



An Overview of Smart Specialization Strategy in Lithuania



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INTRODUCTION

The Smart Specialization approach for the Research and Innovation (R&I) policy in EU already has effects on stakeholder engagement, decision-making processes, monitoring and evaluation mechanisms and many more. The impact is present in R&I systems EU wide and they are almost ready for the next generation of Smart Specialization Strategies (thereafter -S3). However, there is little evidence about the impact of S3 for the transformation of the economy for a particular region. Even more important, projected impact assessment and evaluation mechanisms - the tool at stake to understand the gathered evidence - tend to be used in ex-post scenario, rather than at an interim stage, when there is still a chance for adjustment of the strategy.

Lithuania has allocated around €800 million (with ESIF) to its Smart Specialization Strategy during the life-span of 2014-2020 programming period. Main implementing ministries, the Ministry of Economy and Innovation and the Ministry of Education, Science and Sport – have initiated 22 measures, targeting businesses, researchers, research institutions, as well as business – research collaboration projects. The design of S3 was based on 6 broad priority areas, which translated into 20 specific priorities, going down to the level of technologies.

At the end of 2018 year an Interim Evaluation of the S3 Program Progress was carried out. After analyzing the evaluation results and after assessing the potential and future perspectives of the individual priorities, there were presented detailed conclusions, recommendations and possible scenarios for further investments in the relevant areas and the formulation of new thematic directions. Taking into consideration the monitoring data of S3 implementation, it was decided to abandon the logic of two-level hierarchy S3 priorities and stay with the broader and more inclusive single level. Out of 6 priority areas and 20 priorities, 7 priorities were reformulated with the involvement of EDP stakeholders. It was also decided to renew the list of corresponding technologies (as the previous one was from 2012) in the new priorities, although their titles/designations remain almost the same.

Smart Specialization is a strategic programme of state support for R&D&I (the Programme was approved on the 30th of April 2014 by the Resolution of the Government of the Republic of Lithuania No 411 (further – Initial S3) in which Lithuania, like other European Union countries, has set its R&D&I priorities, considering existing or potential competitive advantage. Priority directions for R&D&I were determined by analyzing the potential of business and research in Lithuania, including the human capital.

On the basis of the interim evaluation there was prepared 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, that was approved on the 24th of July, 2019 by the Resolution of the Government of the Republic of Lithuania No 760 (further – current S3).

This document is aimed to present an overview of the Smart Specialization Strategy in Lithuania, the way it was developed and updated, describe the innovation – based ecosystem, S3 monitoring and implementation mechanisms, regional tools for involvement of quadruple helix stakeholders as well as to present regional perspective to national S3: Kaipeda case.

This overview of Smart Specialization in Lithuania has been prepared in the frame of the Interreg BSR supported project Smart – up BSR: improving smart specialization implementation of the Baltic Sea region through orchestrating innovation hubs.

INITIAL S3 STRUCTURE

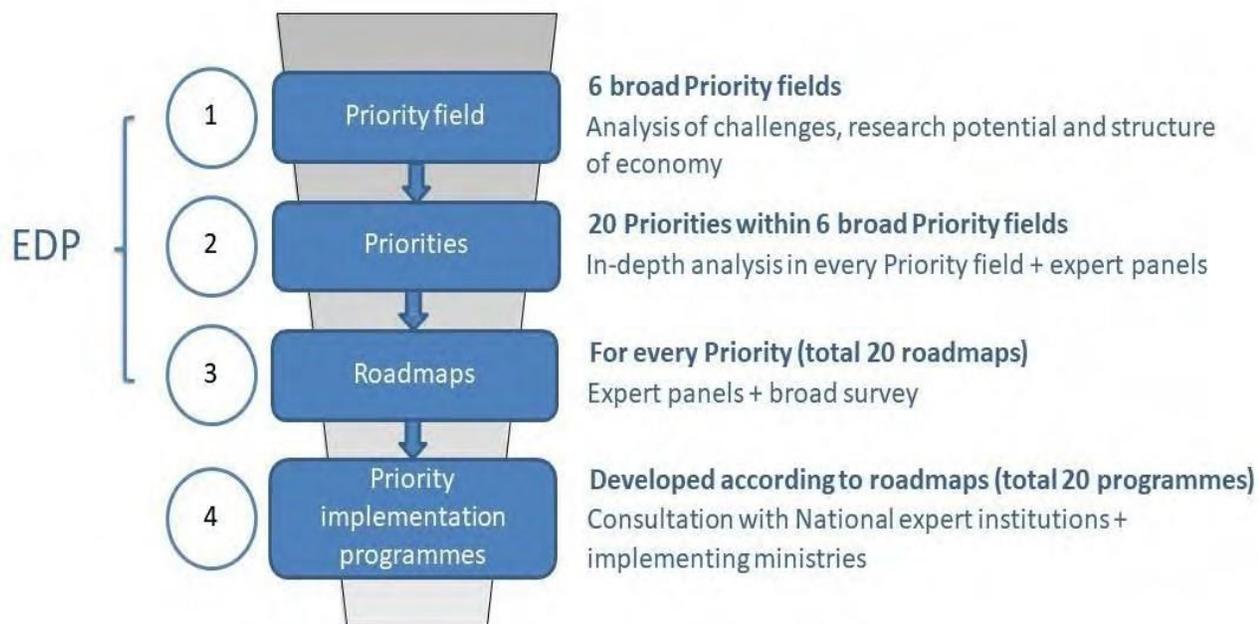
Smart Specialization addresses structural changes in the country's economy - high added value, knowledge and highly skilled, labour-intensive economic activities should account for a larger share of GDP.

