful regions. They may perceive it as a risk to put into action solutions that may diverge from general approaches. This may work up to a certain point, nonetheless, simply trying to replicate other successful regions will indeed not yield similar results in every region.

The actions taken relating to one angle, though focussed on that specific angle, need to be directed at creating balance and at reducing imbalances. Examples of the attempted balance would include balance between national and regional priorities, balance by cross-cutting themes, balance between global knowledge and local know-how, balance between research-intensive and entrepreneurial activities, balance between citizens-focused local priorities and global challenges, balance between public sector strategic direction and reliance on industrial clusters, balance between local and external talent, balance between nodes of scientific knowledge and marginal areas, balance between specialisation and diversification.

Who can use the regional strategy diamond and who is it serving?

The stakeholders involved in regional transformation form a broad spectrum of actors. Regions that are developing evidence-based policies need to engage multiple layers of governance to utilise the advantage of the regional strategy diamond. The tool itself brings a large variety of stakeholder to the table always when the angles are discussed. Also, the tool can be used to activate otherwise less for decision making and implementation with transformation in mind. Stakeholders that provide data and statistics will be crucial for establishing the status of each angle and how it relates to the success of the angles in balance. However, the everyday implementation

by regional business actors and citizens needs to come to the fore as validation. This means a broad involvement of public and private sector actors.

Balancing the angles in the regional strategy diamond of a region implies that at some point corrective imbalance has a role, not as a final solution, but as an intentional move which in turn leads to an overall balance. Regionally, this turns out to be a unique process particularly relevant for particular actors in a region-specific environment. The willingness of the people involved to go through diamond process, be it business owners, academics, researchers, industrial innovators, or public sector and societal innovators, and as such it is place-bound and would not necessarily work as a formula to fit all.

How can the tool be used?

Basing the adjustments between angles on a sound analysis for evidence-based regional innovation strategies is one of the advantages of the tool. However, this goes beyond an inward look and does require cross-regional collaboration. The competitiveness angle in fact contains the facet of internationalisation and aspect of cross-region and cross-border activities. An outlook that includes openness is a based on a detailed evidence-based approach to local economic activities and on knowledge of local strengths and opportunities that can flourish within a cross-regional environment.

Fittingly, the regional strategy diamond approach directs the cross-regional dialogue away from attempting to imitate successful strategies implemented in other places. Successful inter-regional approaches are achieved by an evaluation of actions which correspond to the strategy balance of the diamond angles: the angle of strategy, the angle of actions, the angle of competences, the angle of competitiveness and the angle of leadership, culture and context. An explicit goal of achieving balance in the implementation of evidence-based policy making is to secure regional strength not through a limiting inward focus but through a conscious action in piloting systemic transnational partnering. Without a sustainable balance the process of pioneering innovation ecosystems defining the BSR macro-region would not benefit all regions equally.

What does the tool deliver?

Due to the nature of the challenges of collaboration and engagement it is essential in implementation actions to balance every partner's or region's effort into raising the capacity of every stakeholder while leveraging the collective potential. Organisations encounter this need of balancing in local internal development, or cross-regional co-operation, or collaboration of the BSR as a whole. The balance of the angles includes improving opportunities for cross-regional partnering as well as implementation of such established partnering. This can be facilitated even more by integrating the other two capacity building instruments, Organisational Innovation Competency Set, and Innovation Camps.

With evidence-based policy making in mind regions tend to operate too much on their own and are tempted to refer to other regional examples as ready-made successful solutions to be imitated. However, the challenge for each region is breaking the silos and implementing regional innovation ecosystems that ensure a balance which then affects the ability of a region to master its current and future circumstances. This requires consistent high-level political commitment towards evidence-based policy making geared to achieve regional balance. For this the Regional Strategy Diamond tool is a practical aid.

Evidence-based policy making benefits from the Regional Strategy Diamond as it can lead to an awareness of structural challenges in the process of an individual region, and it can highlight the need for transnational cooperation for establishing regional balance. Crossing borders to make better use of existing best practices and change management instruments allows regional institutions to make adjustments that may not have been evident, but which can be achieved when international cooperation reveals optional possibilities.

Appropriating other successful regions' formulas denotes weak ownership and makes it easier for politicians to distance themselves from the results. Using the tool includes evaluating in practice the collaboration with other BSR regions as well as European institutions – such as Committee of the Regions (CoR), the JRC and European top-level experts of Smart Specialisation. The overall

balance makes it easier to add clear political commitment, as well as strategic and operative value. This also allows close collaboration in sharing and disseminating results and learning, in a way that measures balancing elements in the strategy diamond angles and how they affect each other.

3.2 Organisational Innovation Competency

> *"The likelihood of achieving sustainable and inclusive growth depends to no small extent on the way in which the entrepreneurial discovery process is practised, or, more precisely, how collective this process is."*
>
> (Asheim, Isaksen, Trippl, 2019, p. 117)

We believe that answering the challenges that cities and regions face in the current economic and social situation in the Baltic Sea Region specifically, and in Europe in general, includes gaining competitiveness through sustainability and an entrepreneurial mindset. What, then, are the organisational competencies needed for an entrepreneurial mindset and an entrepreneurial discovery process (EDP) necessary to respond to the dynamic and evolving realities of regional innovation ecosystem setting course towards sustainability?

To understand the need of an instrument gathering elements for an Organisation Innovation Competency Set, we first reflect on EDP and governance and management processes as channels that absorb capacity building.

While the entrepreneurial mindset of both the economic and public actors in regional development has been largely considered as an asset that positively affects local economic growth, in the context of Smart Specialisation entrepreneurial mindset goes a step further. Smart Specialisation couples entrepreneurial mindset with a regional discovery process which is used as a tool to facilitate evidence-based regional policy making. EDP requires the combination of local expertise and market knowledge and is primarily designed to create something new out of existing regional capabilities or resources. Before describing the instrument of Organisational Innovation Competency, we need to provide a closer look at the entrepreneurial competence requirement.

In a broader sense, the concept "entrepreneurial" describes cooperation between different stakeholders (entrepreneurs/ companies, higher education institutions, researchers, development companies, citizens associations etc.). The entrepreneurial knowledge involves more than knowledge of science and technology: it includes knowledge of market growth potential and innovation needs. Companies have a critical role in e.g. scanning the operating environment, existing knowledge and know-how, and comparing them to market potential and current competitive situation.

On the flip side EDP may lead decision makers to lean on the local expertise without venturing towards new innovative solution, which could eventually lead to regional path dependency and barriers to innovation (Mäenpää & Lundström, 2018; Mäenpää & Teräs, 2018). In terms of the efficiency of EDP, Kroll (2016) analyses 179 cases and concludes that EDP continues 'strongly and comprehensively' in only a little over 20 per cent of the cases. Even though regional stakeholders participate in the EDP and ignite the process aimed at leading to novel thinking, 'the exploration is often based on analysis of the existing capabilities and previous knowledge' (Mäenpää, 2020, p.74) but the process should continue and not stop there. This underlines the need for capability building.

Gianelle et al. (2016, p. 15) argue that EDP is about prioritizing regional investment based on an 'inclusive and evidence-based process driven by stakeholders 'engagement and attention to market dynamics'. This makes handling EDP a key strategic

Figure 3 Organisational Innovation Competency

action. Therefore, for an impactful implementation of regional strategies and capabilities enhancing instruments become crucial.

Instruments directed at maintaining cooperation and activating the core concept of EDP and evidence-based policy making also enable implementation designs that address a) the challenges of collaboration between actors, b) support ways of exploring options within a complex combination of multiple influences, and c) balance tensions between diverting objectives, or ongoing long-term processes.

In terms of economic growth, innovation and entrepreneurial potential – SMEs have been established as the key actors in regional development. Governments are usually expected to facilitate SME participation, which is increasingly enabled by ICT and new ways of interaction for stakeholders.

One of the major obstacles in stakeholder interaction is overcoming the "cultural" gap, e.g. between academic institutions and firms, understanding and establishing sufficient trust to each other for more straightforward collaboration. The Organisation Innovation Capabilities Set is an attempt to provide an instrument to serve as a collaboration framework that enables building up trust, identity, and readiness for experimentation and action. The needs competencies that ensure fruitful soil for with new ideas, knowledge and capabilities through systematic stakeholder interaction.

In what way can regional development actors take action to boost EDP in practice? Taking action through integrating capability tools can lead to improved innovation and entrepreneurship processes in regional development. Tested processes and outcomes will be more widely used through the BSR and other macro-regions. The entrepreneurial aspects of enhancing the ability of regions with the help of the Organisation Innovation Capabilities tools lead to interconnecting the people, visions, governance and implementation activities to act upon strategy process and selected priorities.

While a successful actionable implementation for strategic impact requires new skills and competences, efficient governance channels and instruments that would allow regions and their actors to adapt swiftly to changing situations may not easily be available. The ability of the regional authority and its actors to orchestrate activities in order to leverage the regional ecosystem. However, the way in which science and policy makers collaborate within the innovation ecosystem may have locally different formats and may rely on different trajectories of capacity building specific for the region.

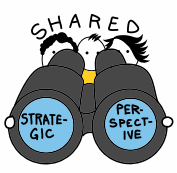
When regions' innovation actions need to involve relevant stakeholders in open and bottom-up processes they need competencies that allows them to manage the process of enrolling ideas, to manage the reflective process of balancing issues and stakeholder interests, and to lead to actions that can be measured in a way that results can be utilised by different stakeholders.

For innovative results, the management processes used in solving recurrent and resolvable problems, may not be enough, as these processes tend to be based on more unilinear management acts. The leadership vs. management dichotomy is a well-known (and paradoxical) conception in organization and management studies.

In general, in addition to strategy creation, organizations leading regional development include actions that we could categorize under broad conceptions such as governance, management, and implementation. It is however a balance of leadership, participation, and governance that is necessary to direct regional innovation systems towards results favourable for most actors in the region. One critical element from the aspect of strategy creation and implementation is asking the right critical questions from collaborating organisation and participating individuals. Another element that is needed is providing visionary guidance especially when trying to solve 'wicked' problems, i.e. those that are complex, novel and obstinate.

Therefore to reach the level competence which embraces the cross-competency and multi-disciplinary nature of successful regional and more importantly, cross-regional orchestration, new skills are needed that can handle and direct new types of interfaces: skills that allow stakeholders to act in new professional roles which may go beyond

Table 3 Organisational Innovation Competency Set

SHARED STRATEGIC PERSPECTIVE		The organisation/actors share/s commitment: to think of regional advantages long term and externally in order to positively shape the economic environment of the region; to develop and implement business strategies accordingly; to anticipate and perceive the impact and implications of future decisions and activities on other parts of the assets.
ATTENTION TO INTEGRITY AND INCLUSION		The organisation/actors is/are: an example in the region for treating all individuals with respect; for responding sensitively to differences and encouraging others to do the same; for upholding ethical norms; for maintaining high standards of trustworthiness; for acting as a role model for diversity and inclusion.
ENGAGING LEADER-SHIP		The organisation/actors act/s as a positive role model contributing to the collaborative entrepreneurial spirit in the region; collaborates towards and supports the development of other regional actors; participates with positive leadership in motivating, directing and inspiring others to succeed, utilizing appropriate evidence-based approaches.
BUILDING AND MAINTAINING PARTNER-SHIPS		The organisation/actors understand/s the potential impact of its own role on all actors and partners; contribute/s to an evidence-based evaluation of the advantages and opportunities for the regional end beneficiaries; build/s and maintain/s strong external relationships; is/are a competent partner for others in sharing own competence and in learning new competence (if relevant to its role and to the partnership).
RESULTS ORIENTATION		The organisation/actors efficiently establish/es an appropriate course of action for the regional/cross-regional partners to accomplish a goal; match/es strategic goals with actions that lead to total task accomplishment with concern for quality; is/are geared to see opportunities and takes the initiative to act on them; understand/s that responsible use of resources maximizes the impact on the region and collaborating regions.
SUSTAINING AGILITY		The organisation/actors is/are open to change and geared to be flexible in a fast-paced environment; effectively adapts own approaches to suit emerging circumstances or requirements; is committed to constantly reflect on experiences as a readiness to modify own behaviour to maintain strategic performance and competitiveness; pursues continuous improvements in strategy revision and implementation.
EMPHASISING SOLUTIONS		The organisation/actors base/s its decisions on data evaluation; pragmatically adjust/s courses of action; take/s an unbiased, rational approach guided by strategic priorities and purposefully calculated risks; constantly apply/ies innovation and creativity to problem-solving.
EFFECTIVE COMMUNI-CATION		The organisation/actors share/s and communicate/s ideas or facts behind actions in a concise and open manner; constantly indicates in its communication a consideration for the shared benefits through collaboration partners; actively listen/s to regional actors and proactively shares knowledge; handle/s conflict effectively by finding common ground in the attempt to reach goals and overcome differences of opinion.

their traditional professional expertise. Regional agencies and economic development authorities will need to function as ecosystem orchestrators, innovation architects, process mediator, roadmap curators, and activity initiators and conductors.

Based on the practical experience with regional Smart Specialisation implementation in the examined Baltic Sea regions, eight organisational dimensions can be outlined as an architecture of competencies. The basic challenge it to reach the quality of strategic readiness and leadership that any of the regional innovation actors need to be equipped with as drivers of change.

The eight dimensions we propose as elements of the Organisational Innovation Competency architecture are:

1. shared strategic perspective;
2. attention to integrity and inclusion;
3. engaged strategic leadership;
4. building and maintaining partnerships;
5. results orientation;
6. sustaining agility;
7. emphasizing solutions;
8. effective communication.

Organisations integrating a platform to embrace, monitor, and encourage these elements in their strategic actions can relevantly perform balance. The act and correct approach to balancing regional strategic action is considerably reinforced by applying this set of organisational competencies within organisations, or across regional stakeholders, as well as cross-regionally. The eight elements are described below.

The idea of committing to these shared organisational competences is to build both a balance and an innovation muscle. For this, regions must include innovation in their own competency models and in the competency models of their stakeholders. This in turn builds up a regional competency as a persistent pattern of behaviour resulting from a cluster of knowledge, skills, abilities, motivations and commitments. Therefore, the vision of a sustainable and entrepreneurial region will imply building a competency model that is persistent in the chosen direction and translatable into competences that drive regional and cross-regional action.

Regional organisational competencies will help in strengthening the ideal patterns needed for exceptional innovation performance. The organisational innovation competencies suggested here help regions embrace the elements that have been identified to sustain innovation: Creativity, Enterprising, Integrating Perspectives, Forecasting, Managing Change.[23]

Learning to directly involve stakeholders in open innovation processes requires powerful models, coached practices, good examples, and effective methodologies. To reach the level of competence needed for orchestration, the organisations as innovation drivers need new skills that allow them to act in new professional roles (for example: ecosystem orchestrators, innovation architects, process bridge-builders, roadmap curators, or activity conductors). These new professionals can facilitate activities and help regional actors to compose Smart Specialisation innovation hubs networking together in continuous activities “from bottom to top” and “from needs to action” processes.

Using the organisational competencies architecture as an instrument to tackle Smart Specialisation implementation is crucial to effectively alternate between the mode of open and entrepreneurial innovative leadership and managerial governance and reach a higher level of competency through use in action.

‘Critical’ organisational problems, such as a sudden crisis allows very little time for decision-making to guide action and can easily be associated with either a top-down ‘automatic’ mode of leading regional development, or with neglecting to act and take appropriate responsibility. In order to be prepared for such ‘critical’ events a habit/

23 https://www.innovationinpractice.com/innovation_in_practice/2011/04/innovation-competency-model.html#:~:text=Core%20Competencies%20of%20Innovation,weak%2C%20and%20analyzing%20these%20judgments.

competency in participatory and reflective action is important. This type of governance approach is the result of using instruments such as the architecture of organisational competencies suggested here, or, as another example, the capacity building instrument presented in the next section.

While the architecture of the organisational competencies is an instrument that organisations and individuals as regional actors can pursue to achieve in their specific roles constituting an evidence-base innovation system, the following third instrument, Innovation Camps, reflects a strategic collective competency for a collaborative transformational path.

Regional authorities, local agents, and multi-disciplinary organisations equipped with capacity building and competence renewal will be able to facilitate activities resulting in changes and improvements. Those organisations will function as leaders when orchestrating regional and cross-regional collaboration. They will not only define their specific strategic goals at regional and inter-regional level, they will also solve challenges in action and at a constant pace.

3.3 Innovation Camp as Strategic Action and Capacity Building Tool

How to learn from the past is well known: its sequence is action-observation-reflection-design-action. But how can we learn from the future?

(Otto Scharmer, 2007, p.56)

The Innovation Camps methodology has been the methodological motor of the Smart-up BSR project. While the methodology has been recently used for supporting territorial and societal innovation in Europe, in the Baltic Sea Region Innovation Camps have been used to increase capacity building for regional change. Therefore, there has been an emphasis on increasing innovativeness in the macro-region. Innovation Camps as a major learning instrument for cross-regional collaboration can enhance the innovation capacity of partner regions. Multi-national camp participants worked together for the benefit of the individual regions, but also to an elevated understanding of the macro-region as a whole.

Regional development activities are faced with constantly new urban challenges and this calls for many-faceted approaches and solutions. Therefore, the Innovation Camps methodology needs to be constantly linked with the fundamental reasons that drive the action locally.

The following illustration in Figure 4 summarises the elements of Innovation Camps from four different angles: the why, the what, the who, or the how. The action portrayed in the illustration represents vivid societal action towards innovation. In this way the Innovation Camps function in a similar way to an innovation ecosystem. Regional transformation, or the innovative and resilient community it results in, emerges from thriving activities in each of the four areas.

To function efficiently the instrument requires constant movement in each of the four sides which mutually mobilise each other. However, getting started and keeping the movement going needs that the four areas get into contact and interact. This becomes the main task of the Innovation Camps methodology. The 'what' domain feeds from the 'why' sphere. The 'what' can be represented by data in different formats, or as actions in different societal environments, or spatial demands. We can be guided by data that results from the 'why' questions, solutions become pertinent based on the questions which regions set themselves to ask. The 'why' sphere gives purpose to the other domains, and it also feeds from the 'who.'

Urban challenges have specific ownerships, and as it usually is in an ecosystem, action owners move in interdependence, they are both affected and have an impact. Each domain feeds from the others, but also needs to influence them. All four areas are necessary to produce solutions

Figure 4 Four Elements of Innovation Camps in Action[24]

that lead forward, the path towards a strategic transformation is a joint one.

Any of the sides in isolation would not be able to achieve the goal of transforming the whole. The entity, organisation, or the place addressed in Innovation Camps would not arrive at an innovation on their own. Although the work in Innovation Camps is multi-stakeholder and cross-sectoral it is local, aiming at a revived and resilient local economy. It is the interdependency with global perspectives and a cross-regional, national or global framework towards growth, that leads to an innovative transformation.

The illustration above visually exemplifies the complexity of the change context and the necessity of an instrument to bring the action forward is made apparent. Whether it is through Smart Specialisation or SDGs implementation as pointed out earlier as targets, Innovation Camps act as an instrument to gather different groups and layers of stakeholders to share, view, evaluate, propose, solve. The instrument of Innovation Camp brings the elements together which allow the regional or cross-regional partners to systematically work towards achieving results. Regional actors, through the Innovation Camp methodology, can test how

24 Why (why do stakeholders act and push actions forward?)
Who (who do the actions serve, who has the competence to act?)
How (how can instruments lead to results?)
What (what is required to enable local action?)

regional growth and competitiveness on the market as complex issues play out locally.

The strength of this instrument is its ability to build the innovative capacity of its participants. With the Innovation Camps methodology regions have an instrument that not only enables participants to be solution focused, but they also partake in a regional capacity building which will sustain individual, organisational, and regional competence for future change management and innovation eco-system orchestration.

As an instrument, Innovation Camps, allows a vivid hub of expertise and perspective sharing, it spurs continuous bottom-up and 'from needs to action' processes, and it operationalises cross-regional exchange. [25]

Consequently, regions using this tool to tackle the challenges they face, are able to implement their regional research and innovation policies and leverage their collective knowledge to achieve effective transnational collaboration. Whether it is about piloting and experimenting with new solutions in societally important areas – for example healthy ageing, climate change, circular economy, smart city and more – the instrument will foster regional innovation through peer-to-peer learning and initiating entrepreneurial discovery processes. In addition, the instrument advances professionally developed capabilities which are crucial for continuous action.

Based on information gathered from innovation camp organisers in the cross-regional Baltic Sea Region innovation camps which took place with the help of the Smart-Up BSR project, some insights from users were gathered. Included below are representative samples of the reflections by participants with reference to the four factors that need to be in place for successful results: what, why, who, how. Documentation of the innovation camp results is an essential part of the process. These results – in visual, textual and other relevant formats – are the basis for prototypes and experiments that can be implemented after the Innovation Camp. (for more details see Annex III).

Cross-regional Action

A wide orchestration of Innovation Camps can incorporate the mutual endorsement of strategic implementation between organisations, or regions. Consequently, Innovation Camps are a tool to both sustain the orchestration of placed-based innovation ecosystems as well as to validate effective implementation. The participatory methods of Innovation Camps can be used as instruments in recurring workshops and conferences throughout the implementation of regional strategies and Smart Specialisation strategic priorities.

Throughout cross-regional Innovation Camps process, partners, stakeholders, and facilitators can use examples from the various implementation approaches and in this way promote validation through new expertise. This builds the confidence to broaden macro-region-wide partnering with associated organisations.

A comment by a regional actor reflecting on the IC process reflects that "… it takes time to digest the learnings. We needed this journey to learn about the partner regions and the method and the local cases." In other words, it takes validation to reap trust, commitment and action. This regional organiser is positive towards the potential of the instrument for regional change and innovation. The willingness to build and leverage on the learnings also means that the reality of regional and municipal governance can be turned into action. Currently, Innovation Camps are often linked to 'projects' as frameworks to continue using the method. Validation in action is necessary to integrate the tool in regular strategic development activities.

Building capacity for running innovation camps allows regular use of the methodology. Reviewing

25 The methodology for organizing, running and documenting Innovation Camps is described in the JRC Innovation Camp Methodology Handbook (2017) as well as in the Quick Guide for Organising Innovation Camp (2020) which is an improved and updated guide based on the results of several innovation camps in the BSR region during the duration of the three-year Smart-Up BSR project. The initial guidelines were provided by a joint JRC-CoR (Joint Research Centre – Committee of Regions) collaboration for developing innovation camps. The quick guide uses these guidelines as a baseline and contains the practical experiences of cross-regional innovation camps in the BSR where it has been used to develop capabilities for the methodology, in regions where it had never been used before. Valuable advice and background knowledge on the Innovation Camp methodology can be found in http://www.idea-camp.eu/eu-camp-guide/.

Table 4 Innovation Camps Smart-Up Bsr Participants' Key Learnings

WHAT

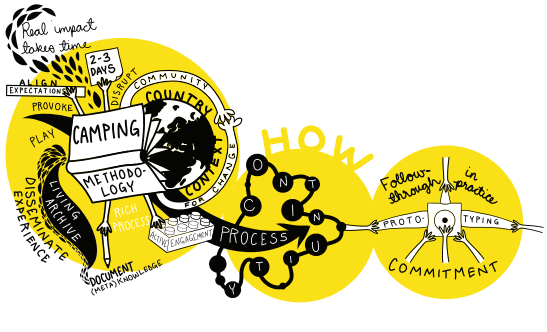
"The Innovation Camp is a great tool for exploring and finding new ways to solve challenges. The Innovation Camp brings together business, science and societal actors with different backgrounds, competences and experiences. Each representative has the opportunity to present their idea regarding the challenge to be solved. Innovation camps needs experts who can put together teams and who can evaluate the new ideas that are provided. The insights of the experts are important to reach an effective outcome of the innovation camp and channel the ideas into the right direction for the region".

WHY

"When having the innovation camp in your region what is valuable is the possibility for all participants and experts to experience the real environment and therefore become aware of different aspects relevant to the case and the challenge to be solved. To get the best out of this opportunity local challenge owners need to be present".

WHO

"… it is very important that the people gathered will not act as an audience, but they will actually participate in the innovation camp. The organizer of the Innovation Camp should understand that the aim is not the largest possible number of participants, but the participants should be representatives of different fields with different experience and competencies. Our experience showed that the innovation camp achieved the great success due to two factors: first, the specialists chosen according to the expertise in their fields and second, the moderator who was able to facilitate looking at the challenge from different angles, to mediate when finding the best solutions, and to guide the process of putting them together into an action plan".



HOW

"The most important aspects of the innovation camp are the participants, internationality, challenges, experts, the result achieved. To achieve this, it is necessary to combine all available human and financial resources, as well as to invite to join the partners and all our networks.

Our experience shows that intermediate presentations of team results to other teams and experts are significant and give a vital boost. During these interim presentations, the teams receive insights on other solutions by other participants that give a significant towards a feasible solution".

the differences between multiple scenarios provides a broader perspective and can lead to solving the regional challenge within the frame of participatory efforts. Once this capacity has been built, regions can go beyond simply building general scenarios and swots, these can then be incorporated as part of the challenges to be solved through orchestrated science-policy-citizen co-operation.