The main document, related to S3 in Lithuania is the Programme on the Implementation of the Priority Areas of Research and (Socio-Cultural) Development and Innovation (Smart Specialization) and their Priorities, that was approved on the 30th of April 2014 by the Resolution of the Government of the Republic of Lithuania No 411 (further in this document – the Programme). The strategic goal of the Programme is to increase the impact of high value added, knowledge- intensive and highly-qualified-labour-intensive economic activities on the GDP and structural changes of the economy by means of the R&D&I decisions. It also identifies the specific R&D&I priorities of the research and (socio-cultural) development and innovation (Smart Specialization) priority areas and formulates the provisions for the implementation thereof.

The process of preparation of the Programme has been framed by applying various different methods, such as analyzes, fore- sight, surveys, and panel discussions. Entrepreneurial discovery process (EDP) was also applied to foster the collective ownership and involve the stakeholders.

The process has started with analysis of the global and domestic challenges, and national scientific and entrepreneurial potential. The investigation of the scientific excellence resulted in determining six top-notch scientific fields. Meanwhile, a review of Lithuanian economy strengths and prospects for knowledge-driven growth were investigated. The final priority fields for national innovation priorities were also mapped (Table 2, Source: STRATA).

Table 2. Initial S3 development scheme.



Source STRATA

INITIAL S3 PRIORITIES

The Initial S3 Priorities concentrated on two level priorities fields, that were defined through smaller priorities, each of them having separated roadmaps and implementation programmes.

The initial S3 priority fields focused on:

1. Energy and sustainable environment, with identified more detailed priorities:

- Smart energy systems (smart systems for energy efficiency, diagnostic, monitoring, metering and management of generators, grids and customers);
- Energy from biomass and waste (energy and fuel production using biomass / waste and waste treatment, storage and disposal);
- Digital construction (technology for the development and use of smart low-energy buildings);
- Solar energy (solar energy equipment and technologies for its use for the production of electricity, heat and cooling).

2. Health technologies and biotechnology, with identified more detailed priorities:

- Molecular technologies (molecular technologies for medicine and biopharmaceutics);
- Advanced technologies for health (advanced applied technologies for individual and public health);
- Advanced medical engineering (advanced medical engineering for early diagnostics and treatment).

3. Agro-Innovation and food technologies, with identified more detailed priorities:

- Safer food (sustainable agro-biological resources and safer food);
- Functional food (functional food);
- Biorefinery (innovative development, improvement and processing of biological raw materials).

4. Novel production processes, materials and technologies, with identified more detailed priorities:

- Photonic and laser technologies (photonic and laser technologies);
- Functional materials and coatings (functional materials and coatings);
- Structural and composite materials (structural and composite materials);
- Flexible production systems (flexible technological systems for product D&P).

5. Transport, logistics and information and communication technologies, with identified more detailed priorities:

- Smart transport and ICT systems (smart transport systems and ICT);
- International transport corridors (technologies / models for the management of international transport corridors and integration of modes of transport);
- Digital content (advanced digital content development technologies and information interoperability);
- Cloud computing and services (ICT infrastructure, cloud computing solutions and services).

6. Inclusive and creative society, with identified more detailed priorities:

- Educational technologies (modern self-development technologies and processes which encourage creative and productive personality building);
- Implementation of breakthrough innovations (technologies and processes for the development and implementation of breakthrough innovations).

EU FUNDING POLICY MIX IN LITHUANIA FOR 2014-2020

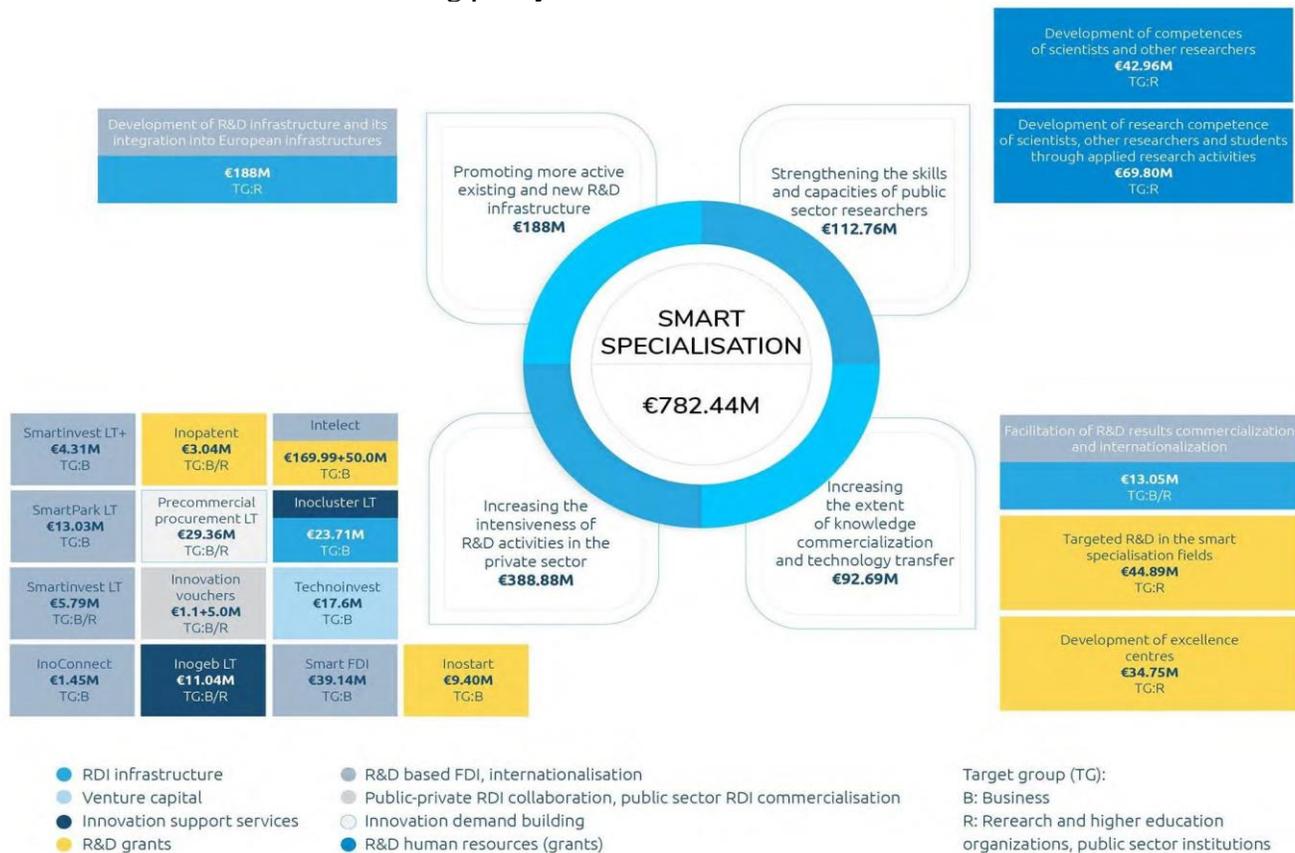
In order to encourage the transformation of national economy and its competitiveness, the Programme forms the basis for the smooth and effective development of the R&D&I priority areas by means of relevant instruments and coordination of actions of all institutions as well as stakeholders interested in the R&D&I development.

During the period of 2014-2020, considerable attention is devoted to a high value-added economy. About 10 percent EU funds are allocated for R&D&I promotion, about 8% - promoting small and medium-sized businesses. These funds are used to increase:

- the number of new innovative enterprises and to accelerate technological modernization,
- the share of innovative Lithuanian companies cooperating with higher education institutions until 2023 from 9.8% to 12.8%.

Finally, also it aims to promote integration of at least 4 Lithuanian research infrastructures into international research infrastructures.

Table 3. Scheme of EU funding policy mix in Lithuania for 2014-2020



Source: MOSTA

CURRENT S3 PRIORITIES

Updated version of The Programme on the Implementation of the Priority Areas of Research and (Socio-Cultural) Development and Innovation (Smart Specialisation) and their Priorities was approved on the 24th of July, 2019 by the Resolution of the Government of the Republic of Lithuania No 760. In the new, updated S3 programme, based on the interim evaluation of progress in the implementation of the S3 and past Action Plans, there are identified 7 priorities for R&D&I:

- 1. Energy and sustainable environment**, implemented through these themes:
 - Enhancing interoperability between distributed generation and centralized generation, grids and energy efficiency systems;
 - Meeting the needs of existing and new end-users, strengthening energy efficiency and awareness;
 - Development of renewable biomass and solar energy and waste recycling.
- 2. Health technologies and biotechnology**, implemented through these themes:
 - Molecular technologies for medicine and bio-pharmacy;
 - Advanced applied technologies for personal and public health;
 - Advanced medical engineering for early diagnosis and treatment.
- 3. Agro-innovation and food technologies**, implemented through these themes:
 - Sustainable agro-biological resources and safe food;
 - Waste-free recycling of bio-raw materials into valuable components.
- 4. Novel production processes, materials and technologies**, implemented through these themes:
 - Photonic and laser technologies;
 - Advanced materials and structures;
 - Flexible product development and manufacturing technologies.
- 5. Smart, Green and Integrated Transport**, implemented through these themes:
 - Intelligent Transportation Systems;
 - Technologies / models for international corridor management and intermodal integration.
- 6. ICT - Information and Communication Technologies**, implemented through these hemes:
 - AI - Artificial Intelligence, Big Data and Distributed Data;
 - IoT – Internet of Things;
 - Multimodal Analysis, Processing and Deployment;
 - Cyber Security;
 - FinTech - Financial Technologies and Blockchains.
- 7. Inclusive and creative society**, implemented through these themes:
 - Modern Educational Technologies and Processes;
 - Design and Audio-Visual Media Technologies and Products;
 - Social and Cultural Innovation for the Development of Societal Development Products and Services, Innovative Business Models;
 - Flexible and Applied Process Control Technologies.