In practice it is valuable for validation to proceed with an accurate and accessible description of how innovation camps are prepared and facilitated and what principles are followed in the documentation of the actions. Steps taken, obstacles encountered, and appropriate solutions reached can be collectively reflected upon if Innovation Camps action are consistently documented. As a result, regional actors can extract valuable lessons and build up on the learnings.

Detailed outcomes of Innovation Camps conducted in all countries of the Baltic Sea Regions can be found in https://smartup-bsr.eu/engagement/

3.4 Summary

"Taking on board the diverse wishes of the outside world requires more than just a rebranding exercise. It needs deep introspection".

(Bomassi, L. & Vimont, P. 2019, p.3)

The key challenges for the place-based implementation of economic transformation through innovation can be addressed by applying specific strategic instruments securing a balanced evidence-based approach to policy making and safeguarding capacity building to taking regional action.

The basis for compiling the three strategic instruments in this chapter were the actions reflected upon by actors representing all levels of stakeholders within the Smart Specialisation strategy implementation and re-structuring processes in BSR regions. The analysis in chapter two considered the importance that the actors had assigned to their implementation pilots, the degree of participation, the scope of the activities, the United Nation SDGs integration, expected results and entrepreneurial mindset.

Experiences in building innovation hubs in these regions have indicated the advantages of working within the frame of specific strategic instruments for balancing regional change. This chapter related the experiences to capacity building via peer-learning, engagement and collaboration work, and presented the strategic capacity building instruments.

The instruments have the ability to enhance the discussions between the key local actors, drivers of regional development and innovation active from different levels. Strategic capacity building reaching from local entrepreneurial action to national coordination, or European level policy. More importantly, they are instruments to secure balance, in implementation, in tensions, and in breakthroughs.

Regional authorities, local agents, and multi-disciplinary organisations equipped with capacity building and competence renewal will be able to facilitate a continuous flow of revisions based on action results.

The following table summarises the key elements of the strategic instruments categorizing them into the four aspects of why, who, how, and what. The instruments which regions can use to initiate and maintain a sustainable and entrepreneurial economy. These four questions constitute the backdrop for the regional commitment to Smart Specialisation strategies and implementing actions serving their local development.

Regions can benefit by using these strategic instruments for collaboration between political, strategic and operational representatives from local

regions or from the macro-region. The playfield where strategic innovation capacity can be invested also include EU-level Smart Specialisation actors, the S3 Platform, JRC, Committee of Regions, Mirror Groups, Regio, DG Regional and Urban Planning, to mention a few key players in the regional and urban ecosystem.

Table 5 Overview of the Strategic Capability Instruments

INSTRUMENT	WHY	WHO	HOW	WHAT
Regional Strategy Diamond	- aiming at balance - catching actions that may be overlooked - avoiding issues to slip out of control	regional actors working together and interdependently	- repetitively innovating, testing, adjusting - monitoring strategic balance	strategic angles and their balance ensure regional sustainability and entrepreneurial mindset and economic growth
Organisational Innovation Competency	- better commitment - better policies - better implementation	multi-level governance and commitment	- shared expertise - consistent learning and competence renewal	emphasis on renewed commitment
Innovation Camps	- apply a system perspective to urban challenges	science, cities, business, citizens	- design thinking - challenge driven - solution focused multi-stakeholder dialogue	- participation in solving - orchestrated learning - shared action

4 RESULTS AND KEY LEARNINGS

4 RESULTS AND KEY LEARNINGS

Emphasising experimentation, and working across sectors and disciplines, the EU's research and innovation agenda will take the systemic approach needed to achieve the aims of the Green Deal.

(The European Green Deal, 2019, p. 18)

This study set out to tackle the overall challenge regions face of 'how to make regions more sustainable and entrepreneurial' with the intention to lead the way to the 'how' of making economic transformation happen.

Our study has also addressed another question that the challenge of sustainable and entrepreneurial economic transformation invites regions to pose themselves: What kind of strategic instruments and capacity building tools are needed?

Therefore, we have proposed strategic capacity building instruments for practices that are supportive of a triple/quadruple helix place-based approach able to sustain regions in answering the above-mentioned challenges.

This study was based on an analysis of several change management activities conducted through pilots in eight regions in BSR. The actions observed included orchestrating Innovation Camp activities and co-creating processes such as scenario analysis and regional forecasting through regional SWOT analysis for Smart Specialisation strategy, and multi-stakeholder participation.

Smart Specialisation revisions have allowed each region to revisit and update their implementation plans. Smart Specialisation has allowed a broad-based approach to innovation policy combining regional scientific knowledge production and entrepreneurial mindset with experience-based regional know-how.

4.1 Results

This is, above all, a continuous process that bolsters the region's economic foundation.[26]

By looking at the learnings from regions in the BSR macro-region we can conclude that it is not fruitful to search for a one-fit-all formula to answer the guiding questions. Therefore, a region that can be considered as having the competencies to successfully answer the guiding questions of this study is a region that is committed to assess and utilize its own and new resources in a way to create balance.

The combination of the various types of knowledge becomes evident through the entrepreneurial actions and vivid activities of learning by interaction. By analysing regional pilots for strategy implementation, we have an assessment of evidence-based strategy implementation. This exemplifies what Asheim, Isaksen and Trippl (2019) call DUI (doing – using – interacting). Therefore, we learned from analysing the pilot process is that transformation can only be reached by getting started: starting from sharing knowledge, continuing to learning from each other, exploring while doing, then reflecting together on the results of stepping forward, and through these interactions moving forward with revising action.

26 Helsinki-Uusimaa Regional Council (2020, Resource-wise Helsinki-Uusimaa Region.

Smart Specialisation, entrepreneurial mindset, and evidence-based policy making are key targets/policy/methods which regions need to combine with instruments for transformative policy making to be implemented efficiently. This study looks into eight regions in the BSR to gain a grasp of the methods of experimentation and engagement which were used through competence building processes to empower the actors for regional transformation. Smart Specialisation is instrumental to collect and create a specific thematic focus in a region towards a combined innovation capability for processes which drive sustainable and cross-regional economic transformation.

The instruments that this study has focused on are the Regional Strategy Diamond, the Organisational Innovation Competency Set, the Innovation Camps.

Regions using the Regional Strategy Diamond as a strategic instrument can point to the balance between all the aspects which each region benefits from. Each region can employ the tool to avoid imbalances and therefore secure positive results. If the strategy is looking inwards instead of working towards ways to compete and collaborate inter-regionally, the path towards regional transformation needs to be adjusted.

It is crucial to pay attention to the balance of the angles in the Regional Strategy Diamond to tackle competence isolation, brain drain, and/or attracting talents. However, all the three strategic capacity building instruments are useful to introduce a discussion around skills and capabilities when strategies do not safeguard competences.

When regions' innovation actions need to involve relevant stakeholders in open and bottom-up processes they need competencies that allows them to manage the process of enrolling ideas, to manage the reflective process of balancing issues and stakeholder interests, and to lead to actions that can be measured in a way that results can be utilised by different stakeholders. Eight organisational dimensions were outlined as an architecture of competencies.

Whether it is about piloting and experimenting with new solutions in societally important areas – for example healthy ageing, climate change, circular economy, smart city and more – the instrument will foster bottom-up regional innovation through peer-to-peer learning and initiating an entrepreneurial discovery process. In addition, the instrument advances professionally developed capabilities which are crucial for continuous action.

These approaches to regional development function as instruments individually or in combination. The lessons learned from the Baltic Sea regions lead us to understand that it is by utilising change management and capacity building instruments that actors can push the action forward.

The future reality of regions and the opportunities of public and private actors lies in preparing for change and movement. This is apparent looking at the transformations in the Baltic Sea region. In doing so, insights can be gained for European regions to master delivery mechanisms in their growth strategy. The aim is to share the experience of the Baltic Sea regions in their transition towards implementing their chosen Smart Specialisation priorities by multi-governance change mechanisms and by using supporting instruments to initiate and maintain innovation capacity for economic transformation.

4.2 Key Learnings on Mobilising Action in the Baltic Sea Region

"Each one of us is responsible for how well the strategy is implemented and how it is harnessed to attain growth in our municipalities and communities ".[27]

The study set its primary goal on examining how Baltic Sea regions can become sustainable and entrepreneurial. The results which lead to the set of strategic instruments presented in this study help to answer the guiding questions posed in the beginning of this study. Key learnings are perspectives of mobilising actions that lead to transforming BSR regions to a higher level of sustainability.

The advantage of the Smart Specialisation strategy lies in mobilising innovation hubs around selected priorities with regional relevance. However, cross-regional significance plays an additional role. When aiming at an inclusive future for the Baltic Sea Region we could say that envisioning a region's priorities and taking regional strategic actions is essentially a first step which needs to be followed by inter-regional cooperation. Consequently, looking for ways how regional priorities can be turned into cross-regional opportunities becomes itself a priority around sustainability and entrepreneurial evidence-based policy making. Let's first examine doing.

To include inter-regional and cross-regional actions, however, may need specific targeted efforts, which may not yet have been emphasised in the Smart Specialisation strategy creation, implementation, and revision work. We suggest that using the three instruments can assist in balancing the region's strategic action by including inter-regional objectives. With regard to maintaining balance among the angles of the regional strategy diamond, it can be said that a region achieving the aim of strategic balance is more likely to ensure that inter-regional collaboration will contribute to its success. It is worth noting that this applies to intra- and inter-regional engagement in several ways: strategic balance may include cross-border issues specifying inter-regional aspects such as cross-sector characteristics, or urban-rural perspectives, or any facets that can gain performance when handled collaboratively.

Stakeholders coming together around a common regional vision have enabled successful Baltic Sea regions to attract both international collaboration partners and funding from large EU funds for R&D purposes. While some BSR regions have a relatively clear and defined outline of regional strengths the majority of the BSR regions are still in the process of developing strategic focus in their own regional profiles. This implies further clarifying regional priorities, or alignments of regional and national spearheads. Based on place-based regional concentrations a macro-regional perspective could present a new step towards a sustainable economic transformation of the area.

The regions need to emphasise efforts that display action in sustainability. In addition, they need to give evidence not only of their willingness to enhance mechanisms supporting regional innovation, but of taking targeted action on their focused thematic outlooks. Regions like Kymenlaakso have shown that by stakeholders working together towards a common vision, opportunities for specialising can open up. The next stage can lead to finding areas with the greatest potential of collaboration between the local companies for new path creation inter-regionally and internationally. Actions executed in a manner of collaborative practices, where interests are shared and negotiated, can provide a calibrating opportunity to be scaled up at cross-regional level. In essence, rather than a 'me-too' approach, claiming a part of the action for each region individually, an 'us-too' approach could evolve into incorporating cross-regional development that can leverage more for each territory.

27 Helsinki-Uusimaa Regional Council (2020, Resource-wise Helsinki-Uusimaa Region.

To turn priorities reflective of the long-term strengths into consistent future opportunities a region's organisational structures need to be resolved to foster mobilisation. Through action pilots seem to be resolving differences in operationalisations and potentially conflicting multi-level governance patterns. The relation between regional and national policy in terms of Smart Specialisation strategy can complement results by building upon each other's action thus determining clear common priorities and bundling well-established domains into a common vision. This can facilitate the allocation of funds, support available resources and give determined actors the playroom for action.

In conclusion, we can say that Smart Specialisation processes in the Baltic Sea Region still need to evolve in a way that frees space for, and legitimates, shared action. Capabilities for inter-regional collaborative action as proposed in this study provide readiness for adjustments and new action.

In addition, when considering the role of Smart Specialisation as a means towards economic transformation in alignment with the Sustainable Development Goals the path towards sustainable regions is practically in its beginnings, though environmental technologies are prioritised in each region. Currently, only a few BSR regions consider Smart Specialisation as a prospective for the implementation of Sustainable Development Goals, which could include future opportunities for economic transformation.

Action orientation, we suggest, can be the result of the balancing efforts regions expose, when analysed through the Regional Strategy Diamond. On the one hand action orientation can function as the motor for adjusting the balance between all the angles of the regional strategy diamond. On the other hand, action orientation takes place most efficiently when all the angles are working together in a balanced way. Each of the dimensions in the regional strategy diamond affects the other dimensions in both positive and negative results. Action orientation pushes towards a regional strategy diamond analysis which allows the region to proceed by asking questions on how the positive and successful outcomes of one dimension can be utilized. While action orientation can be the initiating or triggering factors, it allows the region to get the domains moving forward, towards eliminating bottlenecks, and thus achieving balance which can sustain action.

Although some regions have a higher level of activity, no region or actor within a region, is exempt from having to continuously secure momentum. As envisioned through the study of Smart Specialisation strategy creation, revision, and implementation processes, future opportunities for the Baltic Sea Regions present themselves through:

To identify and support actors with cross-regional potentials cross-border synchronised actions need to back connections between research sectors and companies serving specific potential market segments. Linking potential innovation through science-based strengths can also create a recognisable regional brand (with focus and bonus) to attract science-based companies and increase critical mass.

Therefore, the power resulting from these intentional inter-regional evidence-based efforts should be recognized and actors will be able to channel their resource in constructive ways towards:

- Macro-regional collaboration,
- Active engaging of cross-border communities with entrepreneurs,
- Sharing Smart Specialisation priorities around sustainability, and
- Achieving leverage through Green Deal and SDG implementation.

Towards Cross-regional Capabilities and Actions

Regions need to set the course towards a transition to a more comprehensive and internationally applicable regional innovation system. They may attain economic transformation by building capabilities for cross-regional strengths based on balance for competitive assets.

The way regions compete includes a balance in the attitude towards their inwards and outwards

looking position. Ultimately international relevance is drawn from a strong local base and a willingness to participate in the global knowledge economy. This results in two paths: the path of utilising and contributing to globally available scientific and technological knowledge, and the path of relying on local, know-how-based, knowledge and competence. Smart Specialisation strategy and implementation indicate that there may be a tension between these two outlooks. However, when a balance of these two forces is obtained and most regions benefit from enhancing collaboration and a broader scope of cross-regional potential.

Each of the strategic instruments presented here directs the attention to cross-regional collaboration. This means upgrading the skills of regional actors in implementing economic transformation measures, such as Smart Specialisation strategy, from simply imitating traditional models of innovation ecosystems for job creation to increasing efforts in orchestration and regional balance. It is through strategic organisational competencies for innovation, such as orchestration, that regional actors build on and contribute to innovative solutions for the growth, sustainability, and entrepreneurial approach of their region, let alone the individual stakeholders.

Smart-up BSR also contributed to 'neighbouring' the innovation activities towards a non-EU country by directly working with research and academic partners in the St. Petersburg region. The example of the Smart City activities and the commitment of the St. Petersburg region to Smart City services and the well-being of its citizens showcases how aligned the visions are becoming in the BSR macro-region. Therefore, the message of this book underscores that strategic capacity instruments can benefit the balance in the Baltic Sea Region by creating closer cooperation of the BSR macro-region including its non-EU neighbouring region.

Joint activities to define regional innovation ecosystems is one of the outcomes of the Smart-up BSR collaboration to help the partner regions and thus the BSR in achieving the Europe 2020 Strategy. This includes utilising the proposed instruments for balancing connections to national and international networks, value chains and clusters, while still being able to maintain a way to steer improvements regionally. The full spectrum of stakeholders involved reaches from local actors in the public sector and SMEs to EU level institutions (CoR, JRC S3 platform, EIT Climate KIC). While no regionally orchestrated instruments can control an extended international collaboration, it is especially in capacity building that a wide exchange can be balanced and become fruitful. It may mean orchestrating involvement of funded BSR projects and emphasising a systematic focus on thematic pilots. This is in addition to other EU initiatives, such Open Agile Smart Cities networks, as examples.

Collaborative work on the regional balance among the five angles of the Regional Strategy Diamond is among the pre-requisites for purposeful and fruitful inter-regional collaboration. Emphasising balance in competitiveness can consequently lead to economic transformation in each region and in the macro-region as a whole.

With respect to collaboration, formal or informal, a cross-regional communication has proven to create transformative communities in the examined pilots. Smart Specialisation strategy underlines the need to communicate during the process of strategy creation and implementation. A collaborative approach includes communicating regional strengths in a clearer way which typically not only leads to stronger regional identity, but also to cluster building with the ability to co-operate cross-regionally.

Therefore, new industrial paths including new cluster building and cross-communication between clusters, themes, and priority areas is an important part of Smart Specialisation and place-based strategic and transformative communities.

EU-led and Baltic Sea Region projects guide towards cross-regional communication. Smart Specialisation processes as such can in fact be set up to form an overall cross-regional collaborative community which communicates through distinct Smart Specialisation strategic choices.

In addition, Smart Specialisation can be the trigger for cross-regional and cross-sector communication through formal piloting or informally emerging communities. Such a community has appeared among Finnish cities around Smart Specialisation strategy and as an evolution of informal gatherings based on the wish

to increase communication on Smart Specialisation related issues.

Communication between regional stakeholders as 'challenge owners' in the pilot activities is vital towards finding solutions. For example, discussions that took place between representatives from Klaipėda municipality and regional councils, regional municipalities, port authorities, businesses showed results in policy making (see Annex I). The capacity building instrument and detailed methods conducted between regional and national analysis of strengths, possibilities, weaknesses and threats lead not only to better understanding on how regions position themselves but function as a communicative tool to prepare for solving specific challenges.

Thus, the strategic instruments have the potential to induce progress and maintain clarity of communication around urban challenges including sustainable and entrepreneurial approaches, and consequently inter-regional collaboration can benefit the macro-regional perspective.

To achieve results through Smart Specialisation implementation leading to regional economic transformation the study recommends utilizing the collaborative activities for revalidation and refocus.

The Baltic Sea regions are examples that the approach of inter-regional collaboration and action taking based on cross-regional co-creation and co-investment along value chains are still being explored. This study proposes that balancing cross-regional collaboration has a major influence on the result of individual regions' actions and development towards a transformative community. This leads to collaborative working towards high level goals of sustainable and entrepreneurial economic transformation.

Towards Actions

Capacity building in Smart Specialisation process implementation therefore has potential to generate a tangible added value for industry, research, policy making, SMEs and citizens through inter-regional collaboration and joint piloting for innovation and competitiveness.

Through the mobilisation of the full spectrum of triple/quadruple helix partners, communities of businesses, knowledge institutions, regional governments can attract financial support for innovation when markets are not mature yet, or when crisis requires innovation.

Even when regions work in close synergy with national and EU public authorities, it is their capacity to link high-level goals to their place-based strategies and partnerships that contributes to tangibly pushing the development of new innovative business and public solutions forward.

The Smart Specialisation pilots observed in this study can generally be seen as a benchmark to leadership approaches and the application of monitoring systems. While data-based methodologies are applied in several regions, the competence distribution in leading the strategic process can be expanded. Strategic instruments can provide tools to fence off authority conflicts, fragmentation of impulses, and lack of coordination, and thus increase the efficiency of the strategy implementation.

To conclude we can summarize that Smart Specialisation has a role to play in mobilizing regions to address urban challenges with the capability to focus and reach sustainable and entrepreneurial outcomes. Every region can utilise the set of capability building instruments to put their variation of aspects in perspective when innovating. A formula that fits all is not the solution. However, a cross-regional dialogue may be advantageous in adjusting a regional balance and empowering an outward looking perspective, that may otherwise be missing.

Overall, the study finds that in BSR the Smart Specialisation concept is essential in bringing focus to the strategic intent and vision of the region, but it needs to be combined with the awareness of by mobilising actions a wider global impact can be reached. SDGs and Smart Specialisation strategy have a role for better use of regional potential and is able to yield a higher focus towards realising future opportunities as innovation is intertwined with the socio-economic fabric of the regions. Prioritisation as proposed by Smart Specialisation is not achieved without monitoring, reflection, evaluation and resetting strategic priority areas in an ongoing entrepreneurial process.

Most regions show that they have internalized the limitations of mainly relying on local knowledge and industry and have embraced the Smart Specialisation approach of linking triple and quadruple helix with strong ambitions in global knowledge, science, and technology. However, while having acknowledged that global knowledge is a necessity, the next step is to tie priorities with cross-regional actions.

The strategic tools equip regional performers by supporting the competences to execute a priority – diversification evidence-based validation. Capacity building instruments enable actors to constantly explore new avenues and innovation approaches and, even though disruptive entrepreneurial imbalance, be able to direct their efforts towards integrated sustainable solutions.

5 CONCLUSION

"In our current post-modern societies, people who are self-consolidating or self-governing are offered no solid norms they can use for guidance. … Ideally, it is a culture where we are self-aware and conscious of these processes and see a purpose in our own development towards feeling at home and belonging in still larger parts of the world".

(Andersen and Björkman, 2017, p. 405-406)

Regions often find it hard to involve relevant stakeholders in open and bottom-up processes and this is also reflected in the way how results can be utilised and built upon. Ideally, new forms of regional innovation should make a move beyond the predominant focus on business, research and policy, to include users and civil society. Learning to directly involve stakeholders in open innovation processes requires effective methodologies with efficient instruments that are easily applicable. Regional stakeholders need to reach a certain level of competence in collaborating around evidence-based approaches.

Using the different instruments presented in this study consistently and systematically turns Smart Specialisation into a powerful approach for a result-oriented thinking towards innovation ecosystems and for effectively orchestrated implementation of regional and cross-regional strategic processes.

5.1 Recommendations

"The Sustainable Development Goals (SDGs) can help us break up silos and prevent trade-offs and provide an occasion to strengthen our joint work on common challenges".

(Maira Mora, 2019, Director General, Council of the Baltic Sea Secretariat)[28]

By pooling together organisations in BSR countries which are responsible for Smart Specialisation the implementation experiences of the participating institutions contribute to increasing target-oriented commitment and motivation for experimenting, learning, piloting and rapid prototyping.

The observed results show that by means of strategic capabilities BSR regional partners are closer to becoming fluent in using placed-based innovation ecosystems through evidence-based policies and research collaboration. This necessitates a shift towards urban challenges solutions through change management tools and through building multi-governance competency through hands-on collaborative experience.

Strategic capabilities are essential for achieving an ingrained regional capacity to deal efficiently with predictable problems and to adjust to new challenges in an innovative and effective way. This also includes successfully practicing action driven placed-based experimentation and innovation as an integral part of the regional transformation process.

We propose that the instruments presented here can contribute to a systemic transnational partnering to pioneer place-based innovation eco-

28 Ahlgren, J. (2019), Circular Baltic 2020, p.6.

system development and thus to achieve macro-regional excellence.

The activities of the Smart-Up BSR flagship project have practiced shared collaborative actions and thus have encouraged strategic partnerships in implementation in the BSR. Actively assisting in such shared implementation contributes to making this a regular practice which is increasingly enhance by digital tools and platforms.

When a region has a central role in a specific industry it can be counted as one of the country's spearheads in economic growth. While some regions host a country's spearhead activities, other regions have the challenge of identifying their defining factors in the market to leverage on their territorial givens, whether central or marginal in a country's economy and geography. However, cross-regional collaboration can provide a fruitful context in case of a marginal position.

Climate change, demographic change, urbanisation, digitalisation and global economic phenomena affect every region at different levels of concentration. Likewise, the solutions to these challenges are best created where they appear. A region's sectoral profile may include elements that help solving the challenges these trends entail. As the solutions a region can contribute to locally will be crucial for the local economy, the strategic instruments proposed in this book are an opportunity for regions to respond, prepare, and build upon their local assets.

While some regions may possess a significantly larger portion of competence-intensive services than other regions, technological competence alone will not be enough in the future. A region's understanding of ecosystems, value creation processes and changes related to the ability to sustain regional balance is the best preparation for the future realities.


CAPACITY BUILDING
BALANCE
SDGs
INCREASED EMPHASIS ON
SMART SPECIALISATION
CAPABILI-TIES FOR EXPERIMENT-ING
BSR MACRO-REGIONAL ENGAGE-MENT
COMPETITIVENESS
STRATEGY
CULTURE & LEADERSHIP
ACTIONS
COMPETENCES
PILOT ANALYSIS
INSTRUMENTS
STAKEHOLDERS
1
2
3
4
5
6
7
8
ORGANISA-TIONAL
INNOVA-TION
COMPET ENCY
OPEN & BOTTOM UP
BALTIC SEA REGION
INNOVATION CAMP
INNOVATION ECO-SYSTEM

5.2 Concluding Remarks

"Meta-modern society is nowhere yet; we still have to develop it".

(Andersen and Bjorkman, 2017, p.406)

The strategic instruments Regional Strategy Diamond, Organisational Innovation Competency Set, and Innovation Camps serve two facets of implementation: balance and capacity building. The last strategic instrument, the Innovation Camp, serves both facets and induces action. Capacity building is relevant in providing readiness for action.