GOALS FOR UPDATING S3

During the design of Lithuanian S3 in 2012-2014, an interim evaluation and possible correction of the programme were hard coded into the Government decree, creating not only a mandate to perform it, but a real anticipation among all stakeholders as well.

Lithuania has allocated around €800 million (with ESIF) to its S3 during the lifespan of 2014-2020 programming period. Main implementing ministries, the Ministry of Economy and Innovation and the Ministry of Education, Science and Sport – have initiated 22 measures, targeting businesses, researchers, research institutions, as well as business – research collaboration projects. The design of S3 based on 6 broad priority areas, which translated into 20 specific priorities, going down to the level of technologies.

More than 600 business sector projects and 200 research projects have been funded so far, and about half of the allocated budget was contracted until the end of the 2018. Only one priority did not attract more than 100 projects, and only 9 priorities out of 20 had accumulated funds above €10 million. Priorities that received most of the funding were: molecular technologies (€32 mil), functional materials (€28 mil), and laser technologies (€17 mil). The concentration of investments is insignificant, mainly due to low intensity of financing. 45% of the applications were rejected, mainly due to their proposals' lack of R&I activities. Too detailed a specification of priorities in the official documents can become an obstacle for innovative ideas, because the evaluators would look for certain keywords rather than the logical connection. “Super-priorities”, meaning those that would perform in every aspect of intervention, have not emerged yet.

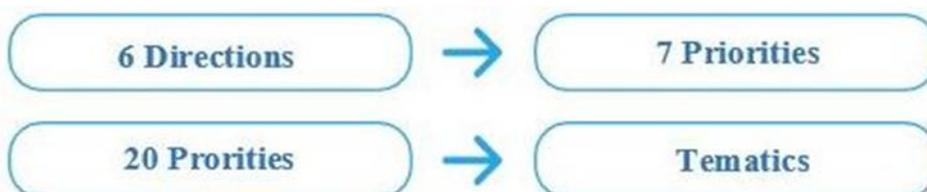
The process of interim evaluation of Implementation of the Programme and its Action Plans started in the end of 2018, as foreseen in the regulation and was finalized in July 2019. Although it is too early to discuss the impact of S3 for the economy of Lithuania, it is possible to understand the “traction and direction” of implementation, to search for various signals and take actions. Along evaluation of available data from monitoring, the official EDP process was re-established, involving relevant stakeholders. Overall, 130 participants from research and business fields participated and 42 workshops were organized, in view of assessing the policy mix, the relevance of the priorities and other criteria.

At the end of 2018 year an Interim Evaluation of the S3 Program Progress was carried out. After analyzing the evaluation results and after assessing the potential and future perspectives of the individual priorities, there were presented detailed conclusions, recommendations and possible scenarios for further investments in the relevant areas and the formulation of new thematic directions.

On the basis of the interim evaluation there was prepared 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, that was approved on the 24th of July, 2019 by the Resolution of the Government of the Republic of Lithuania No 760.

After taking into consideration the monitoring data and results of S3 implementation in the beginning of the EU financial period of 2014 – 2020, it was decided to abandon the logic of two-level hierarchy S3 priorities and stay with the broader and more inclusive single level. Out of 6 priority areas and 20 priorities, 7 priorities were reformulated with the involvement of EDP (Entrepreneurial Discovery Process) stakeholders and One Roadmap – Implementation Action Plan (Table 5)

Table 5. S3 Changes



The main reasons to choose the "scaling up" scenario are based on these arguments:

1. The "scaling up" scenario helps to secure investing in smart specialization direction sustainability and continuity, maintaining the main investment directions;
2. This change simplifies project selection procedures that should increase science and business involvement in implementation of R&D measures;
3. The simplified structure allows the implementation of complex project, that integrate different R&D technologies;
4. Reduction of administrative burden (out of 20 actions plans there remains only 1);
5. Increase of effectiveness and accuracy of monitoring for evaluation of the impact of smart specialization' priorities on Lithuania' competitiveness;
6. Performing the largest number of projects priorities with above median scientific and business indicators, in financial terms did not accumulate significantly distinguished amounts in relation to other priorities. Systematically most applications are rejected for absence of R&D activities;
7. The situation where R&D measures are not currently using all planned EU funding, presupposes that even with emerging of bigger amount of R&D projects – planned investment would be sufficient for both the strongest and newly appearing priorities;
8. Through scaling up of priorities "second" level priorities are not eliminated: they are integrated by updated keywords and it provides background for better implementation of R&D projects, aimed to achieve S3 goals.

It was decided to renew the list of corresponding technologies (as the previous one was from 2012) in the new priorities, although their titles/designations remain almost the same. The further project selection should be based on the potential to address important problems/societal challenges rather than integrate priorities' specification. This will allow to receive more applications and encourage further cross-sectorial approaches.

After approval of updated S3 Programme, the unified and simplified S3 implementation Action plan was approved by the Ministry of Education, Science and Sport (Ministerial Order 30-08-2019 No.4- 498/V964, further – Action plan).

This Action plan was consolidated form 20 different roadmaps/ action plans, and in this version, there were excluded too technical level of technological descriptions (these technicalities were excluding many companies from participation in support schemes).

S3 IMPLEMENTATION PLAN AND MECHANISMS

The implementation of the S3 Programme in Lithuania is organized by the Ministry of Education, Science and Sport and the Ministry of Economy and Innovation (or their authorized institutions) and coordinated by the Coordination Group for the Implementation of the Research and Experimental (Social, Cultural) and Innovation Development Priorities (hereinafter referred to as the Coordination Group).

The Coordination Group consists of representatives of the Office of the Government of the Republic of Lithuania, the Ministry of Education, Science and Sport, the Ministry of Economy and Innovation, the Ministry of Finance of the Republic of Lithuania, other state institutions and socio-economic partners.

Implementation of the S3 requires widest possible involvement of business entities and science and study institutions in Joint Projects. Implementation of the Joint Initiatives is organized according to the Provisions of the Joint Initiatives Procedure by the Agency for Science, Innovation and Technology – MITA.

MITA is one of the main institutions, responsible for implementation of S3 and promoting the collaboration between businesses and science and study institutions. This governmental agency is

organizing discussions of the implementation of the Programme and Individual R&D&I priority action plans with the process participants and other stakeholders from both public and private sectors.

MITA is responsible for the preparation of proposals to the stakeholders, organization of information seminars and partner search events, activities of collaboration between science and study institutions and other public and private entities in order to encourage their joint participation in the projects to be implemented under the study and RDI policy measures.

MITA is also providing consulting to economic entities on the possibilities of applying the R&D&I results in the production of high value-added products.

To ensure the quality of the results, MITA may hire experts competent in the relevant R&D&I priority areas for the implementation of the Agency 's activities (an expert per area).

Currently MITA is also ensuring the process of coordination of the group work in each S3 priority by allocating existing resources and expertise through various projects and budgetary means.

S3 MONITORING MECHANISMS IN LITHUANIA

S3 is a large-scale public policy construct. The complexity of the strategy also leads to a complex and difficult process of monitoring.

The monitoring and assessment of the implementation of S3 in Lithuania, the R&D&I priorities and the R&D&I priority action plans is organized by the Government Strategic Analysis Center – STRATA (prior Centre for Research and Higher Education Monitoring and Analysis – MOSTA) This

Governmental organisation is responsible for the compilation of data on the monitoring, ongoing analysis and assessment, summarization of the data, and its timely submission to the Coordination Group and other stakeholders as well as for the provision of information intended for publication.

STRATA is constantly looking forward for insights and observations on how the monitoring methodology could be improved, or what could be added for a more precise assessment of the situation and its changes. This organisation is responsible to organize an interim assessment of each R&D&I priority action plan upon expiry of 2 (two) years of approval of such plan.

On summarization of the interim assessment results, STRATA submit to the Coordination Group its report and well-grounded proposals for further action related to the implementation of the Programme and/or individual R&D&I priority action plans.

On completion of the Programme, STRATA will organize the final assessment of implementation of each R&D&I priority action plan. On summarizing the final results of the assessment of the impact of implementation of all the R&D&I priorities on the R&D&I development and competitiveness of the economy, STRATA is obliged to submit a report to the Coordination Group together with proposals and recommendations for promoting further R&D&I development.

In order to perform its functions STRATA may attract additional competences of Lithuanian and/or foreign experts.

EXISTING TOOLS FOR INVOLVEMENT OF QUADRUPLE HELIX STAKEHOLDERS

Technologies, such as Internet, have acted as pioneers in open innovation models, enabling the direct involvement of users and generating a cross-cutting impact on society as a whole.

S3 strategies are based on open innovation models in which, besides companies, research and innovation stakeholders and public administrations, ordinary citizens, as the main beneficiaries and users of innovations, should also be present.

Accordingly, implementing S3 strategies requires a step up from a triple-helix model (based on interaction between research and innovation stakeholders, the public administrations and companies) to a quadruple-helix innovation model in which *ICT is the basic enabling technology* and which includes users of products and services, placing them at the center of the innovation process.

What is Quadruple Helix Model? The research and innovation stakeholders that represent key local actors from government, research and scientific institutions, companies and citizens, which engage in bottom-up collaborative processes in innovation policy and challenge the traditional top-down policymaking process.

In the quadruple-helix innovation model promoted by S3 strategies, the public administration is called on to play an active, cooperative role in innovation processes.

Good example about how citizens are involved in implementation of S3 is Implementation of Pilot initiatives, that are worked through with the help of Smart up BSR project. During 2019 there were initiated and implemented two pilot projects, that both aim to attract citizens in the creation process of new technologies.

During International Port Technologies hackathon “Portathon Baltic 2019”, that was taking place on September 2019, more than 80 participants from all Europe were working together to propose new ideas in the field of digitalization in logistics, automated port equipment, digital port terminals and smart port ecosystems.