Readiness for action, which these instruments support, can lead regions and the actors in development of innovation ecosystems to a rethinking of the goals and how to attain them. Cross-regional collaboration becomes more manageable even if it incorporates processes between science and policy, as well as between policy makers and citizens. Strategic instruments also redirect action to benefit society as a whole. Capacity building takes balance from a business and competitiveness perspective seriously, but most of all it does not leave out the community perspective.

The analysis of the regional pilots as outcome of the interactive and dynamic capacity building processes pointed out that several solutions have taken place in the Baltic Sea Region. Thematic pilots, and revisions and implementation processes of Smart Specialisation have provided an opportunity in the Smart-Up BSR project to test and achieve a shared sense of progress and belonging. The study suggests that putting the capability forming instruments into practice allows strong engagement which leads to continuously negotiated improvements, both internally and cross-regionally.

Such instruments are valuable for strategies can be implemented, refocused and aligned with local/national visions. They are helpful in giving a stronger indication on whether regional priorities can generate incentives for new industry creation and lead to inter-regional opportunities.

An additional aspect is that the Baltic Sea region shares the EU's longest border with an external country – Russia and sharing development activities with the St. Petersburg region leads to benefits for the BSR as a whole. If all regions belonging to the EU and also Russia work closely together to share the experience in Smart Specialisation implementation and utilize digitalization in solving social and environment challenges the macro-region will be successful in protecting and preserving the Baltic Sea ecosystem whenever possible and practicable. The neighbouring Baltic Sea regions sharing RDI activities can co-create a systematic strategic transnational partnership in the Baltic Sea Region that can implement several of the Nordic objectives for an inclusive area that fosters wellness, strong identity, and entrepreneurial practices towards a sustainable regional economic development.

The role of Smart Specialisation strategy and implementation at regional level effectively includes the promotion of capacity building instruments as a way to endorse and to put into action the chosen spearheads, but also the wellness and quality of life that are fundamentally the goal of economic transformation. The realities of implementing the capacity building instruments proposed in this book for the creation of place-based innovation ecosystems with relation to the Smart Specialisation strategy process encourages incorporating the Sustainable Development Goals Agenda 2030 into the development initiatives of the regions.

This fulfils the aim to create a vibrant innovation ecosystem which engages different stakeholder groups to cooperate, boosts start-up culture and creates competitive edge based on region´s strengths and opportunities that are available regionally and inter-regionally.

We hope to inspire structural change, but also human progress. We hope that the Nordic secret

can enable people to keep and develop their local cultural heritage and help them find purpose and meaning in a rapidly changing world.[29]

This study has analysed actions taken by the BSR regions participating in the Smart-Up BSR project and has concluded that the path to sustainable and entrepreneurial economic transformation of regions goes through experimentation, prototyping and implementation. It also points to the need for instruments fostering capacity building.

Though innovation performance and innovation strategy approaches differ by regions, the pilot action in the represented BSR regions show attempts to integrate the implementation of Sustainable Development Goals Agenda 2030 in their Smart Specialization strategy creation and implementation. Regions will benefit from the capacity building tools to achieve their goals. While it can be assumed that these economic transformation goals are best achieved through cooperation within the surrounding sub-regions and countries, and while tools to support these improvements have been found to be still lacking, this study underscores the importance of capacity building tools specifically.

In this process the major insight for all of the participating actors, organisations, regions and individuals is that capacity building both helps solving new challenges and helps enhancing new approaches.

29 See the relevance to capacity building in Lene Andersen and Tomas Björkman (2017).

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ABBREVIATIONS

AHA – Active and Healthy Aging
AI – Artificial Intelligence
BSR – Baltic Sea Region
CAP – European Common Agricultural Policy
EIP – European Innovation Partnership
EIS – European Innovation Scoreboard
ERDF – European Regional Development Fund
ESIF – European
ESF – European Structural Fund
EUSBSR – EU Strategy for the Baltic Sea Region
IoT – Internet of Things
JRC – EU Joint Research Centre
LIFE – European funding instrument for the environment and climate action
LNG – Liquified Natural Gas
RDI – Research, Development, and Innovation
R&D – Research and Development
RII – Regional innovation Index
RIS – Regional Innovation Scoreboard
RIS3 – Research and Innovation Strategy for Smart Specialisation
RFCS – European Research Fund for Coal and Steel
S3 – Smart Specialisation strategy
STI – Science, Technology and Innovation
SDGs – United Nations Sustainable Development Goals

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ANNEX I – REGIONAL PILOTS

Denmark – Aarhus Smart City and GovTech

Importance of the pilot for the region

The Danish Business Promotion Board has identified a number of driving forces to strengthen the region – entrepreneurship, green growth and circular economy, innovation, digitization and internationalization – along with a number of key specialization areas/industries that will play a key role in the Central Denmark Region going forward. These include areas such as foods, energy and environmental technologies, digital technologies, business tourism and innovation within health, IT and creative professions. Investing in and developing new smart solutions is crucial for the public sector to meet the citizens' expectation of ever smarter and better public services within the given economic framework

Aarhus is working towards a more nuanced view of smart cities by creating a new frame of understanding, which incorporates two complementary concepts of *Civic Tech* and *GovTech*. The City of Aarhus' pilot project *GovTech Central Denmark* provides a proposal for how the public authorities in the Central Jutland Region can work together to intensify efforts to solve inherent challenges and make best use of emerging technologies with the aim of making the most of public spending.

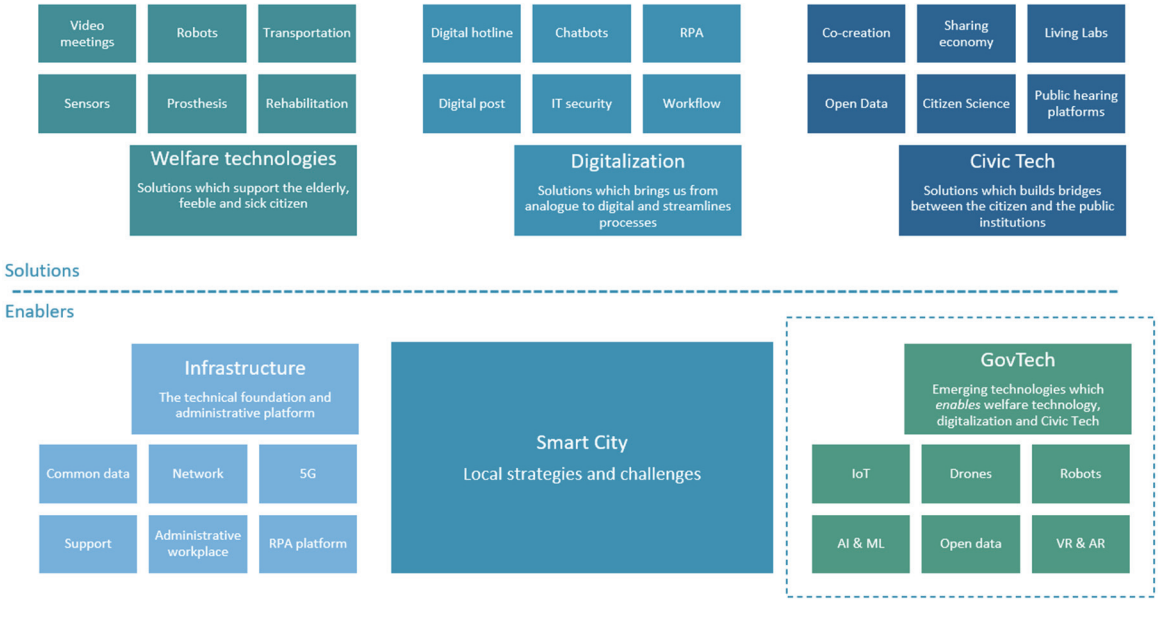

Figure 5 *GovTech* conceptual framework

Civic Tech enhances the relationships between the people and public authorities and in other words provides a tool to build bridges between the citizen and the municipalities. It is technology which enables us to include citizens to participate in the decision-making process and to make their voice heard. It also allows for the sharing of data about the city. Examples of *Civic Tech* include co-creation, public hearing platforms, open data, living labs and citizen science.

GovTech is the public institution's use of radically new technology to improve the delivery of public services through increased efficiency. *GovTech* complements the traditional technological infrastructure with emerging technologies, which allows the municipality to utilize other smart city solutions, i.e. digitalization, and welfare technology. Examples of *GovTech* include the Internet of Things, drones, virtual reality, artificial intelligence and machine learning. In a sense, *GovTech* can be thought of as the public institution's operating system, enabling them to deliver efficient services, while *Civic Tech* is the citizen's operating system, enabling citizens to connect with decision-makers.

GovTech through IoT, artificial intelligence, blockchain, drones, robots, etc. can improve the provision of public services through increased efficiency and lower costs. *GovTech* thus points to the inside of the public sector organizations and helps to optimize the way we do our work. *GovTech* is also about entering into new collaborations and new forms of collaboration with (typically) smaller suppliers (start-ups, SMEs) and with the educational sector than what has been the traditional practice, partly to stimulate the market and partly to gain access to the latest technology know-how. Here, the small start-up and SME "speedboats" are typically way ahead of the traditional "super tanker" organizations.

The purpose of *GovTech* Central Denmark will be to create a strong link between the public authorities in the region and the businesses by:

- Supporting the public authorities in the region to further push forward the area of public digitalization that is about understanding and leveraging radically new technology
- Serving as a working community and platform for upskilling employees in understanding and working with development, procurement, implementation and use of e.g. IoT technology, drones, robots, artificial intelligence and similar technologies through on-site and virtual project participation
- Stimulating the local business community and seize the opportunity for growth in the area
- Creating a position of strength in the Central Denmark region in the Smart City and *GovTech* areas, based on both the municipalities' and the Region's needs
- Developing concrete solutions for use in the municipalities and in Central Denmark Region
- Establishing and coordinate the collection and sharing of knowledge, know-how and best practices in the field across actors in the region
- Establish new forms of collaboration with the education sector and in this way support as well as utilize the innovation capacity of the educational institutions in the region, e.g. by having ongoing collaborations with various fields of study, where the municipal challenges and the Central Denmark Region's challenges are brought to the attention of students who through projects create innovative concepts or solutions based on the latest research and knowledge of technology etc.
- Creating a joint organization that can both absorb and influence the national and European agendas in the field, including forming a strong and competent interface against Danish government agencies such as KL, DIGST, ERST, EU, OASC and others. on e.g. data standardization and fair AI
- Developing and driving a shared strategy in this area.

Involvement and participation

Projects do not exist in a vacuum, but rather build on other complementary projects in a larger context. The main stakeholders in our pilot are municipalities. *GovTech* Central Denmark will provide a platform and organisation where public institutions can pool resources, knowledge and experience to explore technologies that would be unattainable for the individual municipalities. It also allows us to test scalable solutions, which can more easily be implemented across municipalities and across borders. Furthermore, *GovTech* Central Denmark will give the municipalities a more cohesive and much stronger purchasing power, which allows the municipalities to make more specific demands to suppliers instead of solely relying on "stock solutions". Finally, *GovTech* Central Denmark will position the Region of Central Denmark nationally as well as internationally as a Smart City powerhouse and frontrunner.

The *GovTech* Central Denmark consortium currently consist of 19 municipalities, the Central Denmark Region and the two business organizations Business Region Aarhus and Business Region MidtVest. As we get further in the development of the *GovTech* centre, we will increasingly include a wider range of stakeholders, i.e. SMEs, suppliers, larger tech companies, business organizations, universities and knowledge institutions, etc.

There are overlaps between the pilot projects, especially with Aarhus City Lab being a test facility for innovative smart city solutions. Some of the solutions developed in *GovTech* Central Denmark could easily be tested on a small scale in Aarhus City Lab before scaling the solutions and implementing them at a much larger scale across the region. Aarhus City Lab also has the potential to be scaled further and developed as a regional living lab to complement *GovTech* Central Denmark. Furthermore, and significantly, the pilot projects' innovation ecosystems are complementary meaning that *GovTech* Central Denmark draws on the partnerships that has already been established in Aarhus City Lab and vice versa.

The public authorities in the Central Jutland region have the opportunity to create a significant position of strength in this area and at the same time scale good and sustainable solutions to the benefit of the community, thereby helping to save resources and solve the challenges facing society today.

Some of these solutions will be municipality-specific and are based on the challenges of individual municipalities. Other challenges are transversal and are more pronounced in the regional work, still with a high degree of commonality. This requires more cross-sectoral cooperation, and it is especially on these challenges that the potential of collaborating more formally on the development of common, sustainable and scalable solutions can benefit the entire region and position the region as a European front runner.

The process of establishing *GovTech* Central Denmark began with forming a strong project group, which would spearhead development of the concept, formulate the vision and intended activities and suggest a governance model and budget. The project group consisted of chief digital officers from three municipalities (Aarhus, Favrskov and Horsens), directors from the two Business Regions and Heads of Offices from the Region of Central Denmark. This project description was then presented to the remaining municipalities at the kick-off meeting. Members of the initial project group included:

- Aarhus Municipality
- Horsens Municipality
- Favrskov Municipality
- The Region of Central Denmark
- Business Region Aarhus
- Business Region MidtVest

Given the shift in responsibility regarding stimulating business and growth away from the regional level to the municipality level, it is imperative that City of Aarhus will embrace this responsibility and opportunity to establish the city as a large-scale testbed for innovative urban solutions that can stimulate growth in the area. Central municipal strategies such as the Climate Plan and the Smart Aarhus strategy will play a key

role in forming this. It is only a natural next step to establish a strong, cross-cutting collaboration on emerging technologies and the *GovTech* area in the Central Denmark Region.

Ecosystem orchestration

Denmark has a strong tradition of cross-municipal knowledge sharing and collaboration on, amongst other things national IT infrastructure, digitization strategies, common municipal platforms, Open Source, Open Data and different digital and Smart City clusters. Here work is done to ensure common progress, standards, catalogues of inspiration and low-practical templates for the benefit of the community.

The City of Aarhus plays a significant role in several of these existing initiatives and because of the potential rewards of further collaborating on the uptake of emerging technologies, the City of Aarhus has chosen to also spearhead the *GovTech* Central Denmark initiative by framing the potentials, scoping the collaboration and ensuring buy-in from the 19 municipalities in the region as well as the Region itself.

GovTech Central Denmark is a trans-regional initiative with the purpose of enabling municipalities to explore, test and implement emerging technologies. The centre is an initiative by the 19 municipalities in Central Denmark, the Region of Central Denmark and Business Region Aarhus and Business Region MidtVest. In total, the public authorities represent more than 1.3 million citizens and includes some of the most vibrant innovation hubs, exiting tech clusters and forward-thinking public authorities.

GovTech Central Denmark is the product of the realisation that we are facing the same challenges and that we can get further for the same resources by working together. *GovTech* Central Denmark is a platform and an organization where public authorities can come together and form more structured partnerships than what has traditionally been done. The centre will have a permanent staff of 6 employees who will manage the day-to-day operation, examine funding opportunities and consult municipalities in the projects. The individual projects, which are developed in *GovTech* Central Denmark can either be managed in a decentralized manner by the one of the municipalities or directly by one of the permanent staff in the centre. Furthermore, the municipalities have the option to have one of their employees stationed in the *GovTech* centre for an extended period (a minimum of 6 months). This will allow municipalities to improve the qualifications and experience level of their employees and will allow *GovTech* Central Denmark to draw on the competencies and expertise of all municipalities in the region. *GovTech* Central Denmark unites the local projects, resources and competencies on a regional level and builds a “proxy” to regional and national agendas on behalf of local government.

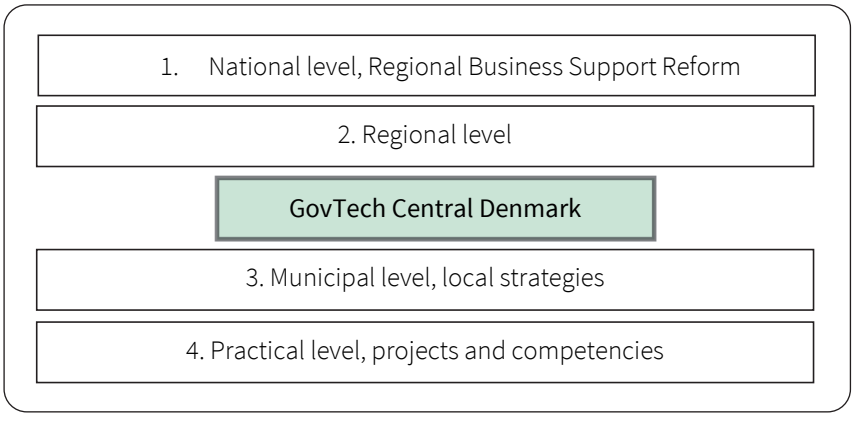

Figure 6 Role of GovTech Central Denmark regionally and nationally

Pilot activities

GovTech Central Denmark is an attempt to get more done with the same resources, but it is also about establishing a much more vibrant innovation ecosystem. For the public authorities, *GovTech* Central Denmark will be a platform for cooperation, competence development and knowledge sharing. It will allow municipalities to develop and implement solutions, which would be unattainable on their own. For companies and suppliers, it creates a much larger and more cohesive market where suppliers have a single-entry point to contact and sell products to all the public authorities. For the region, *GovTech* Central Denmark is a way of positioning and strengthening the Region of Central Denmark as an innovation cluster nationally and internationally.

Alongside the establishment of *GovTech* Central Denmark, Aarhus is developing several complementary projects, which have significant overlaps. One of these projects is Aarhus City Lab, which is Aarhus Municipality's digital playground for innovative smart city solutions and a platform for having dialogues with citizens about the role of technology in our society. Aarhus City Lab is a place where the municipality can cooperate with local actors who are interested in developing and testing new technologies, i.e. Aarhus University, SMEs, tech companies and suppliers, entrepreneurs, students and citizens. Aarhus City Lab is a living lab, which means that it provides a venue where experiments can be setup in a realistic use-context and that the end-user is an active participant throughout the process.

Aarhus City Lab acts as a single point of entry into the municipality for external partners: facilitation and coordination are key aspects of Aarhus City Lab to ensure that the right people are matched. Furthermore, Aarhus City Lab acts as a forum for dialogue between citizens and the municipality. Aarhus City Lab is placed pier at the very heart of the city and is a very well-visited area during the summer months. Therefore, it offers great opportunities for the municipality to meet and engage with citizens. Aarhus City Lab will regularly host presentations, prototyping, host Open Lab every Friday and have a mobile office during the summer months.

GovTech Central Denmark will be a network and an organization, which has the expertise and resources to - on behalf of the network - explore, develop and test technologies in concrete projects and solutions, which the municipalities easily can implement afterwards. *GovTech* Central Denmark will have four focus areas:

1. **Project development:** maintain a common technology radar; benchmark the market and suppliers; testing technologies and getting hands-on experiences; advice municipalities in choosing and setting up equipment; identify concrete needs, use-cases and business-cases¨
2. **Establish and manage projects***:* establish best-practices for public-private partnerships; establish development partnerships in areas where the market is not yet established
3. **Purchase and implementation:** establish best-practices for purchasing and calls for tenders; formulate standards for purchasing IoT-solutions, drones, AI-services, etc.; ensure data ownership and open data; assist in organizational implementation
4. **Dissemination of knowledge and competence development** be a centre for competence development; develop and distribute IoT- "starter kits"; arrange inspirational workshops and presentations; maintain a catalogue of use-cases and best-practices

GovTech Central Denmark is an attempt to get more done with the same resources, but it is also about establishing a much more vibrant innovation ecosystem. For the public authorities, *GovTech* Central Denmark will be a platform for cooperation, competence development and knowledge sharing. It will allow municipalities to develop and implement solutions, which would

Figure 7 IoT suitcase

be unattainable on their own. For companies and suppliers, it creates a much larger and more cohesive market where suppliers have a single-entry point to contact and sell products to all the public authorities. For the region, *GovTech* Central Denmark is a way of positioning and strengthening the Region of Central Denmark as an innovation cluster nationally and internationally.

As a much more concrete part of the pilot the Innovation, Technology and Creativity Department of the Municipality of Aarhus (Aarhus ITK) is also developing an IoT-suitcase, which contains a wide variety of sensors that can be utilized in a range of different Smart City applications. The IoT suitcase is a starter kit, which municipal departments could purchase to start experimenting with IoT solutions or to suit specific needs. A solution like the IoT suitcase will also be made available in *GovTech* Central Denmark where municipalities can get guidance in getting started using IoT sensors and get consultation on purchasing an IoT-starter kit.

The IoT suitcase contains a basic set of IoT sensors for learning and easy deployment:

Results

Aarhus is the second largest city in Denmark and is one of the most advanced cities in innovation, technology and smart city solutions. As the largest city and municipality in the Region of Central Denmark, Aarhus spearheads the development of smart cities in the Region. However, the many of the remaining municipalities in Central Denmark are not as advanced in terms of innovation and technology and the smart city-agenda is difficult for many of the smaller municipalities and cities. It requires resources, knowledge and expertise, which many of the smaller municipalities simply do not have. Even for a large city like Aarhus, it can be difficult to work with new technologies on a scale that really matter. Therefore, the municipalities have decided to band together and find common solutions to common problems.

Aarhus Municipality has taken the lead in the initiative and *GovTech* Central Denmark will physically be placed in Aarhus, more specifically, in Aarhus ITK – a division in Aarhus Municipality working with innovation and technology. Aarhus ITK has extensive experience in developing and managing innovation projects and spearheads Aarhus Municipality's exploration of emerging technologies. Examples of this include using virtual reality to counter social anxiety when taking the bus or going to the dentist; using crowd sensing and citizen science to map and combat air quality issues; utilizing drones to detect oil spills and robots to clean up the oil; setting up thermal cameras to quickly and accurately detect if someone falls into the river in the city centre; and much more. Aarhus ITK participates in several European projects and already leads several cross-municipal initiatives and networks, such as Open Data Denmark, which coordinates public institution's promotion of open data, and OS2, an open source and digitalization network consisting of 69 Danish municipalities.

Evidently, cross-border cooperation is integral to Aarhus ITK and is an important priority. It is based on the idea that we are stronger together; that progress should be shared, and smart and innovative solutions should be made available to all. That is why open source and open data is such an important part of Aarhus ITK's work. This is also the main idea that the pilot is meant to promote further. *GovTech* Central Denmark is an attempt to do more together and find common solutions to common problems.

In March 2018, Aarhus hosted an innovation camp as part of the Smart-Up BSR activities. More than 70 participants from Denmark, Finland, Estonia, Latvia, Lithuania, Russia, Poland, Germany and Norway participated in the innovation camp, which was the first large-scale project activity. Over the course of four days, the innovation camp focused on how to cooperate and find common solutions to the contemporary Smart City challenges and allowed the participants to share ideas, experiences and knowledge. The workshops were facilitated by Aarhus ITK and Centre for Innovation Aarhus (CFIA) and introduced the participants to the methods, approaches and initiatives, which makes Aarhus a European leader in the area.

Meanwhile, the Danish government passed a reform that affected the regional business development system. This means that the Regions can no longer engage in activities which promotes business. It also means that the Smart Specialization Strategies, which had previously been formulated by the regions, will now be formulated at the national level by the Danish Business Authority. Up to this point, the Region of Central Denmark had been the responsible actor, the pilot therefore had to be rethought.

Alongside these changes, a project group headed by Aarhus Municipality began to develop an idea to create a transregional unit to cooperate on IoT and smart cities strategically and at a larger scale than what is possible in the individual municipalities. This process has been ongoing for a while but began in earnest in the fall of 2019. During the process, the project group developed a more nuanced concept of smart cities with the introduction of *GovTech* and it was agreed that the transregional unit should focus on enabling the public authorities to explore, test and implement emerging technologies. As part of this process the stakeholder ecosystem around the *GovTech* Center was orchestrated.

The kick-off meeting in March 2020 and was attended by chief digital officers and consultants from 15 municipalities, directors from Business Region Aarhus and Business Region MidtVest and Heads of Offices from the Region of Central Denmark. A total of around 30 professionals attended the kick-off meeting. The workshops were designed and facilitated by Centre for Innovation Aarhus (CFIA) and intended to clarify the aims and activities of the *GovTech* centre and to determine a governance model, including the organization and budget.

During numerous innovation camps deep insights were gained into the local challenges and opportunities of the hosting cities and regions as well as those of the other participants. This has forced Aarhus to view own challenges and opportunities in a new light.

Future Steps

As of May 2020, Aarhus is in the process of seeking formal commitment from the stakeholders and are elevating the strategic level by involving the Municipal Chief Executives.

The ***GovTech*** centre will complement the individual municipalities' strategic work with Smart Cities and the national and regional priorities in the new Business Development Strategy, which is considered to correspond to a Smart Specialisation strategy.

The network established through our participation in innovation camps and pilots, have proven of high value by allowing to extract learnings from other regions strong on cross sector, cross function collaborations. Visits and opportunities to discuss different approaches to collaboration, innovation and organization with them were enabled through Innovation Camps. Furthermore, research networks and other successful partnerships in the Baltic sea region will continue going forward as will interpersonal relationships that shape actions of high value for the future.

Estonia – Tallinn Smart City

Importance of the pilot for the region

Tallinn City has chosen smart city as the spearhead topic for its pilot to build on top of already existing competencies in ICT. Also, Tallinn City is interested to be a smart city hub in terms of RDI, practical use of new solutions and attracting companies in this field.

Tallinn City is currently involved in a large number of different projects either as a regular project partner or less so as the lead partner. The system is based on bottom-up logic. Usually it is the individual departments or other city-affiliated organisations that start or get involved in different projects by getting an invitation from a lead partner. After that the department has to show to the city's strategy unit that the project helps to fulfil the city's development plan. If strategy unit gives it accept, the department has to defend the project before the City Council. Usually most of the project ideas get the accept from both the strategy unit and the City Council.

There are several reasons why Tallinn Enterprise Department wanted to change project development processes in the city. The awareness about new project initiatives has been low in different departments of the city government. Although all projects are in a project database, this does not ensure that different departments and decisionmakers know what is happening. This led to a situation with two problems. First, different departments were sometimes involved in similar but separate projects. Second, when entering and developing new projects, the departments did not analyse how the project could impact the activities of another department.

In addition, as most of the project ideas manage to get through the strategy unit and get accepted in the City Council, there is a question of how thorough the strategy unit is as a filter. If projects are only loosely related to the actual goals of the city's development plan, then we can expect inefficient use of human and financial resources which would be needed for more important activities. Tallinn City Government envisions that by renewing its project development processes the city can:

- better evaluate each project's economic impact and link with the city's priorities;
- use financial and human resources more efficiently and effectively;
- establish a thorough overview of projects and resources in use;
- and make sure that projects are run on the same principles.

Involvement and participation

As the pilot's focus is on the city's internal processes, a wider circle of stakeholders was not involved. The implementation of Tallinn pilot is not so much dependent on the wider ecosystem as the focus is on changing the internal processes in the city. However, implementing the pilot helped to build stronger ties with actors in the local ecosystem and in the BSR region through more meaningful projects

This focus on smart city activities has helped the city to support and start several different initiatives. Some other initiatives have been more collaborative as the project has helped Tallinn City to establish contacts with different BSR partners. In addition, the cooperation between the city government and Tallinn University of Technology was also strengthened.

Pilot activities

Tallinn Enterprise Department organised the SWOT workshop in November 2018 based on scenarios developed by Helsinki-Uusimaa Regional Council. Strong ICT sector, lively start-up scene, competitive tradable services, and trustworthy internet and web environment were identified by the participants as the main strengths of Tallinn and the surrounding region.

In the context of climate change, it was found that the location of Tallinn can alleviate the negative effects of climate change and undesired migration problems. It was also noted that the region can be self-sufficient during the crisis.

Weaknesses related to the size, scale and structure (population, economy, resources), and limited attraction of talent were identified in the context of growth & globalisation. Protectionism and segregation/polarisation can harm Tallinn in two ways. First, the city functions as the country's international gateway. Second, Tallinn is smaller in comparison to other cities in the region.

The biggest threats to the region and Estonia as a whole were seen in the context of disintegration & fragmentation scenario (EU, NATO, eurozone) as the resulting risks of currency vulnerability or national security (Russia). Another aspect identified in the context of polarisation and segregation is the small size of the country and region together with two separated language groups in Tallinn City Region. Another threat identified was change in domestic policy as a response to the external developments if the new policy will focus on contraction and enclosure.

The SWOT analysis led to some of the topics and issues being included into the new Tallinn Development plan for 2021+ such as the issues with segregation in Tallinn City and attracting international talent.

Tallinn City Enterprise Department organized Tallinn Innovation Camp with ca 100 participants who were divided between seven teams to solve three challenges:

1. How to smarten up the region?
2. How to increase citizen participation and promote co-creation to improve living environment and quality of life?
3. How to make the city digital with the help of artificial intelligence and co-creation?

Amongst the participants were representatives and experts from other partner organisations of the project, city officials and master's students. The challenges were very strongly focussed on how to improve urban space and utilize digital solutions in the city. Several interesting solutions were pitched by the participants.

One of the ideas under Challenge 1 was an app which by using gamification features would provide users a possibility to map out areas that need improvements (e.g. large piles of trash, infrastructure that needs repairs etc). The second idea under Challenge 1 was a collaboration platform targeted towards apartment unions. Two ideas were pitched under Challenge 2 which focussed on revitalizing old ABC centres and closing the gap between the city government and local communities by hiring community managers in large apartment block areas. Challenge 3 focussed on AI and two ideas were pitched: an AI solution which would manage the traffic flow, and an AI-based reporting tool for citizens.

The Innovation Camp format has been adopted by the Tallinn Science Park Technopol. It has developed its own innovation programme called Momentum which is offered as a service for companies and public sector organisations to develop new products and services.

More information about Momentum can be found through the following link: https://www.tehnopol.ee/en/momentum/momentum-case/.

Several ideas developed during the camp have moved forward. For example, the use of AI in traffic management was an idea under discussion in Tallinn City already before the innovation camp, the event and the pitched idea gave an additional push to move forward with it.

The first pilot activity was the writing of the report by the Baltic Innovation Agency (BIA). The aim of the report was to compare Tallinn City to other important cities in the region from smart city perspective. This list included Helsinki, Riga, Vilnius and Copenhagen. The report looked at where these cities are located in different (smart) city rankings and what are the most notable smart city developments/initiatives in these cities. BIA also conducted a SWOT analysis by interviewing a number of experts from the local smart city ecosystem and using previous analyses, different strategies and the previous Smart-up BSR SWOT analysis. Based on this analysis, BIA provided a number of recommendations for Tallinn City such as supporting real-life piloting, organising

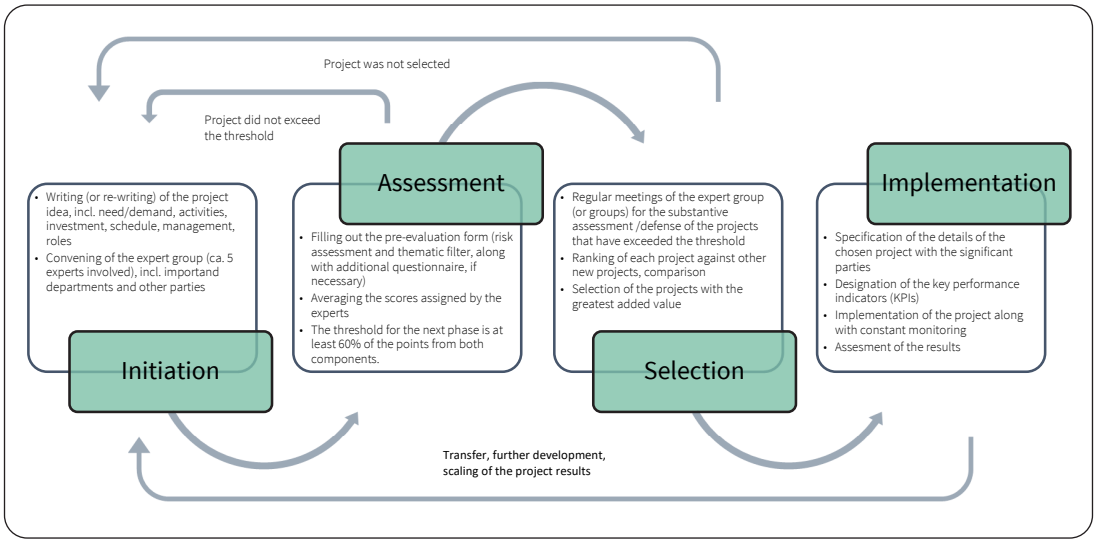

Figure 8 Tallinn City Smart Specialisation Project Assessment Tool

smart city hackathons, bigger use of innovation procurements.

In addition, BIA developed a smart city project assessment tool for Tallinn City which could be used to assess all new ICT and smart city project ideas. The assessment tool focuses on risk assessment and potential benefits that the project can bring in different areas (economy, governance, environment, people, living, energy efficiency, mobility, ICT). This new assessment tool will play an important role in renewing project development processes in the city. Figure 1 shows how the new process will roughly look like.

The role of the assessment tool is to provide an ex-ante evaluation for project proposals. Projects that get a score of at least 60% both through the assessment tool and from the experts will move to the selection round. The selection will be made by a committee which consists of experts from different city departments but also from outside

Results

As part of its pilot, Tallinn City together with the Baltic Innovation Agency has developed a smart city project assessment tool (described earlier) which the city plans to use starting from this summer.

In cooperation with Tallinn Science Park Tehnopol, Tallinn City has launched its own innovation fund called Tallinnovation to find and implement smart city solutions in Tallinn. The fund distributes funding on a competitive basis. The goals of Tallinnovation are:

- to support cooperation between the City of Tallinn and technology companies by enabling the use of innovative software or hardware products in the City of Tallinn;
- to support the City of Tallinn's ambition to make the city environment more modern, sustainable, citizen-friendly, and open;
- to introduce innovative smart city solutions, products, and services to the City of Tallinn;
- to raise the awareness of Tallinn City employees and officials about new possible innovative developments in the urban environment.

More information can be found through the following link: https://innovatsioonifond.tehnopol.ee/en/#goal

Tallinn City has financially supported the establishment of smart city professorship in the School of Engineering at Tallinn University of Technology. A number of other stakeholders have been involved with the establishment of smart city professorship such as Ericsson, AS Mainor and different private companies located in Ülemiste. Together with Technopolis, AS Mainor is the major developer of Ülemiste area. The company supported the establishment of the professorship with 500000€. In addition to research in smart city area which by nature is interdisciplinary, the aim of the professorship is to support the collaboration between Tallinn University of Technology, Tallinn City, private companies involved in the development of smart city solutions and real estate developers in Ülemiste.

Results can also have a wider impact at the BSR macro-region level. If this new approach helps the city to prioritise human and financial resources, Tallinn City could be involved into larger and more wide-ranging projects.

Further steps

The actual implementation planned for summer 2020 will experience a delay because of the Covid-19 pandemic as well as due to structural changes in the city government. The restructured city units will take the pilot results further as soon as they are operational.

At the moment, Tallinn City is one of the six partner cities (other cities include Amsterdam, Helsinki, Paris Region, Copenhagen and Stavanger) in the AI4Cities project where the idea is to use pre-commercial procurement process to procure AI solutions in the fields of energy and mobility to move towards carbon neutrality. The City of Tallinn has shown interest to use this project to procure an AI solution for traffic management based on the pilot ideas.

Tallinn City is also a partner in the project CENTRINNO. One of the initial reasons why Tallinn joined the project was the potential to test out the idea of having community managers.

For future implementation it was identified that alignment with Scandinavian countries is the biggest precondition for favourable business opportunities (Scandinavia as the home market, joint sales and promotion abroad). Pan-regional development can be facilitated through meso-level strategies, e.g. Baltic Sea Region Strategy. Trade barriers can create opportunities in the context of lesser competition from Asia. Liberal migration can provide access to talent beyond the EU, mainly Ukraine and Belarus.

Finland – Helsinki-Uusimaa Active and Healthy Aging on the Move

Importance of the pilot for the region

Helsinki-Uusimaa as smart region is specialising in technology, wellbeing, cleantech and digitalisation. In each of these areas different players from the whole region - business, cities, public sector, research, education centres, start-ups and the citizen - create smart innovations and tests together.

The Helsinki-Uusimaa region includes cities that takes sustainable development very seriously and concentrates efforts towards a safe, healthy and functional everyday life. Helsinki is for a good life.[30] Espoo is gearing to be a carbon neutral city by 2025 and is working to be a forerunner in the UN sustainable development goals.[31] This can be achieved through Espoo's values, attitudes, operating culture and common goals.

This Smart Specialisation strategy for Helsinki-Uusimaa promotes the economic development of the region with the help of the latest information and new innovative solutions.[32] Therefore the region chose to run a pilot to map the overall network action in the region in the sector of health and wellness. The pilot of Helsinki-Uusimaa aims for more effective coordination of local stakeholders' efforts hopefully leading to novel action, research, and innovation in the Active and Healthy Aging (AHA) sector. Here the target group are the public and private actors involved in developing AHA measures and bringing active and healthy ageing into practice. The pilot seeks to find common ground between AHA activities and the digital health care

The goal of mapping the regional network action in active and healthy aging is to find ways to enable different stakeholders to strengthen the networks, to learn from each other and to form combinations of skills. The mapping exercise will foster both local and cross border co-operation in the Baltic Sea Region. BSR regions will benefit of new visions and collaboration possibilities on the AHA theme.

For Helsinki-Uusimaa Regional Council the role is in catalysing and promoting active and healthy aging – related initiatives and to facilitate a more coordinated approach. In addition, the goal is to attract international funding and projects towards policy formation (especially related to RDI).

The exercise of mapping AHA-actors was considered important for Helsinki-Uusimaa as well as for a wider cross-regional collaboration. We decided that after mapping the AHA network for the region it would be fruitful to share both the learnings and information gathered to international partners.

Involvement and participation

Participating stakeholders functioning as main actors and being committed to collaboration were:

- Publicly funded Social Sector Knowledge Hubs, e.g. KELA (The Social Insurance Institution of Finland)
- THL (Finnish Institute for Health and Welfare)
- Health Capital Helsinki
- Helsinki Business Hub
- Terkko Health Accelerator
- Socca (The Centre of Excellence on Social Welfare in the Helsinki Metropolitan Area)
- Laurea University of Applied Sciences.

The contact with the above organisations has been consistent and has included several iterative conversations with management or with active and healthy aging (AHA) -related experts in these organisations with the aim to find specific interest

30 https://www.hel.fi/helsinki/en/administration/strategy/strategy/city-strategy/

31 https://www.espoo.fi/en-US/Espoo_to_become_a_forerunner_in_the_UN_s(144094)

32 https://www.uudenmaanliitto.fi/files/24986/Smart_specialisation_strategy_for_Helsinki-Uusimaa_Region.pdf

areas and role validation as well as finding leads to other actors´ involvement.

Pilot activities

A SWOT-analysis of the Region´s capabilities was drawn in the early stages of the Smart-up BSR project. The aim of the analysis was to find strengths and opportunities as well as weaknesses and threats for Helsinki-Uusimaa in the future. The analysis was made to give background for preparation of our new Smart Specialisation strategy. One of the findings was that we have the elements for strong RDI ecosystem, but we still need to boost the cooperation between actors and enhance the sharing of information. This piloting of mapping the information of actors on a specific field and sharing the information to be used by the actors in the ecosystem is one answer to this need.

The cross-regional activities in the Smart-up BSR -project have linked us more closely to the partnering regions. Most important has been the knowledge and personal contacts in the field of Smart Specialisation strategies that we have gained. The project has given us a wider understanding of the different ways to prepare and implement a strategy for Smart Specialisation. The local stakeholders who participated especially the representatives from the Urban Mill Innovation Platform could share their experiences of running a local innovation ecosystem and get access to new partnerships in the BSR-region. There is a great potential for future connections on the active healthy ageing -sector once the piloted mapping of actors will be further developed to be a digital tool.

The mapping decision underlines the collaboration of stakeholders based on the common goal to perform pilot measures for a holistic and cross disciplinary understanding of the Helsinki-Uusimaa AHA ecosystem stakeholders, their insight, expertise and strategic goals. This mapping pilot aims for more effective coordination of local stakeholders´ efforts hopefully leading to novel and new AHA actions, research and innovation.

Several informative encounters with professional caretakers and social health expert organizations in 2019 included discussions with relevant stakeholders which resulted in further mapping for a deeper understanding of the stakeholder network and health ecosystem.

In 2020 followed a final ecosystem mapping focused on regional active and healthy ageing actions which provided a compilation of the data and feedback. Links were made to other Nordic organisations that have interest in mapping and the related heavy work related to keeping data fresh for better interest and usability.

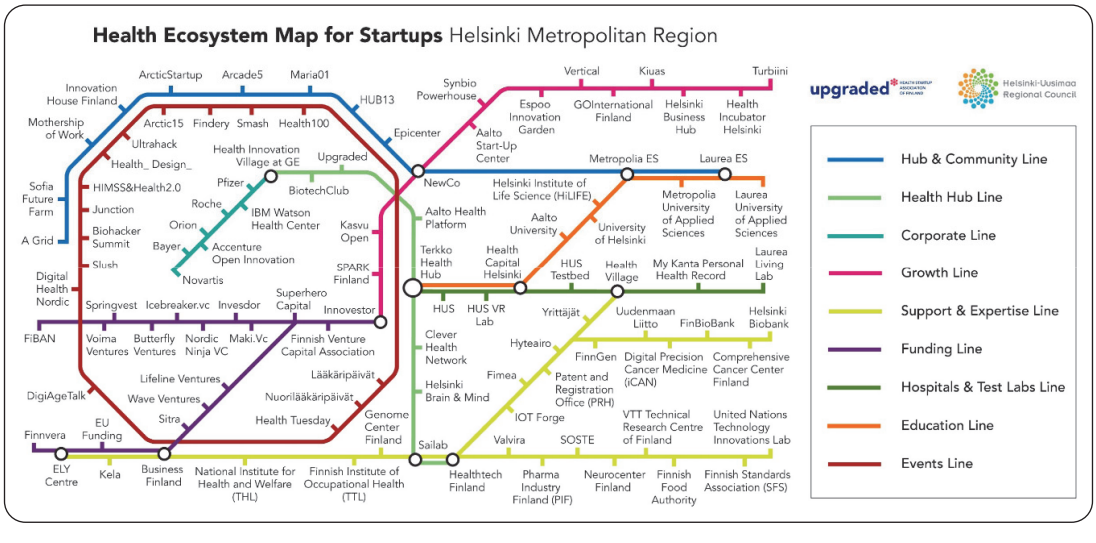

Figure 9 Helsinki-Uusimaa Region health ecosystem map for start-ups

Results

The result of the pilot was an updated view of the actors working in the sector of Active and Healthy Ageing. This includes new information on the specific fields they are working on. Without this kind of mapping our connections would be limited mainly to big companies and dominant actors. The mapping gives us a wider view that incorporates small organizations. It helps us find best ways for different stakeholders to strengthen AHA networks, to learn from each other and to form combinations of skills.

Sharing the mapping results will give the regions new visions and open collaboration possibilities on the AHA.

The pioneering impact of this pilot beyond the BSR macro region may be significant, especially if a common data model is being developed, commitment for a systematic updating of the data is established and the data would be made easily available via an internet hub or portal. We aim for moving into this direction, in conjunction with other endeavours mapping the broader Health Care (HC) actors in certain Nordic Regions and Cities.

Future Steps

The key benefits of the mapping tool and the actual ecosystem map are:

- Facilitating more coordinated and timely development approach, agenda, and priority setting
- Learning from close but currently siloed partners
- Improving and catalysing personal contacts and matching interests
- Avoiding double or suboptimal efforts.

Our original idea was to link this pilot to the work of European Innovation Partnership of Active and Healthy Ageing (EIP on AHA). During the planning process the status of our region within the partnership changed and the pilot needed to be updated accordingly. Rethinking the pilot was necessary as the City of Helsinki withdraw from the EIP AHA network as a reference site which would have benefited the linkage to the European Innovation Partnership on Active and Healthy Ageing.

One of the main learnings of this process was, that the work needs to be adequately resourced. Even when we have the information collected putting it into informative and user-friendly format requires professional skills. That is why we are still working with the final format of the mapping.

We hope to be able to have significantly wider visibility on the results by incorporating a complementary AHA - line into the broader mapping exercises we are conducting which charts organisations/services linked to ageing.

This pilot mapping gave us a view of the actors working in the sector of ageing. It also gave us information of the specific field they are working on. With this information we can develop further the orchestration of the AHA ecosystem in the region. This is also a very helpful tool in building international connections and finding right partners regionally and internationally.

In the future we need to decide how to update the mapping regularly. To gain attention, the most useful approach would be to make it available in the web. Regular updates are a known challenge for all mapping exercises, and we are keen to tackle this together with potential users and technology providers, pending of resources and interest. The current mapping will be distributed to the attention of the relevant networks and actors.

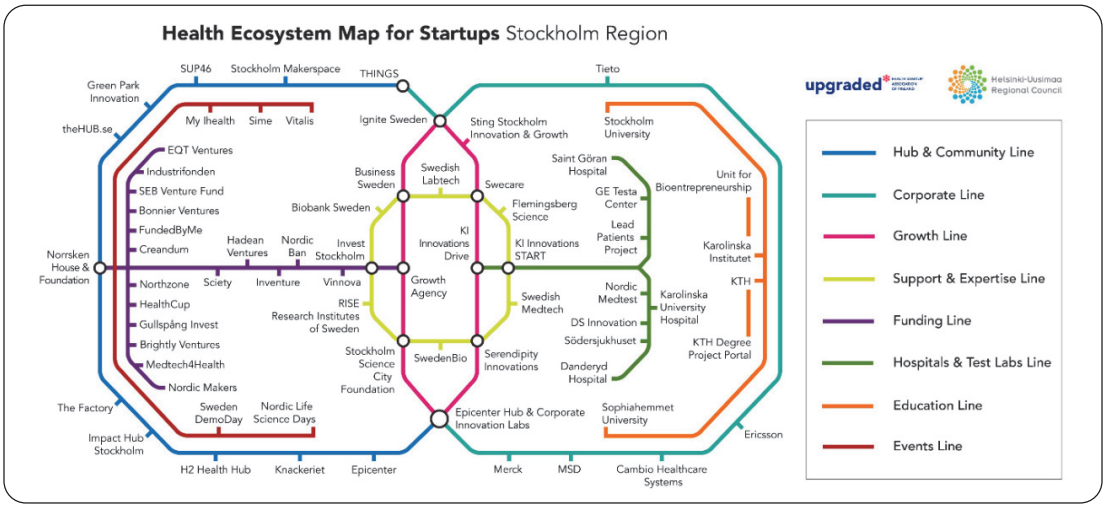

Figure 10 Stockholm Region health ecosystem map for start-ups

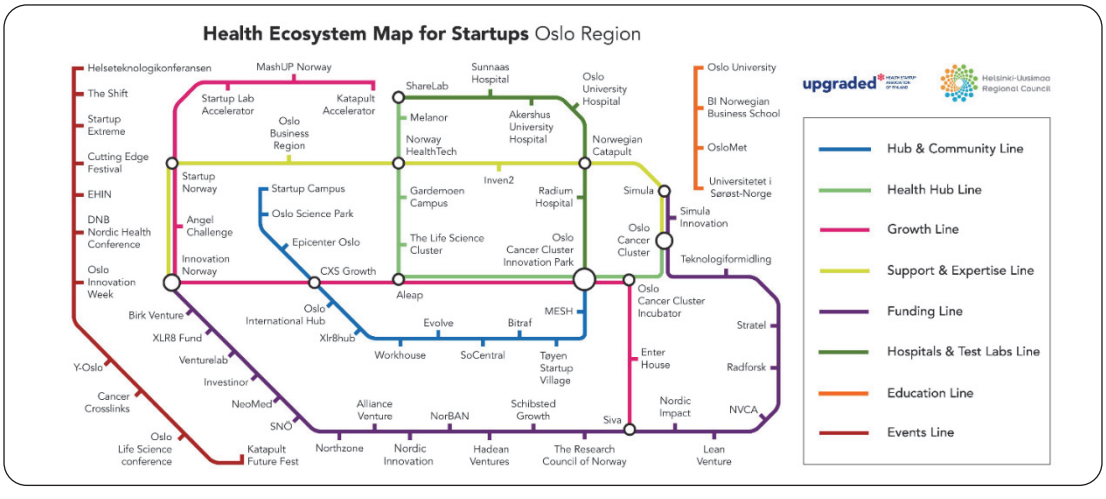

Figure 11 Oslo Region health ecosystem map for start-ups

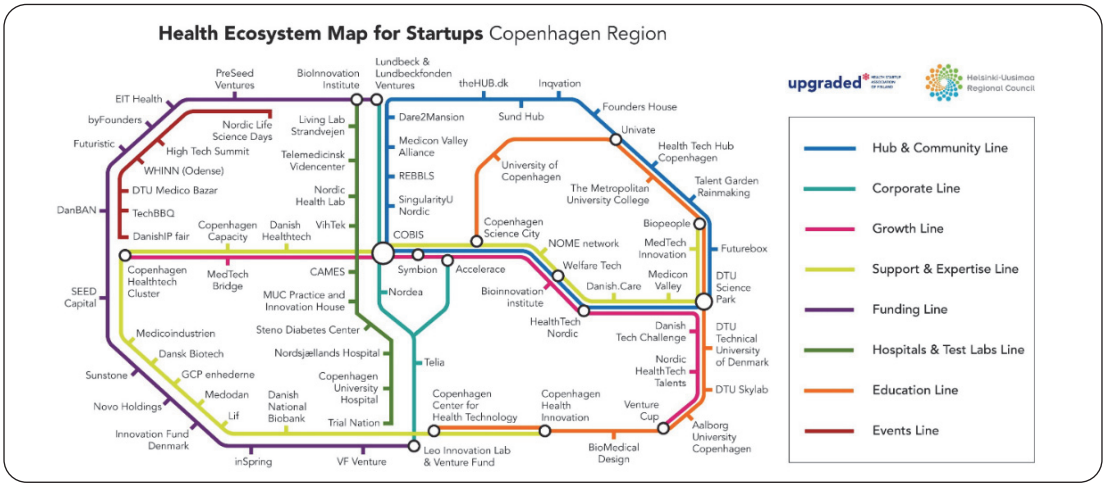

Figure 12 Copenhagen Region health ecosystem map for start-ups

Finland – Kymenlaakso Smart Ports

Importance of the pilot for the region

Kymenlaakso is a region located in the South-East of Finland on the coast of the Baltic Sea and on the Gulf of Finland. The geographical location and history have been of great importance to the region when selecting a certain spearhead. Kymenlaakso is one of the most significant forest industry clusters in Europe and an international hub of logistics and logistics related business and knowhow in the Baltic Sea Region.