Another on Pilot project that concentrates on encouragement of citizens to take active role in the development of the technologies, related to safety and security. There was organized Delta Navy Hackathon on October 2019. Considering the specific maritime smart city topic, Delta Navy Hackathon was held in a Lithuanian Naval Force headquarters and supply ship “Jotvingis”.

With involvement of main stakeholders of maritime ecosystem, IT/engineering field qualified citizens, it is intended to take advantage of innovations to improve safety and living standard of the population by creating the following solutions:

- Personnel monitoring system;
- Laser communication;
- Search/environmental analysis drone (sea launch).

THE REGIONAL PERSPECTIVE TO NATIONAL S3: KLAIPEDA CASE

Smart specialization is an important factor that integrates all areas of government, policy makers and business representatives from all areas of the regional development. It is clear that the development and growth of the region cannot be achieved without smart specialisation.

Klaipėda region includes 7 municipalities: the cities of Klaipėda, Palanga and Neringa, as well as the municipalities of Klaipėda, Šilutė, Kretinga, and Skuodas districts. Klaipėda region itself has no S3, it is part of Lithuanian national S3 – thus, the region always needs to ensure that its interests are reflected in the national strategy, which is also a framework document for the governmental investments.

When Lithuania was preparing the directions of smart specialization and approving them in 2015, meetings of various work groups have been organized and surveys have been conducted. The representatives of business and government of Klaipėda region were also invited to joint these groups. Klaipėda region has not yet identified its specialization at that time. Only the city of Klaipėda had prepared the strategic plan of the city for 2013-2020. The following priorities have been stipulated in this plan:

- Creation of the environment favourable to the development of industry, business and knowledge economy;
- Development of sustainable infrastructure;
- Development of the port city;
- Improvement of the living conditions and strengthening of social security;
- Development of education and culture.

As the year of 2017 progressed, active discussions on the importance of defining the directions of smart specialisation of Klaipėda region as well as the process of their identification were started.

Klaipėda Science and Technology Park together with the social partner of the project Smart-up, the Association of Klaipėda Region Municipalities, invited the representatives of Klaipėda region municipalities, business and science to the discussion in order to define the smart specialisation of Klaipėda region. Each municipality as well as its specialization has been analyzed during the discussions:

- Klaipėda city is heavily specialized in industry. The foundation of the region is transport and storage. The ice-free port is used by many export-oriented Lithuanian companies and it creates conditions for the establishment of highly competitive manufacturing industries in the region.

The city also specializes in transport and the manufacture of equipment, and this concentration is growing. There are several large shipyards, dockyards of yachts and water structures in the city. The region is also specialized in furniture manufacturing – the companies established in the city include woodworking, preparation of intermediate wood production as well as furniture assembly.

- In recent years, the specialisation in the chemical industry emerged in Klaipėda district municipality. Klaipėda district has a strong specialisation in the sectors of construction, wood and furniture production. Land transport is greatly developed – many companies providing cargo transportation and storage services are established in Klaipėda region.

- Most of the economic activities in Kretinga district is generated by a longer chain – in non-locally focused activities. This leads to a broad spectrum of sectors falling within the definition of the specialisation. One of the emphasized specializations – the region has a strong forestry – wood products value chain. The sector of furniture manufacturing is also present, though no large cluster has yet formed. Kretinga also has a specialized metalworking.

- The main specialization of Palanga and Neringa cities is tourism and catering.

- Šilutė district has several strong industrial specializations. One of them is furniture manufacturing; even several large factories operate in the region. Wind energy is being developed as well. The region also specializes in lower value-added sectors, such as agriculture, tourism and catering as well as constructions.

- Skuodas district is poorly specialized – most of the economic activities in the region is generated by a short chain – in locally focused activities.

There were organized four meetings, that resulted in formulation and approval of general direction of blue growth of Klaipėda region (Table 6).

Table 6. General direction of blue growth of Klaipėda

MARINE ECONOMICS	BIO-ECONOMICS	CREATIVE AND SERVICE ECONOMICS	ADVANCED INDUSTRIAL ECONOMICS	SUSTAINABLE COASTAL AND MARINE TOURISM	INNOVATIVE ORGANIC AGRICULTURE
Integrated port logistics industry complex. Development of LNG technology and its use.	Production of innovative bio-products. Production and use of renewable energy. Recycling of biomass and waste. Development of bio-technology and its application in the aquaculture.	Development and application of digital solutions in logistics, transport and industry. Centres of professional services. Summer Bureau of Lithuanian and foreign business.	Production of high value-added electrical equipment, vehicles. Development and application of automation solutions in logistics, transport and industry.	Health promotion (use of resort resources) and recreation. Cruise tourism. Active tourism. MICE tourism.	Resource-efficient fisheries. Agro-innovation focused on the development and processing of innovative raw materials.