Finland´s largest universal export and transshipment port, Port of Hamina-Kotka, is situated in the region as well. Kymenlaakso´s economy has relied and still relies heavily on its operating ports and port related activities (especially logistics). This is essential for the region.

Port-related activities and business have a long tradition in the region, valuable know-how and relationships have been accumulated for decades. Currently, the Kotka-Hamina port areas are being developed very strongly and new substantial investments have been brought out to the public during last few years. Lots of projects are presently going on in the Kotka old port area, which further emphasizes and increases the importance of region´s port areas and related development activities to the economic well-being of Kymenlaakso (particularly for the Southern part of the region i.e. Kotka-Hamina region).

Kymenlaakso region implemented its Smart Specialisation strategy process during 2015-2017. At the end of the process three spearheads were chosen for the region's research and innovation strategy for Smart Specialisation (RIS3) for 2016-2020:

- logistics (safety and intelligent logistics)
- bioeconomy (new products and business from resource-efficient and low-carbon bio- and circular economy)
- digitalization (cyber security and gamification and digital applications in logistics and bioeconomy as well as in tourism and health and well-being).

The development of smart ports as a sub-theme is closely related to Smart City theme. Collaborating port cities (Tallinn, Aarhus, Klaipeda, Gdansk, Kotka, Stockholm and Helsinki) are interested in this initiative within the Smart City theme.

Smart port related developments were therefore envisaged as the most suitable spearheads for Kymenlaakso's pilot project. Themes of sustainability and circular economy have begun to gain prominence in the last couple of years. A strong growing trend is that port areas attract investments in bioeconomy and renewable energy. This shows that all today´s developments and investments must have an ecological aspect to consider in some way and the Kotka port areas are putting this into practice.

A joint working group of all actors was set up in the region by Regional Council of Kymenlaakso to work on updating the Smart Specialisation strategy. In the context of this, all the existing innovation services and resources, as well as possibly lacking ones, can not only be identified and described but also brought together for action. This working group serves as a joint platform for intensified cooperation on selected strategic spearheads/ areas (e.g. establishment of joint innovative projects).

In Kymenlaakso, in the city of Kotka, a Kotka Old Port area regeneration project is a huge ongoing effort which takes a lot of time, resources and substantial investments. The overarching vision is to transform a brownfield area situated on the seaside and in the city centre to a mixed-use area in a sustainable manner. The whole area will be built and converted into a modern centre where business, university of applied sciences, development company, citizens, authorities etc.

The aim of the smart port pilot is that the region´s innovation actors will benefit from novel synergies, have access to new networks, opportunities and cooperation which are enabled by favourable surroundings, conditions and processes created by this innovation ecosystem.

Involvement and participation

The main stakeholders/ local actors of the local place-based innovation ecosystem are:

- Universities & research institutes: South-Eastern Finland University of Applied Sciences (Xamk), Kotka Maritime Research Centre
- Relevant companies (spearhead): Port of HaminaKotka, Empower Oy (regional forerunner in smart factory development), Finnhub Association (a national logistics company network).
- Public organizations, Regional Council of Kymenlaakso, the city of Kotka, Cursor Oy, Kouvola Innovation Ltd, Kymenlaakso Chamber of Commerce, entrepreneur organizations
- Civil society organizations (representing citizens/consumers): Kotka Youth Council.'

South Kymenlaakso Vocational College and Kouvola Region Vocational College are also actively developing regional ecosystem especially via regional, national and international collaboration projects.

Involvement and participation to promote three potential pilots in 2019 included:

Gisgro Port Digital Twin Project

- Representatives of Port of HaminaKotka and new port development related operators were included in cross-regional innovation camps around the theme of port development
- New participants from Finnhub association (logistics expertise and innovation network) and Empower Oy (smart city/ digital and expert service) www.empower.fi
- Both company representatives and representatives from the city of Kotka were invited to participate Portathon Baltic 2019 in Klaipėda.

Kotka Old Port Project- A Sustainable Hub by the Sea

- Cooperation project between the city of Kotka and University of Helsinki (students participated in real-life challenges / questions in innovation camps).
- Representatives from the city of Kotka were invited to participate Portathon Baltic 2019 – port technology hackathon in Klaipėda.

In addition, cross-regional collaboration in Innovation Camps led to another initiative:

Cross-border network of youth

- Collaboration with Aalto University.
- The core of the student initiative is to form a 'sub-official' group in building up a network of youth for sustainability in the BSR.
- Kotkan lyseo, a certified educational institution for sustainable development
- and local schools and youth organizations to promote the pilot idea addressing climate change and sustainability questions.

In Kymenlaakso one mechanism for engaging different stakeholders in the future is via Smart Specialisation expert working groups work (one group dedicated to certain strategic spearhead). These groups were set simultaneously with the finalisation of Smart Specialisation strategy process and the chairmanship and composition of the groups have changed several times after the initiation. This reflects the changes in the surrounding environment and the necessity to adapt to the ecosystem´s changing needs.

When thinking of the regional ecosystem´s role in supporting innovations, a certain thing stands out strongly: Kymenlaakso region is geographically a relatively small area and all the relevant innovation actors know each other quite well. The communication and contacting between actors are smooth, fast and straightforward.

Pilot activities

The methodology of pilot planning was discussed with partners (stakeholder mapping and scanning for relevant projects and initiatives). For the Kymenlaakso region possible pilots could address the development of Kotka port area and/ or "e-Kotka" (development of digital services/ solutions for people). These two were chosen because they were already existing regional initiatives which can be connected to cross-regional/EU level projects for building up synergies and increasing impact.

Finally, from Kymenlaakso´s perspective a broader theme of Smart City/ smart port was seen as the most promising priority topic for piloting

Planning for the Innovation Camp including challenge formulation started in early 2019. Helsinki-Espoo-Kotka Innovation Camp on Sustainable Baltic Sea Region 2030 took place on in Otaniemi (Espoo) and in the City of Kotka. The camp was organized by Aalto University in cooperation with Cursor Oy.

In the process of formulating challenges for the Kotka leg of the innovation camp the city of Kotka/ port of Kotka provided a real-life challenge. In collaboration with University of Helsinki´s students' different real-life problems/ themes of interest from the collaborating partners were examined.

The real-life challenge from the city of Kotka was delivered forward to student group to be worked on:

- How to combine digitalization, sea and people into sustainable business opportunities in the developing Kotka Old Port area?

The work continued with joint events including student groups and challenge owners/ partners. The final output of this collaboration was presented to challenge owners/ the representatives of the City of Kotka and other stakeholders and provided new insights and ideas on how to develop and orchestrate innovative activities in Kotka Old Port ecosystem.

Lessons learnt from previous innovation camps especially held in Aarhus/ Denmark, Klaipeda/ Lithuania and Gdansk/ Poland have been inspiring and useful in visualizing and picturing what kind of structures, operations and activities could be included in port area-related development processes and in Kotka-Hamina region. Visions for the development of the Kotka Old Port area include:

- Local entrepreneurship
  it shapes the place into a commercial form
  it gives local actors of all ages a chance to support their community
  it allows goods to be produced near-by
  it supports local sustainability
  it supports the tourism aspect.
- Extend the natural look and maintain it green
  it secures preservation of several renowned and awarded parks
  it gives local actors of all ages a chance to support their community
  it supports local sustainability
  it supports the tourism aspect.
- Sustainable city planning and development
  it secures adaptive reuse of buildings/ warehouses
  it gives a new purpose to a building and provides space for activities
  it keeps the history of that place intact, creates strong community
  it supports local sustainability.

The Kymenlaakso region´s Smart Specialisation strategy related SWOT synthesis exercise was started already in 2018. All relevant innovation actors/ stakeholders (Regional Council of Kymenlaakso, Kouvola Innovation Ltd., South-Eastern Finland University of Applied Sciences) and leaders of thematic Smart Specialisation working groups (logistics, bioeconomy and digitalization) were invited to contribute and participate in a SWOT workshop. The goal was to deploy the Smart Specialisation strategy process to forecast and better understand the region´s future development

via scenarios and SWOT analysis. The scenarios were essential tools in mapping the possibilities and risks of the region´s alternative futures and to analyse in an open and interactive co-operation the region´s strengths and weaknesses as well as opportunities for further development.[33]

The resulting characteristics for Kymenlaakso region were:

- forests and bioeconomy-based products (=S),
- structural change region and unfavourable population structure (=W),
- expertise in utilizing digitalisation and tourism (=O),
- weak/low competence base and outmigration to growth centres (=T).

This exercise showed regional strengths and opportunities and most importantly weaknesses and threats which need specific attention and building of new competence and collaboration. With this exercise it was possible to analyse what kind of competences should be fostered and developed internally and externally in order to manage in the future.

The SWOT workshop and its findings was a good starting point and a boost for Kymenlaakso region to revisit its Smart Specialisation strategy, review critically the validity of the strategy and assess the need to update it. A concrete result was to take preliminary steps in discussing and planning on how to proceed with the process of strategy update: who to involve and how to ensure that relevant input from specific innovation actors will be received.

It was decided that all three Smart Specialisation expert working groups should be gathered together to share views and experiences from past operations and activities in a varied group of representatives. 19 representatives participated from Cursor Oy (six), South-Eastern Finland University of Applied Sciences (six), Kouvola Innovation Ltd. (=region´s other development company in the north; two), Kotka Maritime Research Centre (one), company representatives (two), and representatives from Regional Council of Kymenlaakso (two). This updating process was planned to be a joint effort engaging region´s all relevant innovation actors. The process coordinator and orchestrator is the Regional Council of Kymenlaakso.

Finally, the region dedicated some efforts to activities towards establishing the BSR Youth Network pilot:

- 2019, discussions with Aalto University about building and planning the network, possible target groups and action plan for proceeding before approaching regional parties (e.g. high schools/ teachers) with a concrete and attractive “offering”.
- Kymenlaakso’s most promising school to recruit into the pilot Baltic Sea Region Area Youth Network was Kotkan lyseo, a certified educational institution for sustainable development.
- Partners were asked by Aalto team to get in contact with local schools and youth organizations and promote the pilot idea addressing climate change and sustainability questions.
- 2020 the youth council of the city of Kotka was approached to join the Riga innovation camp.
- Kymenlaakso widely disseminated the BSR Youth Survey to local educational institutions, where the target age group of the survey can be found.

33 The 5 different scenarios (1: Protectionism and traditional government power, 2: Polarized individualism and expert power, 3: Reliance on local communities, 4: Global and networked tech-imperialism and 5: Growth and EU-driven international co-operation) were based on the synthesis work done by all Smart-Up BSR project partners. These different scenarios describe alternative future developments in the operation environments by 2050.

Results

The port-related piloting benefited the local innovation ecosystem in the following ways:

- Links to new partners operators that bring added value and competence
- New expertise for the local innovation ecosystem especially relating to port area.
- Boost to the exploitation of new smart/ digital services and applications.
- Upgrade of ICT/ digital operating environment in port area.
- Increase of the role of ports in maintaining and attracting new industries and logistic activities to region.

The engagement of University of Helsinki´s students on the project 'Kotka Old Port - A Sustainable Hub by the Sea' emphasized the need to improve accessibility to other relevant areas in Kotka, e.g. the urban national park and the unique features of a city by the sea. The work presented several concrete ideas with which to enrich and enliven the port area with innovative sustainable entrepreneurship.

The role of local entrepreneurship was emphasized because it can really shape the port area into a commercial form while giving the locals a chance to support their community and get goods produced nearby. This also supports the tourism business aspect. Sustainability was highlighted in all city planning and development. This could be realized e.g. via adaptive reuse of buildings/ warehouses which could give new purpose/ life to old buildings and provide space for new activities and business. From cultural and excitement point of view new events that get the attention of people and create good memories could be organized (pop-up events such as restaurant days, start-up activities, circular economy and collaborative consumption related functions).

Port of HaminaKotka presented their novel Gisgro Port Digital Twin Project demonstrating 3D model of the port areas for maintenance of the underwater and surface structures. This was perceived as a possible case that could be utilised for cross-regional pilot planning i.e. introduced and piloted also in other partner regions. Initiatives were made to match interested parties from e.g. Poland and Lithuania with Port of HaminaKotka representatives.

Noticeably the city of Kotka has taken a more active role as an enabler in regional ecosystem. In Kymenlaakso region an excellent example of a city being an enabler is Kotka Old Port regeneration project which was tied up with the planning and execution of a cross-regional Innovation Camp. The city has been an orchestrator for innovative projects and a co-creator and tester of innovations. Some of the activities have been inspired by the Smart-up BSR project.

From the region's point of view the piloting exercise boosted the use of Smart Specialisation strategy in a concrete way. The interactive tools gave an excellent opportunity to train predicting future scenarios, pinpoint specific development needs, develop strategic foresight thinking and intensify co-operation and interaction with region´s different innovation actors. From Kymenlaakso´s perspective lacking regional competences could be complemented with collaborating especially with project partners from port cities.

In the youth network collaboration pilot, ideas for a cross-border network to connect youth in BSR and increase youth influence and collaboration on sustainability issues were still very fragmented to be provided to further stakeholders. With a clearer plan and goal the youth network can expand to proceed regionally.

Future steps

Some lessons learned during pilot planning of the pilot from the organiser's point of view:

- it has been tricky in the beginning to figure out the essentials of pilot planning.
- projects with earmarked budget to execute new pilots are easier when selling the idea to potential regional pilot partners
- finding out which already ongoing development plans/ initiatives in BSR and which expertise would bring added value to the region requires a lot time.

As far as challenge owners (especially land use planning) were concerned, they were very interested in exploiting the work results in their future work, though currently there is no suitable ongoing project to implement the Kotka Old Port Project idea presented by the students. The idea is though well remembered, and it has strong potential to be utilized via temporary use of the Port area.

The development of the port related pilots could have progressed faster if overlapping obligations could have been avoided among the region's relevant actors; due to pressing pilot schedules the program and challenges of the innovation camps were communicated on short notice. However, the development of the area is a multi-year process and e.g. the vacant warehouse buildings in the area offer testing opportunities for many activities. Presently COVID-19 pandemic has affected heavily on region´s port activities and operators and promoting cross-regional pilot cooperation is delayed.

Promoting and participating in cross-border network of youth pilot seems instead to carry a lot of potential. COVID-19 pandemic naturally hinders physical meetings, but pilot leaders are striving to arrange video conferencing to include numerous participants from BSR countries. We hope, that the youth council of the city of Kotka will engage in dialogue with the cross-regional youth network since the city of Kotka is in the middle of the updating process of its climate program for the coming decades and also the youth council will be involved to this process.

Projects have traditionally been the most important means of regional development in Kymenlaakso region. Nowadays access to structural funding is constantly tightening and competition for funding between different actors is also becoming more intense. International cooperation and joint projects will play even a bigger role in the future.

Latvia – Regional Capacity Building

In Latvia, a pilot was conducted by the University of Latvia (UL) and also by the Ministry of Education and Science (MoES).

MoES – Importance of the pilot for the region

The Latvian Ministry of Education and Science (MoES) has the role of fostering an innovative, wealthy and integrated society in which everyone has equal opportunities for development, therefore the goal of the Latvian pilot was to ensure that Smart Specialisation strategy is implemented successfully.

MoES' pilot aims at supporting partners and establishing necessary amendments to the existing Smart Specialisation strategy and implementation plan by doing close and accurate monitoring. This is done by facilitating dialogue with the stakeholders, by sharing information and providing extensive explanation to the relevant policies and participating in all stages of decision making.

Latvia is progressing towards a globally connected R&I system. Comparing to other EU countries, Latvia has a weak track record in R&I, though it can currently boast with what can be considered islands of excellence. Still, relatively weak links with industry need to be improved. R&D systems are still passive and re-active in steering socio-economic impact. Therefore, the decision to engage with this pilot was to learn from others and work on new approaches where possible.

Latvia envisioned an economic but also social impact as outcome of the project and a better support in the implementation of the Smart Specialisation national framework.

Capacity building was a main focus. For example, expectations were directed towards better solutions for closing skills gaps, or to better management of water resources, or to improved education and links between the academic and the business communities by sharing an interdisciplinary circular economy approach.

Involvement and participation

The Triple Helix approach was tested, and the main target groups were R&D institutions, higher education institutions, entrepreneurs, municipalities and other ministries.

The methods used to promote, advertise, recruit, create awareness were: Support and discussions with universities, research centres, businesses other public bodies.

We proactively tried to communicate and collaborate with relevant stakeholders, especially stakeholders that were interested and had regional or sector specific knowledge, expertise or experiences helpful for Smart Specialisation national strategy implementation and monitoring. Universities, research centres, businesses, municipalities and other ministries participated in the activities.

Pilot activities

MoES took part in several encounters and interventions, by participating in numerous meetings with national and regional stakeholders (municipalities, ministries, scientific and research institutions, universities and businesses).

Activities focused on leading a dialog on issues of implementation and capacity building to secure its success. The various meetings discussed aspects of circular economy, bioeconomy, IT advancements, technology transfer and other new initiatives, programs and projects that can be used for better implementation of the national Smart Specialisation strategy.

The activities included supporting other partners in Latvia involved in pilot projects linked to the Smart Specialisation national framework.

Results

The Smart-up BSR pilot allowed us to expand the existing network with regional level stakeholders, but also to engage and support other partners from Latvia. For example, we supported the University of

Latvia and the University of Liepaja in linking their pilot projects to the Smart Specialisation national framework. Thus, we paid more attention to directions like Smart Cities (advanced IT) and circular economy (knowledge intensive bioeconomy).

By participating in the innovation camps, the Smart-up project manager and Smart Specialisation experts from MoES gained insights and knowledge based on societal challenges which need to be considered when performing the monitoring of Latvian Smart Specialisation strategy and implementation of related activities.

A major outcome of the pilot was to learn different practices around the Baltic Sea in Smart Specialisation planning and implementation, regional capacity building and also to establish new networks.

Cross-regional cooperation was very relevant to learn practices in other countries and regions, as well as to discuss further cooperation and new project opportunities.

For the MoES cross-regional cooperation is important because investment as well as policy focusing on R&D aims towards international collaboration to ensure competitiveness and excellence through technology and knowledge transfer.

International collaboration is also needed for sufficient human capital in R&D to foster economic transformation. Therefore R&D capacity development in academic, science and business sectors are aligned with Smart Specialisation priorities.

Future steps

Sector specific information regularly needs to be updated and monitored in at least the regional context to achieve better and more accurate focus and ensure engagement with all the stakeholders (policy makers, R&D sector, entrepreneurs, students and general public), providing updates on challenges and opportunities.

Currently, MoES is working on new policy planning document that will revise and update existing Smart Specialisation strategies for next funding period. The Smart Specialisation strategy for Latvia is already in its implementation phase, but after its revision it is very likely that implementation of related activities will be changed accordingly.

With each innovation camp MoES experts gain new experience on how to tackle different aspects of Smart Specialisation development and implementation, e.g. societal challenges in the region, ways of establishing dialogue between stakeholders, coordinating the bottom-up process, etc.

Latvia aims for higher degree of international co-operation for improvement of position among EU innovators and actual impact of the research, as well as more successful cooperation in international project openings.

The future impacts for the Baltic Sea Region are: Cooperation for new project applications (e.g. in circular economy sector) and networking, new contacts.

University of Latvia – Importance of the pilot for the region

The University of Latvia (UL) is the leading national most influential university in Latvia and therefore has an important role in the development of the education system as well as the economics of Latvia. UL has chosen the House of Technology as a Smart-Up BSR pilot. The activity is part of the development of the UL Academic Centre which started in 2004 with the endorsement of the University's "Development Strategy 2004-2010". The Academic Centre implementation is carried out in three stages: first, building of the house of Nature (2015), second the House of Sciences (2019) and the House of Letters (to be completed in 2023). Stage three projects of the Academic Centre development programme include such projects as:

- House of Health – an outpatient care, study and research complex, including the family doctors Competency Centre and the Sports Science Centre;
- House of Technologies – Life Science, Material Sciences and High Energy Radiation Technology Centre;
- House of Champions – sports complex, sports science and functional medical centre;
- House of Students and Guests – student dormitories and social support infrastructure, apartments for employees, guest lecturers and guest researchers.

The House of Technology project represents a concept of the technology transfer centre fostering development of innovations in three main specialisation fields according UL Smart Specialisation directions (Radiation chemistry and physics; Materials, mechanics and prototyping centre; Life Science centre).

The House of Technology is intended as a pilot project ("city within city") that implements Smart City guidelines (smart energy supply and measurement, open data, smart lightning, smart mobility). Afterwards, the concept is planned to multiply to other buildings of the campus and on the next level - to the market.

It was recognized that the technology centre must be modular in order to be able to accommodate new directions. This concept came from working with the longlist of proposed equipment. A method for evaluating the potential of the proposed directions of research and proposed list of equipment was devised. Thus, the concept is developed to be able to validate unnumbered different scientific directions/units and to prove their viability and marketability.

This includes both the financial (returns, payback estimates) and non-financial criteria (market response, fit with strategies, synergies with other directions).

The approach to the project was tightly related to the roadmap set forth by the regional (Latvia) Smart Specialisation strategies on the one hand and to the specific needs and goals of involved stakeholders. The House of Technologies addresses these by creating infrastructure and organisational platform for technology transfer. Also, in Latvia, the Smart Specialisation strategy corresponds with the national research and innovation strategy for economic transformation.

The core criteria for allocation of public resources reflect the local policies and the public preferences. These criteria were considered as a basic validation of the direction envisaged by the House of Technologies. The criteria among others include:

- Growth of S&T human capital (knowledge and networks), expressed as increased
- Competence of individuals engaged in projects and opportunities to increase multidisciplinary research and innovations and an increase in research capacity through university graduates;
- Scientific excellence, characterized by the level of usefulness of new knowledge for future or present economic and societal challenges;
- Net economic value or today's financial and social benefits that project will create.
- As for the perspective of the owner of the initiative and the pilot of the House of Technology the project was built to align with the strategic intents of the of University, which include:
- Improving its competitiveness within BSR region through its scientific institutes
- Raising the potential and governance of the intellectual property
- Increasing the international reputation and ratings.

Involvement and participation

A number of different groups of stakeholders were included in the development of the pilot. The scientist affiliated with the University of Latvia camp up with more than 150 different ideas suitable for the project.

Local and regional expert were employed to evaluate both the substance of the ideas and also the financial and commercial assumptions behind the proposed ideas.

A further challenge includes finding a way to coordinate various similar initiatives over the BSR with an aim to eliminate ineffective use of scientific equipment and allocation of resources. The concept of specialisation (and Smart Specialisation) could be a way forward, so that each hub of technology transfer within the region would be much aware of the general direction chosen by other players.

Pilot activities

The Smart-Up BSR innovation camp held in Riga in February 2020 addressed several issues, the solutions of which were directly related to the pilot project of the House of Technologies.

- "Long-term cooperation between business, academia and public sector to foster innovation". The group challenged the Triple Helix -model based challenge setting by adding citizens to the challenge, just like theorized in the Quadruple Helix model. One of the key findings for how to keep the system running as smoothly and efficiently as possible is to increase TRUST between the different players.
- "Promoting the communication between the holders and users of the science infrastructure". Part of the challenge could be solved by developing new department in the universities which combine all the infrastructure, researcher contacts and is responsible for infrastructure usage, sharing, maintenance and services.
- "How to help the innovations to leave the scientific laboratories and interact with commercial sector and society." The challenge was specified, and three area of issues emerged: Motivation of scientists to attempt commercialisation of their innovations, organisational and physical infrastructure improvement, maximising the market. Surveying scientists for ideas (scouting technologies) was identified as the very first step. This would enable creating collaboration platforms, creating databases of research initiatives and investor requests, organising informal gatherings and ongoing expos of certain technology.

Parallel to the Smart-Up BSR Innovation camp a conference "Innovation – power of the 21st century" was held. This resulted in signing of a "Riga declaration" which emphasizes the cooperation of the signing parties in the fields of 3S strategies, development of knowledge-based society and

economy and cooperation in an innovation-friendly economic environment.

Based on the recommendations of the European Investment Bank regarding the need to create the Innovation Centre House of Technology within the University of Latvia Academic Centre as a regional innovation centre, and on the Riga declaration Latvia together with BSR partners should develop a targeted financial platform for development of innovations from technology readiness level (TRL) 3-4 to TRL7.

The platform established by Riga declaration would help both for pooling financial resources and also creating networks of competencies, which is important for successful realisation of the House of Technologies.

The following activities in the House of Technology pilot project were carried out:

- The longlist of proposed research ideas and required equipment was created and market research conducted in order to determine supply/demand for research services, and to establish the most optimal use of the equipment and the required investment amount.
- A series of meetings was conducted with the research personnel and external consultants to identify and analyse the research services needs and what are the underlying and associated costs, and possible revenues streams.
- With participation of external experts and consultants the feasibility study and funding model of the House of Technology has been prepared.
- The strategic model for operating the House of Technology has been prepared (including the organisational structure within the structure of the University and the congruence with university's strategic goals).
- A high-level strategic outline of the commercialisation strategy (including the identification and protection of intellectual property rights) has been prepared

Results

The pilot strategy of the House of Technologies has already had an impact on various levels, starting from the very local level of the University. There the preparation of the concept has worked greatly to structure the various scientific ideas and initiatives. More than 150 different ideas were scrutinised, grouped and evaluated. Also, the project itself has stimulated the scientific personnel to shift their perspective and accommodate the view of commercialisation of their scientific work.

On the country level and the level of the region the pilot project of the House of Technologies has had a certain impetus on the process of technological commercialisation and has been received as a role model on how to stimulate the transfer of technologies.

In general, it is expected that the House of Technologies would have an impact on the following indicators:

- New channels of income from research services such as licencing of intellectual properties, increasing competitiveness of new project proposals, attracting new scientific personnel
- Improved technology transfer by increasing the technology readiness level of inventions
- Increased innovations and inventions with higher value added
- Improved quality and quantity of scientific publications

Future steps

The next steps in the process of the development of the pilot include:

- Attracting finance
- Finding the right legal framework (protection of intellectual rights, commercialisation)
- Building, procuring equipment
- Business plan implementation and control

Lithuania – Smart, Green and Integrated Transport in Smart Ports

Importance of the pilot for the region

In 2014 the Government of the Republic of Lithuania approved the Smart Specialization strategy programme in which Lithuania, like other European Union countries, has set its RDI priorities. This was done considering existing or potential competitive advantage. Priority directions for RDI were determined by analysing the potential of business and research in Lithuania, including human capital.

Klaipeda region has no separate Smart Specialisation strategy and it is a part of Lithuanian national strategy. The region needs to ensure that its interests are reflected in the national strategy, which provides a framework document for governmental investments.

Therefore, it was important to find the way how the engagement of maritime value chain (policy makers scientists and investors of the region), could help to shape Lithuania's Smart Specialisation strategy. In practice the aim is to reach a consensus on the industry transformation priorities and on channelling the resources for strategy implementation. In addition, the maritime industry is diversified, thus in order to lobby for regional priorities the local policy makers must reach a consensus about the selected regional priorities.

In the Initial Smart Specialisation strategy, the transport sector and the marine sector were not included as a separate priority. With consideration of the importance and potential of the sectors to Lithuania, and Klaipeda in particular, the Klaipeda Science and Technology Park (KSTP) and the Agency for Science, Innovation and Technology (MITA), decided to proceed with developing initiatives that might contribute to the development and visibility of these sectors with the help of Smart-up BSR project pilot activities.

By implementing the Smart-Up BSR activities partners agreed to concentrate efforts on including transport as a priority of the Smart Specialization Programme. In addition, the pilot ideas were guided the smart city mission, which serves the objective to promote cities to provide core infrastructure and give a decent quality of life to its citizens by a clean and sustainable environment and the application of 'Smart' Solutions.

This led to implementing the pilot "Smart Port" within the smart city theme. The strategic intent was to run a case to show how much potential there is in the sector, and how many goals Lithuania can achieve by investing and developing the smart transport sector.

Stakeholders also agreed to propose an additional priority in the updated version of the Programme on the Implementation of the Priority Areas of Research and (Socio-Cultural) Development and Innovation (Smart Specialization). This means extending the priority on transport to "Smart, Green and Integrated Transport".

The pilot's main task is to analyse the current situation of ports, their challenges, the technologies applied in the port and generate ideas, prototypes, solutions for port digitization and automation processes with the help of target groups.

Activities of the pilot project aim at creating a network of maritime innovators as well as developing unique solutions for maritime cities/ regions that can be used not only in harbours and by companies who operate in ports, but also for universities to establish new pragmas, and for both Naval Forces and civil needs.

Strategic Intent

As digitization and automation are crucial in the development of maritime technologies, they have recently become a hot topic among companies and organizations in the global maritime supply chain. While the EU is still leading the maritime development globally, the challenge for regions like Klaipeda is to find the way to benefit on being frontrunners in the application of new technologies, gaining enough knowledge and capacity to transform local maritime industries to a higher added value products and services.

The challenge in the digitalization and automation of the Maritime industry is hidden in

the scale. It was also important to have support and benefit from the legacy of different stakeholders who are involved in high-level discussions.

The active involvement of the Klaipeda Port authority in the process was promising, as this organization also is taking ownership of the challenge and seeks solutions. Companies, related to port industries, must grow from port cargo handling companies to innovative equipment producers, while shipyards need to step into the industry of autonomous shipping technology suppliers.

Klaipeda region brought forward the regional challenges in their effort to become a competitive and sustainable port and an important part of Lithuanian national economy. The challenges identified are:

- How to flexibly transform local maritime industries to be in tune with global digitization and automation trends?
- How to find the region's own niche and competitive advantage?
- How to reach stakeholder consensus locally and lobby at a national level?

Involvement and participation

Klaipeda Science and Technology Park (KSTP) and the Agency for Science, Innovation and Technology (MITA) promote business and science cooperation, commercialization of research and aim to stimulate applied research, technological development and innovation in Lithuania. KSTP and MITA, compiled a list of stakeholders that could be relevant in the process of Smart Specialisation planning and implementation.

In order to reach the targeted audience a wide network of BSR cross-regional partners were engaged. The invitations to the events were spread through BSR Port authorities and other interested parties. The wide interest in the pilot gathered a wide network of associated partners such as: JSC Klaipėdos Nafta (KN), Embassy of the Kingdom of the Netherlands in Lithuania, Lithuanian LNG cluster, Klaipeda State Seaport Authority, Lithuanian Naval Force, Ministry of National Defence, Enterprise Lithuania, Kaunas University of Technology, Klaipeda University, Vilnius Gediminas Technical University, Baltic Tech Park.

Smart Port pilot events were open for all who were interested in generating new ideas, have a solution on how to solve challenges, looking for new contacts and networks. We received registrations from various countries, not only from the BSR – this showed us that our set challenges are important also internationally.

The pilot events attracted participants from Poland, Sweden, Germany, Belgium, Norway, Denmark, Netherlands. There were representatives from Port authorities, Clusters, International companies, start-ups, new technology providers, students and scientists. Representatives of international companies were attracted to participate in this pilot as experts and as mentors as well.

Pilot activities

Meetings with politicians, business and academia representatives were organised and SWOT analyses of Lithuania and the Klaipėda region were prepared. It was agreed that the main strengths of the region consist in the strategic location of Lithuania, the well-developed transport and logistic networks, as well as the advantages of Klaipeda Sea Port. Nevertheless, it was noticed that these strengths and potentials that might benefit the region, were not prioritized in the strategy documents.

To implement The Pilot activities Lithuanian partners organized meetings with regional stakeholders, cluster representatives, universities and other projects partners.

To achieve the goals set for the pilot various events were organised which created the conditions for and strengthened the cooperation between public and private sectors. New solutions in digitalization, automatization, and smart transport ecosystems and safety are very important for all BSR ports. So, Lithuanian partners agreed that the pilot for Smart city – Smart Port would consist of three different events:

LNG forum 2019

- Event organized on 15-16 May 2019 in Klaipėda, Lithuania.
- Partners: Lithuanian LNG cluster, KSTP, JSC Klaipėdos Nafta (KN), Embassy of the Kingdom of the Netherlands in Lithuania.
- Participants: Representatives from Poland, Sweden, Germany, Belgium, Norway, Denmark, the Netherlands and Lithuania. 200 participants, 8 countries, 26 speakers
- Goal: to present and share experience about new, innovative technologies and services that are developed in BSR and provide a full overview of the LNG application and perspectives, ranging from LNG road and railway transport to the maritime and inland waterway sector. Sustainable LNG and liquefied biogas (LBG) infrastructure development.

Portathon Baltic 2019

- Event that gathered many parts of smart maritime innovation ecosystem and contributed to development of concrete solutions. Organised on 20-22 September 2019, Klaipėda, Lithuania.
- Partners: Lithuanian LNG cluster, Klaipėda Science and Technology Park (KSTP), Gdansk-Gdynia-Sopot Metropolitan Area, Agency for Science, Innovation and Technology (MITA), Klaipeda State Seaport Authority.
- Participants: Representatives from Sweden, Germany, Netherlands and Lithuania. 80 participants, 4 countries, 12 mentors, 18 teams and solutions.
- Goal: to generate ideas and prototypes that could be adapted in developing smart transport ecosystems and in the logistics sector through automation and digitalization of port terminal facilities and various processes; to increase port efficiency and do impact for port environment regarding SDG.

Delta Navy – Military Tech Hackathon

- Event engaging citizens and stakeholders of the locally based ecosystem to take active role in the development of new technologies, related to safety and security, Organised on 25-27 October 2019 Klaipėda, Lithuania.
- Partners: Lithuanian Naval Force; MITA, Ministry of National Defence, Enterprise Lithuania, Kaunas University of Technology, Klaipeda University, Vilnius Gediminas Technical University, Baltic Tech Park, Klaipeda Science and Technology Park.
- Participants: 50 participants, 26 mentors, 11 teams and solutions. Considering the specific maritime smart city topic, Delta Navy Hackathon was held in a Lithuanian Naval Force headquarters and supply ship "Jotvingis". Due to the sensitivity of the field of potential new applications, Delta Navy Hackathon organizers had to organize the selection of potential participants in a two steps selection and preparation procedure to form teams and to acquaint selected participants with the tasks.
- Goal: to generate ideas and prototypes that could be adapted in the Navy; to encourage the development of advanced products that require the highest military requirements; to bring people from different fields for the same purpose - to strengthen the Navy and development of solutions, that might be used for civil purposes of safety and security.

Discussions focused around many different notions, such as autonomous ships, fully automated ports, digitized shipping information and documentation, automatic monitoring of vessels and equipment, among other sectoral issues. This led to the identification of the main questions for a mini Innovation camp in Lithuania, Palanga:

- How can a smart city connect and support a smart region?

To do this work international experience and best practices were needed which could be accessed by interacting with Smart up BSR network partners.

The Mini-Camp started with a visit to Western Baltija Shipyard to get insights on maritime industry development at Klaipeda region. The working group on Klaipeda regional challenge outlined the importance of joining different key actors to promote and work with the maritime industry. By attracting a critical mass, the maritime industry would be considered in the national Smart Specialization strategy. The working group developed a roadmap for linking maritime industry to Smart Specialisation priority areas:

1. Finding key players;
2. Preparing pitches for industries connected with the maritime sector
3. Business cases
4. Clustering
5. Changing mindsets: e.g. by shock therapy – what if Lithuania had NO maritime industry?

This developed roadmap, based on the experience of participants and experts who attended the innovation camp, provided a start to implement pilot activities.

"Portathon Baltic 2019" (20-22 September 2019) brought together professionals and technology enthusiasts of different competencies in the environment open to creativity in order to generate ideas and prototypes applicable in the logistics sector by automating and digitalizing port terminal equipment and various processes as well as developing smart transport ecosystems. The challenge was accepted by 80 participants from 4 countries – Lithuania, Netherlands, Sweden and Germany.

Delta Navy Hackathon (25-27 October 2019) was very successful, attracted more than 80 participants and created a list of very competitive solutions, that got attention from investors, who participated in the event.

With the involvement of main stakeholders of the maritime ecosystem, IT/engineering field experts, and qualified citizens, innovations were created to improve safety and living standard of the population by creating the following solutions:

- Personnel monitoring system,
- Laser communication,
- Search/environmental analysis drone.

The first price at Delta Navy Hackathon was assigned to the team „VGTU-AGAI2", that created unique solutions for laser-based communication system, These solutions are highly applicable for the use of safety and security in port areas, for example for communication between the ships where radio connection is not possible. Involvement of scientists and specialists from different fields in the creation of new products for smart ports is crucial for proving the efficient functioning of innovation ecosystem.

Results

After scanning existing initiatives and ideas for projects with the intention to create synergy and larger regional impact as well as with the aim to identify the steps for achieving bigger impact in the BSR region, the goals for the Smart City – Smart Port pilot project were set to:

- generate prototypes that could be adapted in developing smart transport ecosystems and in the logistics sector through automation and digitalization of port terminal facilities, safety and various processes
- increase port efficiency
- impact the port environment regarding SDG;
- promote autonomous port vision by increasing digitalization and automation processes in Klaipeda port and among all port terminals, stakeholders and companies in BSR;
- encourage the creation of teams of innovators interested in the newest technologies for port safety and applications in Naval Forces.

Implementation of pilot projects, stakeholder engagement and diverse operational activities in the region were the key factors in moving the Smart Specialization approach to the centre of the regional transformation processes.

As active engagement of target groups and ecosystem stakeholders in the activities organized is also essential for the success of implementing Smart Specialization policies, the pilot consists a valuable example in practice. Numbers of participants in the events shows motivation and commitment, that are also key facets of the mindset, needed to elaborate future transformation processes. However, more efforts are still needed in terms of creating a cross-regional critical mass.

The Smart City – Smart Port Pilot was useful for Klaipeda Sea Port authority and Klaipeda region. By implementing the Pilot, all parties – science, business and municipality could exchange their vision of smart port. Klaipeda Port authority identified their advantages and weaknesses comparing with other BSR ports. Klaipeda region accepted the main goal of the Port to become autonomous port.

Pilot activities facilitated increase of certain knowledge among KSTP and MITA. Representatives from MITA gained very interesting knowledge and experiences how to co-organize and take active part (as mentors and experts) in hackathons, encourage building of quite unique innovation ecosystem in quite closed and specific navy sector, evaluating possibilities to adopt new solutions, proposed by the winners of Delta Navy Hackathon to Port and Smart City areas.

Another result is the increased awareness of regional representatives from private and public sectors as well as citizens, about what it means to be the part of a place-based innovation ecosystem and Smart Specialization process. This improved the understanding of the benefits of actual participation and raised the level of motivation for taking active and constructive steps in the processes.

Pilot activities provided also very practical experience and skills on how to organize events, engage different stakeholders, find various challenge angles that would motivate participants to take active role in the processes.

In addition, pilot projects enhanced commitment, helped to build new skills and competencies for organizers and co-organizers of events - KSTP and MITA. Their role as key player uniting stakeholders of maritime sector in the region was established. Both institutions gained competencies in many different areas: use of new innovative tools and ecosystem thinking, encouragement of the emerging place-based ecosystem, transnational cooperation and open innovation processes, mindset of experimentation and change management instruments to assure the transfer of best practices into activities implemented.

The process of pilot projects implementation brought several important achievements:

An updated version of the Programme on the Implementation of the Priority Areas of Research and (Socio-Cultural) Development and Innovation (Smart Specialization) and their Priorities was approved on July 24, 2019 by the Resolution of the Government of the Republic of Lithuania No 760. This was possible thanks to the efforts of stakeholders and key players. Being able to show the potential of smart and integrated transport activities led to including the separate priority for Smart, Green and Integrated Transport in the updated version of the Programme.

Pilot activities also increased the awareness of regional representatives from the private and public sectors, as well as of citizens, about what does it mean to be the part of place-based innovation ecosystem and Smart Specialization process. Also, their understanding of the benefits of actual participation improved, which raised the level of motivation in taking active and constructive steps in the processes.

Organizing Hackathons as a form of implementing cooperation became a popular and effective way to bring all interested parties in one place to find needed solutions. Partners in Lithuania wanted to apply this form of events (hackathon) for the Smart city sector with the focus on the development of solutions, prototypes related to autonomous port, digitalization and automation processes, safety and living standards of the population in the Port area.

Pilot projects enhanced commitment, helped to build new skills and competencies for organizers and co-organizers of events -KSTP and MITA. Both institutions gained competencies in many different areas: use of new innovative tools (Hackathons) and ecosystem thinking for encouragement of emerging place-based ecosystem, transnational cooperation and open innovation processes, mindset of experimentation and change management instruments to assure the transfer of best practices into activities implemented. Project pilot activities also helped KSTP to increase their role as key player, uniting stakeholders of maritime sector in the region.

Impact for BSR region: Activities of the Pilot project helped to create a network of maritime innovators as well as to develop unique solutions for maritime cities/regions. This directly related to the implementation of Smart Specialisation in the region. The emergence of new solutions for autonomous ports, safety, and security, strengthens the competitiveness of the BSR region and contributes to the collaboration of harbour cities in the whole BSR.

The Smart-Up BSR project created an active network of experts from three Baltic ports: Klaipeda, Kotka and Gdansk-Sopot-Gdynia, who shared their knowledge and insights about possible solutions to existing challenges, ways to encourage the emergence of innovative ecosystems in the ports. Active cooperation between Smart-Up BSR project partners, openness and sharing of knowledge about innovative solutions, elaborated in the pilot actions, might be implemented internationally and could lead to the development of Smart ports network in whole Baltic See region.

Future Steps

All pilot projects were good examples that helped to test the existing innovation ecosystem: by testing networks and cooperation between different stakeholders, the response of science and businesspeople, the legal framework as well as potential financing instruments to be offered to the teams in all stages of product development.

The competencies acquired will guide future action. The main lessons learned from the piloting actions emphasise:

- the need for more focus on experimental development and innovation;
- closer and consistent networking with mentors and experts;
- the improvement of financial motivation systems for RDI activities and for attracting of professional mentors/ experts to work with the teams.

The pilot showed that currently working at international level is still challenging for many innovative companies. In the future they need to be prepared to take advantage of emerging opportunities.

It was very useful to hear different opinions from large international companies about experiences gained during participation in pilot activities. But at the same time some companies reflected about the reasons to refuse participation in the events. Future activities need to resolve the fact that there is still a lot of fear to share own ideas and to participate in the brainstorming and creation of new prototypes.

The wide range of solutions provided by the pilot teams includes> autonomous electric ferry, mobile application for the management of truck terminal, underwater drones, an inland container barges reservation system, a joint service and resource acquisition system, a mathematical model for more efficient organization of work in ports, a technical solution for dust removal when handling bulk cargoes, and a robot for measuring and analysing potential pollution.

All these solutions elaborated during hackathons have potential to become internationally attractive products, that might be applied in other Ports of Baltic See and so to contribute to more environmentally friendly, safe and innovative BSR.

Now actors of the Klaipeda region innovation ecosystem must take advantage of the achievements of the pilot projects and its events and activities. Based on the addition of the “Smart, Green and Integrated Transport Priority” that occurred in the national strategic documents Klaipeda can take initiative to boost the sector and make Klaipeda a frontrunner of smart ports.

Poland – Metropolitan Area of Gdańsk-Gdynia-Sopot

Due to COVID-19 the pilot could not take place before the time of writing this report. Description and results will be available after the pilot has been completed at https://smartup-bsr.eu/

Importance of the pilot for the region

The Gdansk-Gdynia-Sopot metropolis is the largest urban agglomeration on the Baltic Sea in Poland. There are two large seaports - one is located in Gdynia and the other in Gdańsk. The development of seaports undoubtedly contributed to the development of both cities. Maritime economy is one of the key industries in the Pomorskie region. Maritime and logistics is also one of the Pomorskie Smart Specializations.

During one of the Innovation Camps, we came to a common conclusion with Klaipeda that we could try to organize two Hackathons on the smart-port theme. One was organized in Klaipeda in September 2019. In Gdansk the Hackathon was planned for June 2020, but due to the COVID 19 situation the event was cancelled. Finally, in July 2020, the Lithuanian team proposed to organize a joint Hackathon, called Portathon Baltic 2020.

Involvement and participation

The event will be physically located in Klaipeda, but due to the COVID/19 situation, it will also be possible to access the event via an on-line platform, which significantly opens this event to participants from outside Poland or Lithuania.

From Gdansk it will be a fully on-line option for the mentors and participants. Registration for the Portathon is open to all the BSR partners. Partners of the event are two seaports (the Port of Klaipeda and the Port of Gdynia). Portathon is an event dedicated to companies, individual start-ups, specialists, engineering students and IT students. Ports, port companies and other organisations are invited to offer their challenges to the organisers which will determine the solutions invented and developed by the participants.

Pilot activities

As a metropolitan association of the Gdansk-Gdynia-Sopot metropolis we engaged the Gdansk Business Incubator as a coordinator of the Gdansk part of the event. Gdansk Business Incubator is responsible for the Pomorskie Smart Specialization in the subject of maritime and logistics, as well as cooperating for a long time in the ecosystem of start-ups and entrepreneurship development in our metropolis.

Cross-regional activities are regular. Together with the Klaipeda Technology Park (KMTP) and MITA, we meet recurrently on an on-line formula to organize the next steps bringing us closer to the event.

In such an elaborate topic as maritime transport and seaport management, introducing innovative solutions is not an easy task. By organizing an international Port Hackathon we can jointly reflect in the Baltic Sea region on the challenges which seaports are facing. Thanks to Portathon Baltic, it was possible to bring together specialists and international teams to work together on solutions for the Port of Klaipeda and Gdynia. Introductory lectures at Portathon Baltic from Klaipeda, Gdynia and Hamburg also gave the participants an impulse to work on new technological solutions.

Results

Activating business – academia cooperation is still a challenge. Certainly, in the future, it will be worth striving to build a larger environment around logistics and maritime innovation. We can see that we currently do not have a sufficient number of young innovators who would like to specialize in this topic. However, for a large port metropolis - sea ports, their development and better cooperation between cities and ports is extremely important. We believe that smart-port Hackathons are a great method for developing such a community.

Organizing the event at an international level, as well as facing the new challenge, which is to

organize a fully online Hackathon, will certainly result in acquiring new competences. Having been able to organise such a unique event and cross-regional collaboration completely on-line and virtually, this will give the team and the co-operating stakeholders the skills and competence to make use of virtual collaboration possibilities in the future.

Summary and future steps

The joint organization of the Hackathon is a port subject which is important for the entire BSR. It will be a great culmination of several years of working on the Smart-up BSR project via Innovation Camps and building the Baltic Sea Region innovation ecosystem. Most importantly, the lessons and skills learned as well as the cross-regional contacts will carry on into new future activities.

Russia - St. Petersburg Smart City

Importance of the pilot for the region

The main priorities in developing a smart city in St. Petersburg

In St. Petersburg the smart city "construction" began at the end of 2016, although some elements, such as a safe city, a single document centre, etc. were developed much earlier[34]. The project was officially launched in 2017, when the city administration entered into an agreement with ITMO University (science and citizens) to jointly create the development concept within the framework of the "smart city" paradigm. Together they have launched the Smart Saint-Petersburg Project Office inviting entrepreneurs from different areas and scales of business spheres to solve the problems of a smart city in an open discussion. The final Concept of Smart St. Petersburg was approved by the former city governor Georgy Poltavchenko in April 2017. The Smart Saint-Petersburg Draft Priority Program by Project Office based on the concept still remains at a draft stage[35].

The Smart Saint-Petersburg concept sets the main goal of "smart city" as ensuring the high perceived quality of urban life. According to the authors of the concept, the "smart city" paradigm embraces the idea of saving resources, creating high-quality urban environments and ensuring a high quality of life for the population through effective management of urban processes in combination with the open interaction of all stakeholders (citizens, business, government, and others) (Mityagin et al., 2019, pp. 18-19)[36].

The Smart Saint-Petersburg follows six key principles.

1. The principle of creating a comfortable urban environment for everyone. This principle suggests that the urban environment will provide the needs and expectations of all population groups. Defines a universal method for assessing the quality of the urban environment as the ability of a city to satisfy the objective and subjective expectations of a city dweller.
2. The principle of coordination and interaction of all participants in the development of the city. This principle suggests the need to attract all categories of stakeholders in the process of creating and using a "smart city".
3. The principle of the additional purpose of urban infrastructure. This principle implies the priority of endowing existing elements of the urban infrastructure with new functions and thereby obtaining new results.
4. The principle of sustainable development based on monitoring, analysis and forecasting. This principle involves a comprehensive digital description of the city as a holistic system and monitoring of its condition for solving the problems of assessing, analysing and forecasting the city development.
5. The principle of creating a digital environment for self-organization of residents and businesses. This principle involves the creation of a holistic information space of the city for the population and business and the opening of city data.
6. The principle of "Smart City" is a city where happy people live. This principle suggests a priority orientation on creating positive motivations of residents from interacting with the urban environment[37].