Since Klaipėda region itself has no S3, it is part of Lithuania national S3 – thus, the region always needs to ensure that its interests are reflected in the national strategy, which is also a framework document for governmental investments. Also, it is important to mention that Klaipėda port has a big influence for all Klaipėda region. At the time EU is still leading the Maritime development globally, the challenge for the regions like Klaipėda is to found the way to benefit on being frontrunners in application of the technologies, gaining enough knowledge and capacity to transform local Maritime industries to a higher added value products and services. Growing from port cargo handling company to equipment producer, shipyards stepping into the autonomous shipping technology suppliers is of high importance.

Klaipėda Port challenges were analyzed in organized Smart-up Innovation camp in Palanga (Lithuania, 13-15 June 2018). Klaipėda Science and Technology Park were happy to receive ideas from workshop groups for how to solve Klaipėda Port challenges and it was decided to generate a pilot that would generate new ideas and solutions for port authority, companies who perform in ports and the entire port community. It was set the main task for the pilot - to analyze 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. It was decided that the best type for pilot is Hackathon – this is a 48 hours marathon, where participants (port authority representatives, companies, experts, scientists, municipality representatives) and teams pitching their ideas and inviting other participants to join and work on idea/prototype together.

The integration of the smart specialization priorities of Klaipėda region into S3 was agreed during the analysis of these directions with the interested groups. As a result, the representatives of Klaipėda Science and Technology Park initiated meetings with the representatives of individual thematic groups of S3, and presented the innovation needs of Klaipėda region:

1. Transport and logistics:

- Design of clean vehicles;
- Digitalization and the development of new technological solutions (increasing efficiency and safety at work as well as production), their integration and unification;

- The appearance of the transport logistics (maritime-oriented) unit (faculty/institute, etc.) at Klaipėda University.

2. Industry 4.0:

- Creation and development of the competence centers in the logistics sector;
- Design and development of the autonomous port systems and logistics solutions;
- Storage and processing of the “Big data”.

3. Energy:

- Exploitation of geothermal energy potential;
- A perspective for the development of the offshore wind farms;
- Wider use of LNG.

The preparation of the strategy of economic development of Klaipėda for 2030 was initiated in 2018, in which the representatives of Klaipėda Science and Technology Park also participated and made their suggestions.

In the Klaipėda Economic Development Strategy 2030, approved in 2019, these priority axes are foreseen:

- Marine economy (integrated complex: port, logistics, industry; LNG cluster; maritime and health promotion tourism);
- Bioeconomy (Bio-economy cluster: for chemistry, timber, biotechnology businesses, education institutions; blue technologies; renewable energy);
- Economics of the advanced industry (“Pramonės 4.0”- competence centre);
- Creative and service economy (service centres; creative industry cluster; MICE (business, conference tourism)).

These axes are reflected in the current Lithuanian S3. All of the approved smart specialization directions correlate with the directions and priorities of the Klaipėda region.

When speaking of individual areas smart specialization in both initial and current S3 – transport and logistics are one of the priority directions of the smart specialization strategy directions of Klaipėda region, due to the seaport and the well-developed logistics network in Klaipėda. While implementing the S3, the integration of different transport chains and the technologies of clean transport creation are of particular importance. The main challenge in the Klaipėda region is to strengthen the development and integration of the transport sector, which would create a complete chain of services. To this end, it seeks to integrate the potential of all municipalities, research institutions and businesses in the region and to have a consensus to reach the breakthrough.

While analyzing the priority of transportation, the creation of smart and clean (low-emission) vehicles is very important direction for Klaipėda region. The joining of the potential of the transport and energy sectors (ecological aspects, clean fuel LNG, LBG) is also seen here. The use of the liquefied natural gas (LNG), as a fuel, is the transitional type of fuel – this is the niche and the opportunity for the region.

Klaipėda region aims to implement the scientific research and experimental development (SRED) projects in the transportation priority axis, create and test smart transport systems and technologies, by using not only the LNG, but also the liquefied biogas (LBG). The development of the environmentally friendly vehicles, clean and smart transport - these directions were proposed to be incorporated into the current S3.

Upon submitting a proposal to the S3, (a meeting was organized with the transport and logistics coordinator (RIC3) dr. Algirdas Šakalys to present the main goals, interests and positions in this sector in Western Lithuania) Klaipėda region aimed to emphasize, that priority subjects should appear in the smart specialization, in which the implementation of the systems of autonomous ports, creation and development of logistics solutions could be deployed (autonomous ports and logistics, digitalization). The representatives of Klaipėda region aim to join the advantages – the port, the logistics service network

and the higher education institutions preparing the specialists – they have in this field.

Another direction, that is very important to the region of Western Lithuania, focuses on energetics and sustainable environment. One of the exclusive sources of renewable energy in

Klaipėda region is the wind. Feasibility studies regarding the potential of wind turbines in the region have been carried out. The region discusses the creation of the “offshore” wind turbine park and it added value. This is the distinctiveness of the region in the national context. There are also possibilities of developing other energy industries – wave energetics, ocean energetics technologies floating solar power stations and etc. The Western region of Lithuania has not taken full advantage of the geothermic energy – this is also one of the aims of the region. In conclusion, we may declare that the actual theme of the smart specialisation priority “Energetics and Sustainable Environment” is the obtaining (creation) of additional products from the alternative energy and its surplus.