34 https://www.gov.spb.ru/press/governor/110988/

35 https://www.gov.spb.ru/press/governor/138307/

36 Mityagin, S., Karsakov, A., Bukhanovsky, A., Vasiliev, V. (2019) Smart St. Petersburg: an integrated approach to the implementation of information technologies for megalopolis management // Control Engineering Россия. 79 (1). (In Russian). Accessed at: https://controlengrussia.com/otraslevye-resheniya/zhkh/umnyj-sankt-peterburg/

37 Ibid.

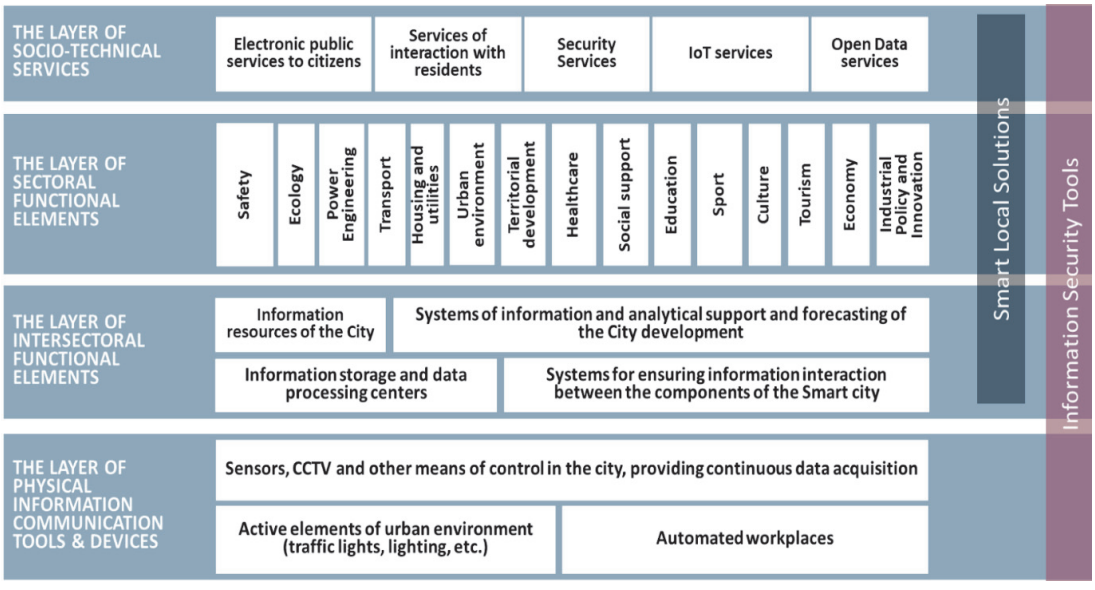

Figure 13 The structure of the interacting elements of smart city ecosystem

The notion of "smart city" in Russia at local, regional and federal levels

It should be considered that at the federal, regional and city levels in Russia there are various approaches to the definition of the concept of "smart city", and these definitions differ among representatives of government agencies and businesses.

At the federal level, the Digital Economy Standard has been adopted, where the concept of "smart city" is defined as improving the quality of city management and the standard of living in cities through the introduction of advanced digital and engineering solutions.

In 2018 the Ministry of Construction of the Russian Federation launched the departmental project on digitization of the urban household entitled "Smart City". The project is part of the national Housing and Urban Environment project and the Digital Economy national program and is financed from them[38]. The federal "Smart City" project is aimed at increasing the competitiveness of Russian cities, creating an effective urban management system, creating safe and comfortable living conditions for citizens[39]. It is based on 5 key principles:

- human orientation;
- urban infrastructure manufacturability;
- improving the quality of urban resource management;
- comfortable and safe environment;
- focus on economic efficiency, including the service component of the urban environment.

The main tool for implementing these principles is the widespread adoption of advanced digital

38 Order of the Ministry of Construction of Russian Federation Order No. 695/pr d. 2018-10-31 "On approving the passport of the departmental urbanization digitization project "Smart city". Accessed at: https://russiasmartcity.ru/uploads/attachments/c6eff680-08dc-4d26-8323-40c5629f14fb/bfe3821963d69e26c6b6276d5abb6498.pdf

39 https://russiasmartcity.ru/about.

Table 6 Russian cities IQ index

I. The largest cities:	II. The large cities:	III. The big cities:	IV.Administrative centres and pilots:
Moscow – 81,19	Khimki – 66,32 2.	Reutov – 71,35	Dubna – 72,48
Kazan' – 52, 58	Balashikha – 59,38	Serpukhov – 63,5	Ivanteevka – 62,18
St. Petersburg – 50, 37	Tyumen – 58,31	Electrostal – 61,88	Naro-Fominsk – 41,02

and engineering solutions in urban and municipal infrastructure. The Smart City goal is not only to digitally transform and automate processes, but also to comprehensively improve the efficiency of urban infrastructure.

Some elements of smart cities appeared in Russia much earlier since the mid-2000s. Therefore, the national project "Smart City" is not being created from scratch. At least four cities - Moscow[40], St. Petersburg, Kazan[41] and Tyumen[42] - began their smart city projects long before the advent of the all-Russian concept. As will be shown below, these cities rate the highest in the Cities' IQ Index.

To run the national "Smart City" project and to evaluate the situation with the present "smartness" of Russian cities the Ministry of Construction has launched a new national index - Cities' IQ. The index evaluates 10 areas of the city ecosystem (urban management, smart utilities, urban environment innovations, smart transport, intelligent systems of public and environmental safety, tourism and service, intelligent social services, economic status and investment climate, communications network infrastructure) and contains 47 indicators in total. In 2018 the index has been applied to 191 cities with a population over 100 thousand people (administrative regional centres) and pilot cities with population less than 100 thousand people which participated in the project on their own initiative. These numbers were taken as a baseline for the year of 2019 to measure effectiveness of the smart solutions implemented by Russian cities under the "Smart City" project. An important indicator of effectiveness is not the meaning of the index itself, but its dynamics through years.

The index methodology divides all of the cities into 4 groups by population: 15 largest cities over 1 million citizens, 63 large cities from 250 thousand up to 1 million citizens, 93 big cities from 100 to 150 thousand citizens and 20 moderate cities with population less than 100 thousand people. Other cities are pilot cities - administrative centres and others, 84 in total. The index for each city is calculated as a sum of ten indicators (sub-indexes). When rationing, a scale of 1 to 12 was applied[43]. The first three cities in each group are:

The position of St. Petersburg in smart city field in Russia

Thanks to vigorous activity both in the implementation of smart city projects and the development of an integrated approach for the development of the city, St. Petersburg always scores high positions in development ratings in Russia and often falls into world ratings.

In the Cities' IQ Index St. Petersburg takes the third place having lost the championship only to the Moscow capital and Kazan, where the smart city agenda is several years older[44].

Another relevant index of sustainable cities was presented by SGM Agency and scoped 185 cities with a population over 100 thousand people. The positions of cities in the ranking are based on 42 indicators measuring three main

40 https://www.smartmsk.com/aboutus

41 https://rt.rbc.ru/tatarstan/18/12/2018/5c17a40e9a794747cee87c1e

42 https://smartcity.tyuiu.ru/?page_id=2

43 The description of the "Cities' IQ" index is accessed at: https://www.minstroyrf.ru/press/minstroy-rossii-predstavil-pervyy-indeks-iq-gorodov-/

44 http://d-russia.ru/wp-content/uploads/2020/03/prezentatsiya.-indeks-iq-gorodov.pdf

areas of sustainable development: economic, environmental and social (including demographic). St. Petersburg took 2nd place among Russian cities with a population over one million people and 3rd place in the overall ranking, losing Tyumen to silver[45].

Inclusion of St. Petersburg into international ratings is occasional, while the latter usually include capitals or first leading cities of the countries (for example, New York in the USA, which is not the capital). In Russia, both of these places are occupied by Moscow, which gets into the rankings quite regularly. However, St. Petersburg appears in more complex ratings. One of these is the international rating "IESE Cities in Motion" based on public polls (though the samples are relatively small)[46]. It contains nine criteria - human capital (development, attraction and talents upbringing), social cohesion (consensus between different social groups of the population), economy, environment, management, urban planning, international relations, technology, mobility and transport (ease of movement). In total, 174 cities from 80 countries were rated in 2019 and St. Petersburg took 121st place (next to Istanbul and Doha) in the overall ranking and scored quite high in human capital (39th place) and urban planning (52nd place).

Another rating, also based on the public polls, was developed by the IMD World Competitiveness Centre in conjunction with Singapore University of Technology and Design[47]. This index measures public perception of smart technologies progress and draws on the idea that smart city technologies are crucial for attracting investments and urban development. St. Petersburg took 73rd place; citizens particularly appreciated its cultural events, job search services, and public transportation.

Involvement and Participation

According to the Smart Saint-Petersburg Concept elaborated by the Project Office and approved by the city of St. Petersburg administration, the relationship between the different stakeholders and their motivation for involvement is outlined. These are citizens of all age groups, urban communities, public authorities and business organizations and NGOs. The main interested party are the citizens, whose needs should be met in order to establish better quality of urban life.

The main stakeholders of the federal "Smart City" project besides the Ministry of Construction are the Ministry of Telecommunications, Digital Development and Mass Communications, companies-monopolists PJSC Rostelecom, governmental corporations Rosatom and Rostekh, and a newly established National Competence Centre for Smart City (NCCSC). The working group of the project is a bit wider in terms of spheres represented and includes around 30 people - representatives of companies working in IT, mobile communications, energy and natural resources consumption, representatives of bodies of executive power and a minor share - people representing science (namely two university rectors).[48] NCCSC is responsible for the development, implementation and popularization of technologies, equipment, programs aimed at increasing the digitalization of the urban economy, and also the preparation and provision of assistance to international cooperation projects on housing policy, urban development and natural resources management, primarily related to the creation and functioning of "smart cities".[49] NCCSC has elaborated the draft Smart City Standard[50] and runs a bank of "smart solutions" on the project website https://russiasmartcity.ru. Today this bank presents 537 cities, 364 projects, and 18 experts.

45 http://agencysgm.com/projects/%D0%91%D1%80%D0%BE%D1%88%D1%8E%D1%80%D0%B02017.pdf

46 https://media.iese.edu/research/pdfs/ST-0509-E.pdf

47 https://www.imd.org/smart-city-observatory/smart-city-index/

48 Order of the Ministry of Construction of Russian Federation, January 17, 2019 No. 18/pr "On the creation of a working group of the Ministry of Construction and Housing and Communal Services of the Russian Federation on the launch and implementation of the departmental project for Digitalization of Urban Economy" Smart City ". Accessed at: https://russiasmartcity.ru/uploads/attachments/60e4fc76-9ae2-4c75-aaba-258966910e77/dfd44325fe5753c979c1f1debc31085d.pdf

49 https://www.minstroyrf.ru/trades/gorodskaya-sreda/proekt-tsifrovizatsii-gorodskogo-khozyaystva-umnyy-gorod/

50 https://www.minstroyrf.ru/docs/17709/

Smart St. Petersburg Project Office

Smart Saint-Petersburg Project Office was launched as a cross-sectoral working group to run the dialogue between different stakeholders on the implementation of smart city in St. Petersburg. The first meetings started in August 2017. The Project Office was legitimized by the special order of the city governor (now former) Georgiy Poltavchenko. From the beginning Project Office (PO) has been a meeting point of different sectors - governmental bodies, business and science & education (universities). The sphere of NGO and civil society was underrepresented, however their representatives were planned to include further, after first processes and mechanisms of work were settled. One of the main features of the Project Office gathering was a key role played by the university sector, namely ITMO University (one of the leading IT and technical universities in Russia). ITMO University rector Vladimir Valiyev was appointed as a scientific curator of the Project Office, while the head of the office was the city governor himself. The PO aimed at public discussion of the concept, financial mechanisms and the priorities for smart city development in the city and for the direct cross-sectoral decisions made "at the round table". Since August 2017 the PO has been meeting twice a month, however with the re-elections of the city governor in spring of 2019 the process has stopped for a year; in spring 2020 the first gathering was planned after a long period but was stopped by coronavirus COVID-19. The continuation of the PO activity as for now is planned for August 2020.

Eventually a functional scheme of several working groups was organized inside of the Project Office:

1. workgroup on Smart St. Petersburg concept design, led by ITMO university experts in smart city;
2. workgroup on creation legal & organizational conditions, led by the Committee for informatization and communication of St. Petersburg administration;
3. workgroup on methodological support, led by ITMO university experts in technology;
4. workgroup on PR, led by Saint-Petersburg Diary media;
5. expert and technological council led by Tranzas technological business company.

The structure of the Smart City program and the mechanism of its implementation are the core of the Project Office activities.

Overcoming barriers

There are possible barriers that impede the development of "smart city" in St. Petersburg, confirmed by international studies and discussed at the meetings of the Project Office members and with other similar smart city offices of international partners in Finland and Germany.

1. Slowness of city authorities. Russia as a country and St. Petersburg as a city are conservative. This is manifested at various levels, from preserving family traditions to emerging problems in changing existing management style and habits. In a rapidly changing world such rigid structures can rarely respond quickly to challenges.
2. Hesitation of citizens. People are not always ready for change. Those projects are easily implemented, which make life easier, for example, a new tram line or a single centre for receiving documents. Citizens are very careful on any projects in the historical centre, and smart technologies do not always carefully approach the cultural heritage.
3. Peculiarities of Russian legislation. There is a rather complicated system for obtaining a primary permit for new infrastructure projects. However, after the first stage of approval, the received documents simplify coordination with various authorities.
4. Different goals among stakeholders. As studies conducted by ITMO University showed, the authorities are more interested in security systems, business is interested in profitability, and citizens are more interested in a beautiful and green city.

With the exception of the peculiarities of Russian legislation the afore mentioned obstacles are present on several occasions when cities set out to implement Smart City developments and face difficulties to agree upon the goals of the city / region's transformation.

Pilot Activities

The selection of smart projects for the future implementation under the Priority Program is a 4-stage process:

1. Technical Assessment. Automatic bots check the compliance of the application by formal parameters.
2. Expert Assessment. Applications were reviewed by independent experts approved by the Project Office. Each application was tested by a minimum of three experts, anonymous to the author of the application.
3. Design Assessment. Applications selected by experts were approved by the project office. At this stage, the number of applications at the time of the formation of the Priority Program was 91.
4. Priority Assessment. The specialized committees of the project office with representatives of the authorities selected 62 projects that should be implemented in full or in pilot format for 5 years (i.e., until 2023).

www.petersburgsmartcity.ru is the beta version of the portal developed by the Project Office for collecting the ideas. The structure of the Bank of ideas is different from the structure of the Ministry for Construction National Project. It includes functional areas which correspond to the functional division between the committees inside the city administration.

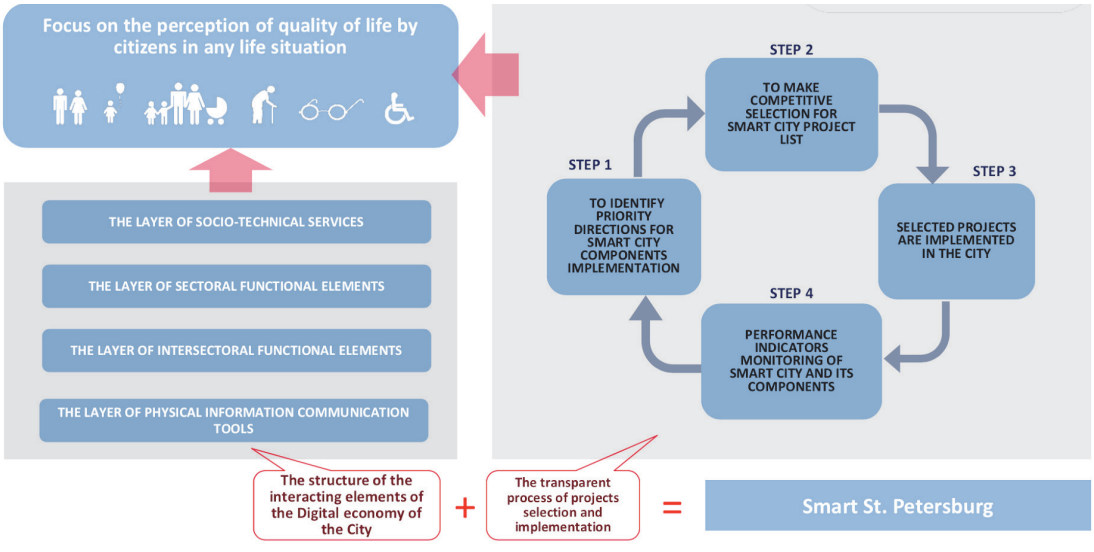

Figure 14 The layers of the "smart city" system and the process of implementation

Table 7 Project proposals for the Smart City Priority Program in St. Petersburg

URBAN ENVIRONMENT 14 projects	HOUSING AND UTILITIES 9 projects	POWER ENGINEERING 9 projects	ECOLOGY 4 projects	CITY MANAGEMENT 6 projects
HEALTHCARE 8 projects	TRANSPORT 7 projects	DWELLING 2 projects	SECURITY 5 projects	EDUCATION 1 project

In 2019, a program financing scheme for the smart projects was developed and approved, in which project financing is based primarily on grants. In 2020, the implementation of the program was suspended due to the pandemic situation, when all fixed assets and forces were transferred to fight the virus. Planned resumption of work on the project: August 2020[51].

In parallel with the development of the Priority Program, the city actively supported initiatives and pilots falling into the category of smart city and not requiring active intervention. Thus, projects were implemented to cover the city with a 5G WLAN network, new bicycle lanes, "citizen card" and pilot "smart bus stops", smart lighting and others[52].

Results

Despite the fact that Smart Saint-Petersburg is a young project, there already are successful smart projects in St. Petersburg. They concern e-participation and e-governance, smart transportation and smart lightning. Here we are illustrating some of them.

51 https://ptelectronics.ru/stati/%D1%83%D0%BC%D0%BD%D1%8B%D0%B9-%D1%81%D0%B0%D0%BD%D0%BA%D1%82-%D0%BF%D0%B5%D1%82%D0%B5%D1%80%D0%B1%D1%83%D1%80%D0%B3-%D0%BA%D0%BE%D0%BC%D0%BF%D0%BB%D0%B5%D0%BA%D1%81%D0%BD%D1%8B%D0%B9-%D0%BF/

52 http://tdaily.ru/news/2015/03/26/megafon-nastroil-lte-v-peterburge;. https://regnum.ru/news/2797610.html

"Public services" Portal

Portal "State and municipal services (functions) in St. Petersburg" (Portal) - a single access point to information and reference resources on the procedure for obtaining state and municipal services in St. Petersburg, as well as to the interactive section, which contains electronic application forms on the provision of services with the possibility of filling and submitting them online[53]. Currently, more than 150 electronic services are provided through the Portal, additional services for making payments and paying state fees in electronic form are implemented. It is also possible to track the status of the application for the provision of services submitted earlier both through the Portal and at the multi-functional centre (governmental subordinate organization providing public and administrative services in the city).

The authorized users of the Portal can access the Personal Account, where all user information is stored in a protected form. The user can fill out data about himself, his children, add information about his vehicle, so that later this information simplifies and speeds up the process of submitting electronic applications or making electronic payments. In your Personal Account you can view information on accrued fines and make payments on them.

Since the transition to the provision of public services in electronic form requires the provision of secure online identification for applicants, you can use the full range of services and services on the Portal only after registration. Registration on the Portal is based on the Unified Identification and Authentication System (ESIA). Registration in the ESIA is associated with the verification of criteria that are significant for an identity card, thus, the ESIA ensures the protection of the information contained in it in accordance with the legislation of the Russian Federation.

"Our Petersburg" Portal

The portal was created on the initiative of the Governor of St. Petersburg with the aim of increasing the effectiveness of the dialogue between citizens and authorities, as well as improving the quality of life[54]. On the portal a registered user can:

1. send messages about problems associated with housing and communal services and city improvement, the condition of roads and sidewalks, illegal objects of construction and trade, violation of land or migration laws;
2. inform city services about the lack of reference information on information stands, as well as unsatisfactory sanitary condition of the premises in budgetary institutions operating in the fields of education, health, culture, social protection of the population, and employment;
3. get additional information regarding special city programs, managing organizations, as well as background information on objects of interest;
4. get acquainted with the technical and economic passports of apartment buildings in St. Petersburg and get information about the organizations serving them;
5. receive information on the progress of consideration and development of messages sent by user;
6. evaluate the response received.

Messages sent through "Our Petersburg" portal are mandatory for city services to consider in a strictly defined time frame. The portal is constantly being improved and expanded.

53 https://www.gov.spb.ru/gosuslugi/

54 https://gorod.gov.spb.ru/about/

Commercial tram "Chizhik"

St. Petersburg has long been considered the world capital of trams; the largest number of tram tracks were laid here[55]. However, in recent years there has been a tendency to reduce tram tracks and transfer lanes for conventional vehicles. At the same time, passenger flows are redistributed between buses, trolleybuses and the subway. One of the most successful projects in the field of transport now looks all the more curious: several years ago, the first commercial route "Chizhik" was launched. Unlike other modes of transport, which are serviced by enterprises with large shares of the city or state capital, this project is absolutely commercial.

Modern, high-tech rolling stocks of the Swiss company Stadler make a 3-section single space of the tram and ensure even distribution of passengers. The salon is quite spacious, with capacity up to 370 passengers. The structure is two-sided - with two control cabins and symmetrically located doors on both sides. The wagons have a completely lowered floor, which ensures ease of boarding and exit, as well as the availability of this type of transport for people with limited mobility. The salons are equipped with modern air conditioning and heating systems. Strollers are available. Inside each car there are information boards and speakers that inform about the route and the next stops.

New tram tracks have been created using modern technologies for noise insulation and vibration reduction of the rail track. Tram tracks go along a selected section of the road. A special dispatching system assumes a calling phase, providing a "green" corridor, thereby providing a priority for the tram when crossing intersections. These "smart" trams, moving on a separate canvas with a high average speed, are an effective form of urban public transport and are second only to the underground in terms of carrying capacity.

The tram payment system is fully integrated with the citywide system. In "Chizhik" all kinds of documents giving the right for privileged travel are accepted. The fare is based on urban public transport tariffs. Finally introduced in the 3rd quarter of 2019, Chizhik operates in one district of the city and has plans for two more.

Future Steps

Smart Saint-Petersburg Project future is connected with two key domains: development of the Concept and the Priority Program.

As the city moves one and introduces new smart technologies, the concept should be reviewed and adjusted. In addition, its new versions should take into account new challenges of the time that could not be provided for in previous versions. An appropriate example is the coronavirus COVID-19 outbreak. Smart health was represented in the concept from the very beginning; however, this block requires adjustment based on the consequences of the new challenge.

The Priority program can also be adjusted for the same reasons; however, it should not undergo drastic changes. Among the medium-term projects to be implemented in St. Petersburg in the next 2-3 years, the following can be noted:

55 http://chizhik-lrt.ru/

- Creating an ecosystem of services for a city dweller. The project is implemented jointly by the Committee on Informatization and Communications and ITMO University. It is planned to streamline existing and develop new services for the city dweller associated with all the basic blocks of life. The presentation was supposed to take place in April 2020 but was postponed for known reasons.
- Systems of automated control of public safety. First of all, transport, courtyards and residential complexes. The system itself has already been implemented in almost the entire city; systems identify a person by her digital footprint (cameras, mobile data, payment data from bank cards, etc.) in automatic mode.
- Unified integration platform for housing and communal services. Data from numerous sensors, including those installed in apartments and highways, should more efficiently allocate resources and respond quickly to emergency situations.
- Smart library. Implementation of a project for access to electronic library collections with a single-entry point.
- Unified electronic medical record (the project is integrated with a similar all-Russian project).
- Monitoring system for cancer patients, the elderly and people requiring an inclusive approach.
- Unified urban data platform. Most of the city data, except for those of strategic importance, is planned for opening for use by citizens and business.

The main long-term project at the moment is the City's Digital Twin - development of a situational analysis system based on automatically collected data. A large number of a wide variety of sensors have already been installed in the city, and the system of processing information from them and automatically making decisions is improved annually. It is assumed that in the future, all analysis systems will have to merge into one and make decisions not only on the basis of their own sensors, but also information from other analysis systems.

ANNEX II
EU SUSTAINABILITY COMMITMENTS

To reach the EU Green Deal goals reginal action needs to be directed at multi-governance level, through e.g.

- investments in environmentally friendly technologies
- support for industries to innovate
- private and public transport that is cleaner and cheaper
- solutions to decarbonise the energy sector
- energy efficient buildings
- improved global environmental standards by working with international partners.

Europe and its members states, citizens and industry are on the way towards an environmentally friendly economy and sustainable urban and rural life. Between December 2019, when the Green Deal was launched, and August 2020 several strategies have been drafted to feed the policy areas which will enable the changes required and on which regions can base their sustainable economic transformation strategies. The work done during 2020 includes:

- A Commission Communication on the Sustainable Europe Investment Plan
- A Proposal for a regulation establishing the Just Transition Fund
- A Proposal for a European Climate Law
- A new Industrial Strategy for a green and digital Europe
- A Proposal for A European Year of Rail (2021)
- A new Circular Economy Action Plan for a Cleaner and More Competitive Europe
- A Presentation of the EU Biodiversity Strategy for 2030
- The Adoption of the EU strategies for energy system integration and hydrogen

The policy areas that are affected by the Green Deal cover:

- measures to protect our fragile ecosystem (biodiversity);
- ways to ensure more sustainable food systems (from farm to fork);
- ways to ensure sustainability in rural areas thanks to CAP, the Common Agricultural Policy (sustainable agriculture);
- ways to innovate for cleaner energy (clean energy);
- ways to ensure more sustainable and environmentally respectful production cycles (sustainable industry);
- measures to mobilise a cleaner construction sector (sustainable building and renovating);
- ways of promoting more sustainable means of transport (sustainable mobility);
- measures to cut pollution rapidly and efficiently (eliminating pollution); and
- measures for making the EU climate neutral by 2050 (climate action).

The European Digital Strategy

The European digital strategy directs action to three areas: 1) it strives towards excellence and trust in Artificial Intelligence (AI) with the aim to empower businesses to start, scale up, innovate and compete on fair terms; 2) it ensures that the European Data Strategy promotes social and environmental sustainability, for example by making emission-heavy processes more efficient through digital technologies; 3) it ensures with its new Industrial Strategy that European businesses can transform yet remain fit to achieve their ambitions and cope with global competition

The European approach to a digital future is based on three main pillars which have the

role to ensure opportunities for citizens and businesses and governments in a multi-level digital transformation. The three pillars are of crucial importance for local and regional implementation as they ensure that the EU's digital strategy will foster technology innovation that works for the people, that businesses operate in a fair and competitive digital economy, and that a democratic and sustainable society includes citizens with better control and protection of their data, with the opportunity to develop a health data space to foster targeted research, diagnosis and treatment, and the ability to fight disinformation online and foster diverse and reliable media content.

Source: https://ec.europa.eu/info/strategy/priorities-2019-2024_en

ANNEX III
INNOVATION CAMPS SMART-UP BSR PARTICIPANTS' LEARNINGS

WHAT

Figure 15 What is required to enable local action?

- We didn't have a challenge case of our own in the innovation camps, but I learned a lot about the cases of other regions. It also showed that we have similar practical challenges in the BSR regions.
- The camps provided a possibility to discuss with peers in general. In the challenges we could get deeper into details and discuss the real-life practices, processes, and possibilities within the subject area of the case. Sometimes it is about the learnings and how they can be put into practice right away, sometimes it is was more about building capacities for the future.
- The Innovation Camp is a great tool for exploring and finding new ways to solve challenges. The Innovation Camp brings together business, science and societal actors with different backgrounds, competences and experiences. Each representative has the opportunity to present their idea regarding the challenge to be solved. Innovation camps needs experts who can put together teams and who can evaluate the new ideas that are provided. The insights of the experts are important to reach an effective outcome of the innovation camp and channel the ideas into the right direction for the region.

- Our pilot considers the following actions important:
  - Clearly identify challenges that are relevant to the region / all regions (if the camp is cross-regional);
  - Gather the widest possible audience involving representatives from science, business and government;
  - Mobilize experts of the highest possible qualification.

- A group, of as diverse as possible, have to find innovative ideas. There is lots of strength in collective knowledge, especially if you work in an international environment.

- For me personally the best phrase to answer the "what" question was the one which said that camps are entrepreneurial discovery processes.

- It has been interesting to see that the challenges of the different regions are very similar too each other. Different pollical focus seems to have steered each region towards different solutions to the same challenges.

- The exchange of local culture during the camps was interesting. This primarily happens within the "gaps" of the Innovation Camps e.g. during social activities, dinners or travel time.

- The most significant from my perspective in Innovation Camps is exchanging of expertise and practices which leads to look out of the box. I think the collective knowledge reflects my thoughts more fully.

- Innovation Camps address and tackle both local and global societal challenges.
  - Innovation Camps enhance regional, inter-regional and international collaboration.
  - Innovation Camps strengthen and boost innovation capacity.

- To put it simply - a very heterogenic group of people of all backgrounds, ages, sexes, colors, educations, walks of life and nationalities get together to have a blast on innovation! The end results tend to be very interesting, thought provoking and unexpected thanks to the use of Design Thinking methods.

WHY

Figure 16 Why do stakeholders act and push action forward?

In general cross-regional innovation camps are a good way to get to know with colleagues from different regions and discuss multiple possibilities to work towards solutions and different ways to reach results.

Concerning the challenges which are tackled in the innovation camp it is relevant to get together a group of people with wide experience and give them the space to concentrate on finding the solutions for your challenge. A project like Smart-up brings together the kind of expertise you might not have reached otherwise.

When having the innovation camp in your region there is the possibility for all participants and experts to experience the real environment and therefore become aware of different aspects relevant to the case and the challenge to be solved. To get the best out of this opportunity local challenge owners need to be present. (KHP)

Every country in the Baltic Sea Region has challenges related to Smart Specialization and its implementation. The Innovation Camp is an event that provides concrete answers to the posed challenges. Our experience shows that even a mini-innovation camp as it organized in Lithuania can bring results, and the results were excellent. We, the authors of the challenge, got ideas on how to effectively use innovative tools to solve the challenge. Together with the participants of the innovation camp, we managed to put together an action plan to solve the challenge.

Our experience clarifies why innovation camps should take place; the results observed were:

- A positive influence on the process of solving the local challenge;
- An action plan to the concrete challenge easily reached;
- An insightful sharing of practical experience between regions.

One of the most important WHY aspects that I discovered was related to creating a network. Not only network of participants of the camp (which is very important), but also a network of ideas, ways of doing, challenges. Knowing that other partners in BSR have similar (or then again quite different) experiences regarding the 3S, helps putting one's own experience in perspective.

Innovation Camp is held to develop new solutions, it is also a great method to involve new people, e.g. from other industries. When the group is diverse, the value of new solutions increases. The international formula of the Innovation Camp is also a great opportunity to learn from each other, use the already developed practices, as well as inspire and give each other the driving force to introduce new products or changes.

- To network and bring in new perspectives on shared challenges.
- We do not see challenge obstacles being eliminated during the camps, however they were reflected upon.
- The camp also seemed to work well as a format to bring in international discussions to the local level.
- International awareness about local challenges (but also opportunities, from the tours around the region).

I think that Innovation Camps give possibility to find innovative solutions for local problems taking into account the regional context and to come to the decision towards a challenge by concrete steps.

Innovation Camps are held
- when all relevant key stakeholders are committed to participate and contribute
- when challenges/ problems need to be solved are complex
- when you need fresh ways of thinking and doing things (novel ideas and new insights).

Because it's just not possible to come up with anything truly great in a vacuum by oneself - but through interaction and proaction - and action!

WHO

Figure 17 Who do the actions serve, who has the competence to act?

- It is good to have a wide range of participants in each innovation camp, all of them provide a relevant contribution. Having participants from different organisations and backgrounds gives a wider perspective to understand the cases and a broader range of innovative solutions can be considered.

- From the participants point of view, it is good to know the program, process, and timetables beforehand. It is also good to bear in mind that there will be both extroverts and introverts participating. To get most out of the diverse group of people this is taken into consideration when planning the methods used. (KHP)

- In order to achieve the most effective result and not only meet expectations but achieve the optimal solution for the challenges it is very important that the people gathered will not act as an audience, but they will actually participate in the innovation camp. The organizer of the Innovation Camp should understand that the aim is not the largest possible number of participants, but the participants should be representatives of different fields with different experience and competencies. Our experience showed that the innovation camp achieved the great success due to two factors: first, the specialists chosen according to the expertise in their fields and second, the moderator who was able to facilitate looking at the challenge from different angles, to mediate when finding the best solutions, and to guide the process of putting them together into an action plan.

- By participating in other innovation camps, we have seen that solutions of challenges are seen differently not only by representatives of different competences and fields, but also by participants of different age groups. Today, the involvement of young people in such events is very important, as the new generation contributes with different views to the decisions/solutions.

- It is not only diversity in a socio-economic aspect, but it is diversity in terms of background experience and approach. On the other hand, people who have been in camps several times, seem to be quite aligned – they know what to expect from a camp and what is expected from them and act accordingly. Perhaps it is inevitable that the freshness of diversity goes away if the same kind of people get used to each other.

- When inviting participants of the Innovation Camp, it is worth considering who will be involved at which stage of implementation of the developed idea, and who has an impact on the planned change. It is also valuable to invite different groups of beneficiaries, e.g. when we want to check immediately whether the solution will be suitable for them or not.

- It gives a different dynamic to innovation processes when there are all levels of stakeholder represented. Some of the lessons learned might be that the more senior or VIP profiles tend to leave the camp after the first half / day, which often leaves students or other partners. It was good to have a global thought leader present to bring up challenges to a more global level and also to present international opportunities to continue the work with overcoming them.

  The young age group (from the Youth network) was inspiring to have onboard and experience their motivation to change the world for the better. It gave good energy to the rest of the participants.

  It is important to have facilitators onboard that know how to manage the groups and the internal power structures. Otherwise the experience was the more senior or alpha would steer the discussions.

  There is a need to have more end-users on board of the camps, so we could have asked them more about the challenges. Often it was a representative from the city or region that presented the challenges experienced by the companies or citizens in the region.

- I consider that to engage representatives based on Quadro Helix principle brings advantages to look at a challenge from different angles. Combining experience of various experts, decision-makers and citizens allows to look at a challenge completely and avoid distortions.

- It is important that participants are diverse in many ways -it improves chances to create really new ideas, relationships, and collaboration. It is also crucial that IC facilitators are professional and experienced in their job. If not, concrete results and benefits might be hard to reach.

- This picture sums it up really well! I'd also add experienced people and enthusiasm to it as well.

HOW

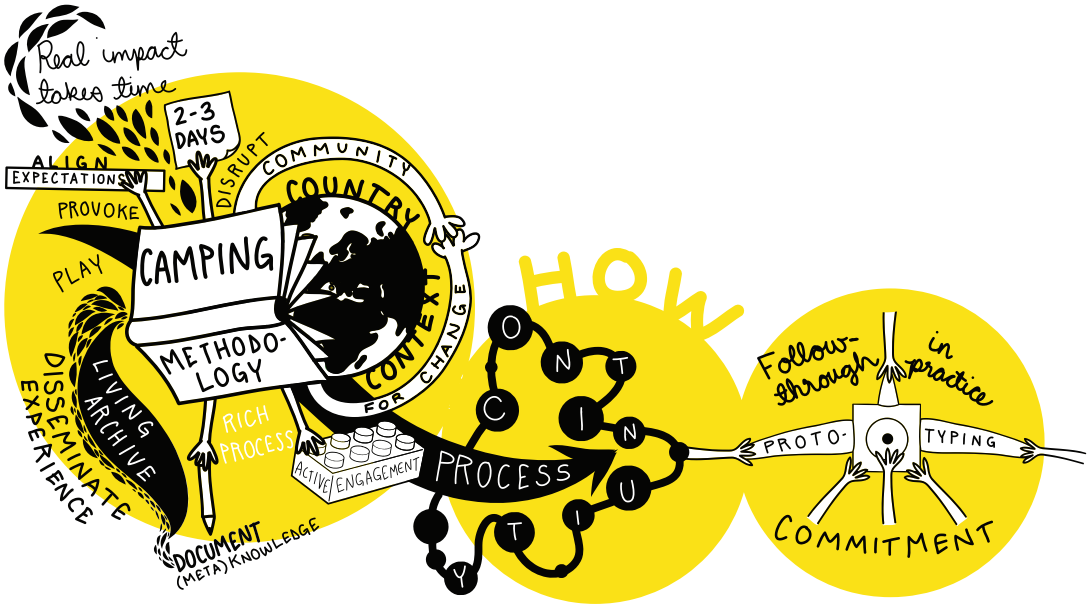

Figure 18 How do instruments lead to results?

- In the original idea of innovation camps the challenges were tackled by a self-organising group of experts. In my experience it is more useful to have a facilitator and someone with deep knowledge of the case in the group. This helps reaching results easier to use for the case owner, yet the results can still be quite out-of-the-box.

- "I liked the way we used different methods of facilitating in different camps. It gave the possibility to learn and use new methods in practice. These skills are useful in the future as well".

- The most important aspects of the innovation camp are the participants, internationality, challenges, experts, the result achieved. To achieve this, it is necessary to combine all available human and financial resources, as well as to invite to join the partners and all our networks.

- Disseminate information about the event as early as possible and the program of the event should be laid out for a period of 2-3 days. The best result is achieved when the holder of the challenge makes a presentation at the innovation camp or organizes a visit for the participants, where challenge owners can visually present the relevance of the challenge. It is important to explain to innovation camp participants what is the purpose for which they are gathered, and what the organizers and challenge owners expect from them.

- When inviting the moderator/main expert to the event, the organizers must explain what is expected from the innovation camp moderation: the moderator has to provoke teams by asking triggering questions, and by applying various methodologies of analysis in the brainstorming.

- Our experience shows that intermediate presentations of team results to other teams and experts are significant and give a vital boost. During these interim presentations, the teams receive insights on other solutions by other participants that give a significant towards a feasible solution.

- It is important to emphasize that there are no bad ideas or thoughts – what is important is to discuss, analyse and create an action plan that is acceptable to everyone.

- Good to have the elements of the methodology (length of camp, active engagement, disrupt, play, provoke etc.). Prototyping I understand is one of the most prominent outputs of the camp, it should not be marginal but central, surrounded by some other concept. This has been my experience in camps.

- The formula of working on solutions, preceded by an inspirational visit related to a specific challenge, proved to be very successful. It is extremely important that each participant has a good understanding of what the challenge is about and understand it by seeing a specific place. The role of the challenge-owner is also important to present the challenge well, and also inspire and motivate participants to continue working on it.

- Challenges should be followed up on. There should be continuation between the camps, so same ideas are further developed.

  It is good to have the groups close to each other in break out rooms or in a big enough room, where they do not interfere with each others' focus, but keeps their presence close so you can follow the other groups progress and share informal knowledge in the coffee breaks.

  Short camps provided less value than the 3-4 day programs. Especially when there was left room for doing activities outside the group work e.g. see historical sites or visit local companies.

  It was interesting to see new methods being applied for the camps in each region. This gave us some new tools that we have incorporated into our existing "tool kit".

- The winning aspects is that the Innovation Camp methodology was complemented each time by creative tools. This allowed to "wake up" the participants and invent new solutions for the proposed challenges.

- • When you are committed to work and contribute during Innovation Camps it is really hard work.
  • Well defined and formulated challenges are essential for Innovation Camp work.
  • Facilitators must be professional and experienced in their job to reach concrete results.

- Don't rush! Use more time, and enjoy before letting the process move to the next stage. Every stage is an exciting journey - and when journeying the road is the purpose. Don't think about getting there, or you never will!

ANNEX IV – OVERVIEW OF REGIONS

	Brandenburg/Berlin	Helsinki-Uusimaa	Midtjylland	Pomorskie	Kymenlaakso	Estonia	Latvia	Lithuania
Country	Germany	Finland	Denmark	Poland	Finland	Estonia	Latvia	Lithuania
NUTS-level	NUTS-2	NUTS-2	NUTS-2	NUTS-2	NUTS-3	NUTS-0	NUTS-0	NUTS-0
Population (thousands)(2019)	2,500 Brandenburg 6,000 incl. Berlin	1,689	1,314	2,338	176	1,319	1,934	2,809
GDP per Capita (PPS) in % of EU average (2018)	88 (Brandenburg) 122 (Berlin)	141	117	69	98*	79	67	79
% of national GDP	2% (Brandenburg)	38.7 %	20.6 %	5,9 %	18.9%*	-	-	-
% R&D spending of GDP	4% (Berlin)	3.48%	2.46%	1.08 % (2017)	1.73%*	1.28%	0.64%	0.94%
Innovation Score-board Ranking	Strong Innovator	Leader Innovator	Leader Innovator	Moderate Innovator	Leader Innovator*	Strong Innovator	Moderate Innovator	Moderate Innovator
Smart Specialisa-tion type	Regional	Regional	National/ decentralised	Regional	Regional	National	National	National
Industrial sector structure in Smart Specialisation	Steel, agriculture, renewable energies Research	Research, Smart City, clean technologies, logistics, health and manufacturing	Research/Smart City	Off-shore, port and logistics/ IT/ Eco-effective/ Medical	Port/Logistics/Forest	High tech	Research/Port/ Bioeconomy	Port/Maritime
Nr of enterprises and % of country	98 293 – 2,8%	94 621 - 33%	38 554	307 300	62 423	90 736 Estonia (2019) 64 699 Tallinn (2018)	185 006	87.143 (2020)
Average size of firms (2018)	99.7% SMEs	99.7% SMEs (incl..92,6% micro) 0.3% >250 empl.	99.6% SMEs (incl. 85.8% micro) 0.4% >250 empl.	99.93% SMEs (incl. 96.68% micro) 0.07% >250 empl.	77% family owned	Estonia (Tallinn) 94.85% (99.9%) SMEs incl. 93.92% (95.6%) micro 0.137% (0.1%) >250 emp.	99% SMEs (incl. 93% micro) 1% >250 empl.	100 employees avg. 99.5% SMEs (incl. 82.4% micro) 0.5% >250 empl.
Sources	https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/Brandenburg https://www.wfbb.de	https://www.uudenmaanliitto.fi/tietopalvelut/uusimaa-tietopankki/yritykset https://issuu.com/uudenmaanliitto/docs/helsinki-uusimaa_region_in_figures__30cc2b377c71d0	https://www.rm.dk/om-os/english/regional-development/Education-and-competence-development/Development Strategy 2019-2030 https://www.rm.dk/om-os/english/regional-development/Education-and-competence-development/ https://erhvervsfremmebestyrelsen.dk/sites/default/files/2020-03/Erhvervsfremme-i-Danmark-2020-2023_Strategi.pdf https://www.statistikbanken.dk/10100	https://pomocdlafirm.pomorskie.eu/documents/2860347/2870562/starter_EN_v13_podglad_linki.pdf/0470054f-5a9d-4b17-bd1d-7ba056db7384	* NUTS-2 figures of FI1C Etelä-Suomi (Southern Finland) which includes 5 NUTS3 sub-regions. https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/south-finland **https://issuu.com/uudenmaanliitto/docs/helsinki-uusimaa_region_in_figures__30cc2b377c71d0 http://www.europeanfamilybusinesses.eu/uploads/Modules/Publications/finland-fambus.pdf	Estonian Labour Market – OSKA- https://oska.kutsekoda.ee/en/future-labour-market-trends/estonian-labour-market-today-tomorrow/ oska.kutsekoda.ee http://pub.stat.ee/px-web.2001/I_Databas/Economy/09Financial_statistics_of_enterprises/ 06Enterprises_income/02Annual_statistics/02Annual_statistics.asp	http://data1.csb.gov.lv/pxweb/ lv/uzn/uzn__01_skaits/SRG030.px/	https://ec.europa.eu/eures/main.jsp?catId=2777&countryId=LT&acro=lmi&lang=en&regionId=LT0&nuts2Code =%20&nuts3Code=&regionName=National%20Level https://strata.gov.lt/en/human-capital-policy/results https://www.oecd.org/cfe/smes/LITHUANIA-IE-Country-Note 2018.pdf https://www.oecd.org/cfe/smes/LITHUANIA-IE-Country-Note-2018.pdf

	Brandenburg/Berlin	Helsinki-Uusimaa	Midtjylland	Pomorskie	Kymenlaakso	Estonia	Latvia	Lithuania
Regional needs	• Need for cooperation in five clusters with Berlin: energy technology, healthcare industry, ICT/media and creative industries, transports and logistics and photonics. • Need of development in four clusters exclusive to Brandenburg: food industry, plastics and chemistry, metal, as well as tourism • Need to implement a broader innovation concept, a deeper cross-cluster collaboration, open innovation, sustainability, and stronger regional emphasis on internationalisation.	• Need for wider cooperation and better coordination between actors • Need for inter-disciplinary cooperation • Need for orchestration of ecosystems and platforms for regional integration of competences and to enhance the use of competences • Need for top talent in major themes, e.g. climate neutrality	• Engage in more partnerships to find new solutions to emerging challenges • Relevant competencies for citizens science • Access to education • Infrastructure, mobility • Innovation at hospitals, social institutions • Green transition and sustainability in regional activities • Skilled labour • Entrepreneurial and innovation environments • Business potential in green transition and circular economy • Digitization, automation • Export potential of SMEs.	• Implementation of activities/development of tools to strengthen pro-innovative activity of enterprises, including research • Creating conditions for effective cooperation of enterprises with research and development units and enabling a smooth transfer of knowledge to the economy • Support for Pomorskie Smart Specialization areas, as well as the creation and development of innovative clusters.	• Need for Innovations in Smart logistics, safety, and digitalisation applied to forestry, biofuels and bioenergy, transport, and logistics.	• Need for coordination capacity between different departments in Tallinn City to better implement Tallinn 2035 Development Strategy. To accomplish these goals, a new strategy center is established in Tallinn. • Coordination capacity need at national level. Separated strategies for entrepreneurship and RDI have been brought under one strategy, coordinating between the Ministry of Economic Affairs and Communications and the Ministry of Education and Research. • Cooperation between municipalities to better implement these strategies. • Need for coordination capacity to lead large-scale projects, and develop unified standards for service delivery etc.	Developing strategic value chain ecosystems, research excellence, and technology transfer.	Need for additional human capital of over 100.000 persons.
Competence requirements	• Competence for transfer of expert knowledge to research and development, and entrepreneurship. • Competence in administrative support for research projects, specialised lead projects in latest technology trends and research findings • Coordination of joint projects research-enterprise-citizens.	• Substance competences in different fields of research and technology, • Competences in linking, connecting, coordinating and orchestrating.	• Knowledge and competencies within natural science, digitisation, technology, integrated creative skills. • Competences to fulfil regional technology pact towards acquiring skilled workers with STEM competencies*	• Flexible approach towards constantly changing needs • Openness to change • Ability to work in interdisciplinary, and age and culturally diverse teams • Adaptability - easy retraining, adapting to needs and situations	• Need for competence in digitalisation and industry applications • Need for competence in cross-cutting themes • Need for expertise in cyber-security services	• Need for substance competences for the above strategies • Specialists in ICT, forestry, healthcare, energetics and mining, construction, real estate • Specialists in different industries such as chemistry, machinery • Specialists in education • Smart workers with know-how in new developments and implementation.	Skilled human resources, technology transfer support, specialization in thematic niches (sub-RIS3 level)	• Skilled labour • Fill the gap in adult working population with higher education • Need for substance workers with working experience and with capabilities such as: responsibility, proactiveness, sociability, diligence, creativity, commitment to results, independence, honesty, communication, teamwork, negotiation, computer skills.

	Brandenburg/Berlin	Helsinki-Uusimaa	Midtjylland	Pomorskie	Kymenlaakso	Estonia	Latvia	Lithuania
SMART SPECIALIZATION THEMES LISTED IN RIM+ or COULD BE REPLACED WITH OWN INFORMATION	• Life sciences and healthcare • Energy technology • Mobility (including transport and logistics) • ICT, media and creative industries • Photonics (including microsystems technology). Based on joint Berlin/ Brandenburg strategy InnoBB	Urban Cleantech; Digitalising Industry; Health and wellness; Citizen City	Smart Industry, Creative ICT & Tourism, Growth drivers, Energy & Climate, Foodstuffs.	• Offshore, port-logistics technologies. (PSS1) • Interactive technologies in an information-saturated environment. (PSS2) • Eco-effective technologies for generation, transmission, distribution and consumption of energy and fuels, and in construction. (PSS3) • Medical technologies in the area of civilization and aging-associated diseases. (PSS4)	Invest in activities with a view to Russia, Clean energy and ecological building, Smart, environmentally friendly packaging		• Knowledge intensive bioeconomy, • Biomedicine, medical technologies and biotechnology, • Smart materials, technology and engineering, • Advanced ICT • Smart Energy	• Agricultural innovations Food technologies, Energy and Sustainable environment, • New production processes, materials and technologies, • Health technologies and biotechnologies, • Transport, logistics and ICT • Inclusive and creative society

Maroš Šefčovič
Vice President, European Commission
Interinstitutional Relations and Foresight

'Strategic foresight is about anticipating, exploring and acting. And the third part – acting – is what makes foresight strategic.'

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