The region’s innovation strategy is not possible without the breakthrough of the industry (priorities: “New processes, materials and technologies of manufacturing”; “Informational and communication technologies”) – development of new business process management models focused on the creation of added value in production. This is automatization / connections / cloud computing / internet of things / big data / system integration / digitalization of industry. The Klaipėda region proposes retaining the priorities of the smart specialization in the current S3 “New processes, materials and technologies of manufacturing”; “Informational and communication technologies”, as it has the potential to deploy e-solutions, big data, cybersecurity and other solutions through the private and non-governmental sectors.

Health technologies and biotechnology is a relevant priority to the region of Western Lithuania – here exists a great potential both from the scientific (Klaipėda University) and business side to jointly develop and implement new technological solutions of diagnostics for rehabilitation and therapy services. It is extremely important that the current S3 (2020 – 2030) would retain the theme of “The Advanced Applied Technologies for Personal and Public Health” and the theme specificity of this priority.

It is also important for the Klaipėda region to retain a priority of “An Inclusive and Creative Society” in the S3, because of the great potential of the creative industries, which is to be promoted to develop the non-technological innovations. The Klaipėda region aims for the cultural innovations, which include the creative innovations related to other social and cultural development, to be included in this priority. Upon implementing this priority, it also seeks to focus on collaborative and blended learning technologies. It is important for the Klaipėda region to ensure an effective communication with educational institutions, form a clear understanding of the future specialists about the ongoing processes, the constantly changing need of competences (STEM learning from an early age).

Solving Grand Societal Challenges for Sustainable Future in Baltic Sea Region:

How to tackle Grand Societal Challenges like climate change and healthy ageing via smart specialization in Baltic Sea Region? How to promote circular economy? How to attract relevant businesses inclusively? How could smart specialization approach contribute to solving grand societal challenges?

Smart sustainable cities are the vision and future epicentres for human activities, initiatives, and projects for addressing the grand societal challenges. But lack of awareness and collaboration between different stakeholder groups is a major obstacle undermining sustainable development and cooperation.

Smart specialisation approach offers the quadruple helix as a base for more open collaboration.

The working group outlined the key questions for the roadmap of building a smart city:

What is a smart city? What are the indicators for measuring “smartness” and progress? How can a smart sustainable city ensure well-being of its inhabitants?

The results of the working group focus on developing several key elements of the smart cities:

- platforms for citizen participation;

- innovation units for rapid experimenting;
- communication strategy to overcome the divide between the stakeholders.

CONCLUSION

Smart specialization in Lithuania is still on his way to reach strategic goal to increase the impact and share of high value added, knowledge-intensive and highly qualified labour-intensive economic activities in the GDP by structural changes of the economy.

The main objectives that have to be achieved cover creation of innovative technologies, products, processes and/or methods and, using the outputs of these activities, responding to global trends and long-term national challenges. We also have to concentrate on increase of competitiveness of Lithuania's legal entities and their opportunities for establishing in global markets – commercialisation of knowledge created in the implementation of the Priorities.

So, generally speaking about S3: the concept of Smart specialization and its implementation reality had strong positive results. It seems to be the best implemented process so far to unify the concept R&I priorities in the EU and beyond. A lot of decision makers and stakeholders from academia and business adopted similar understanding of the concept and similar vocabulary to describe preferences and taken actions.

S3 slowly turns into a leverage to change the culture of the (R&I) policy making as it came with strong analytical homework necessity and higher level of justification of decisions, so it is expected to have long - lasting effects on the evidence-based policy making as well.

Development and implementation of S3 has initiated analytical approach to R&I policy cycle and a swarm of projects/tools/practices/etc. It also provided transparency and accountability, interactive monitoring systems and constant sharing of good practices and solutions.

The level of Lithuanian innovation, digital competitiveness and industry productivity is rising, but the progress is not enough. In order to reach the ambitious goals, documented in the strategic documents, Lithuania needs to cope with challenges associated with the low level of innovative capacity, not sufficient investment in R&D, technology and innovations, weak integration into global value chains and unattractive research systems as well as quite sluggish digitization.

As all EU countries are preparing for the next financial period of 2021-2027, the new round of preparation of S3 will be followed in the nearest future. During the updating process of S3 during 2018-2019, Lithuania already did some homework and prepared the documents that might be a good base for the next qualitative round of new generation S3. New S3 will include not only statistical analysis, monitoring data and new perspectives of EU policies in Smart specialization areas, but also rich experience of EU counties and lessons learned.

Even if the current period of implementation of S3 in Lithuania has not finished yet, but it is important to start discussions on the new period S3 as soon as possible. The main focus should be on:

- Considering the amount and scope of priorities and focus on the horizontal, largest impact having priorities, regardless of their sector;
- Considering if all priorities that have different capacity levels, should have equal attention, leaving natural competition to decide which ones make the biggest impact, or to put them into different levels of priorities and foreseen different implementation mechanisms.
 - Ensuring the continued engagement of science and business in the process by the ways of facilitation and coordination of science-business collaboration
 - Ensuring the integration of skills into S3;
 - Providing interim evaluation and opportunity to adjust priorities during the S3 implementation process.

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