

Multi-Level Governance of Innovation and Smart Specialisation



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Foreword

Science Leads the Way in Shaping the Upcoming 25 Years of the CBSS

Research excellence is a key factor to the continuous successful advancement of the CBSS long-term priority *Sustainable & Prosperous Region*. Likewise, frontier research emerges as one of the core threads of the *Regional Identity* priority, strengthening the global awareness of Baltic Sea Region as a European innovation hub.

This report offers a preview into the breath-taking wealth of knowledge, which the Baltic Sea Region offers to the world in the global pursuit to address societal challenges. Namely, over the last years, considerable investments have been made in large scale analytical research infrastructure. Two most telling examples of the European Strategy Forum on Research Infrastructures are the European Spallation Source and the European X-ray Free Electron Laser. These, as well as other analytical facilities of national and regional importance based across the Baltic Sea Region, offer a novel source of research performance.

Therefore, the report "Multi-Level Governance of Innovation and Smart Specialisation" provides a new impetus to the debate on how the existing research potential of the Baltic Sea Region should help strengthening the position of our macro-region as a test-bed for globally renowned brands capable of swiftly adapting to the ever-changing market needs in a sustainable and responsible way.

To further enhance this vision, the CBSS Secretariat has mapped various research and innovation trends across the area of the Four Regional Councils of the North. Such an outreach proves that the Baltic Sea Region remains an outward looking area, which doesn't celebrate only its own achievements but seeks to understand how they fit in a wider landscape of domain-specific developments.

The CBSS Swedish Presidency 2017 – 2018 serves as a timely occasion to conclude the celebration of the CBSS 25th anniversary with an inspiring vision for the upcoming 25 years of the Baltic Sea Region-wide cooperation.

Ambassador Maira Mora

Director General of the Council of the Baltic Sea States Secretariat

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The views expressed in this report, as well as the information included in it, do not necessarily reflect the opinion or position of the CBSS and in no way commit the organisation.

This report was prepared by:

Zane Šime, Communication & Research Coordinator at the CBSS Secretariat, in cooperation with National Representatives and Focal Points of the Baltic TRAM High Level Group, as well as Policy Area Coordinators of the EUSBSR PA Innovation, as part of the Baltic TRAM (Transnational Access in Macro-Region) project. Likewise, special acknowledgement is expressed to the representatives of Presidencies and Chairmanships, as well as Secretariats of the Four Regional Councils of the North for their responsiveness in the report's preparation.

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Baltic TRAM in Brief:

The Baltic TRAM project offers companies free access to state-of-the-art analytical research facilities across the Baltic Sea Region, providing technical and scientific expertise to help solve challenges associated with developing new products or services.

The overall objective is to boost innovation, secure the implementation of smart specialisation strategies, and encourage entrepreneurship by supporting small and medium size enterprises, thus contributing to the regional effort of making the Baltic Sea Region innovative, sustainable and competitive.

To achieve this, Baltic TRAM also feeds into the transnational research and innovation agenda. It performs benchmarking analysis on national roadmaps for research infrastructures and smart specialisation strategies, and provides recommendations to policy makers.

Baltic TRAM builds on the findings of Science Link, an initiative which received EU project funding 2012-2014. Science Link is currently operated as a network.

The purpose of Science Link is to encourage innovation and entrepreneurship in the Baltic Sea Region, to strengthen the region's competitiveness in a global context. It supports industrial research with synchrotron radiation and neutrons at research facilities in northern Europe. The aim is to create awareness of the possibilities offered at research facilities in the region and to show how research and development at these sites can contribute to innovation within European industry.

Project budget: 4,157,013.60 EUR

Interreg Vb Baltic Sea Region Programme contribution: 3,207,699.40 EUR

The project runs from March 2016 until the beginning of 2019.

Baltic TRAM website: www.baltic-tram.eu

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Abbreviations

TRAM	Transnational Research Access in the Macroregion
BSR	Baltic Sea Region
BSR Stars S3	Smart Specialisation Through Cross-Sectoral Bio-, Circular- and Digital Economy Ecosystems
CORDIS	Community Research and Development Information Service
CSTD	Commission on Science and Technology for Development
DESY	Deutsches Elektronen-Synchrotron
DG RTD	Directorate-General for Research & Innovation
ECEI	European Cluster Excellence Initiative
ECOSOC	(United Nations) Economic and Social Council
EPSC	European Political Strategy Centre
ESFRI	European Strategy Forum on Research Infrastructures
EUSALP	EU Strategy for the Alpine Region
EUSBSR	EU Strategy for the Baltic Sea Region
HA Neighbours	(EUSBSR) Horizontal Action Neighbours
ICT	Information and Communication Technologies
INKA	Innovative Cities
IPPC	Intergovernmental Panel on Climate Change
IREC	Industrial Research Centre
JRC	Joint Research Centre
FP8	Framework Programme 8 <i>Horizon 2020</i> (2014 – 2020)
FP9	Framework Programme 9 (post-2020 period)
GSF	Global Science Forum
NCM	Nordic Council of Ministers
OECD	Organisation for Economic Co-operation and Development
PA	(EUSBSR) Policy Area
PA Education	(EUSBSR) Policy Area Education, Research and Employability
PA Innovation	(EUSBSR) Policy Area Research and Innovation
PP	Permanent Participant
RIS	regional innovation systems
RIS3	Research & Innovation Strategy for Smart Specialisation
R&I	Research and Innovation
R&D&I	Research, Development and Innovation
SAO	Senior Arctic Officials
SDG	Sustainable Development Goal
SHOK	Strategic Centres for Science, Technology and Innovations
S3	Smart Specialisation Strategy
UArctic	University of Arctic
UN	United Nations

UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNESCO	United Nations Educational, Scientific and Cultural Organization
WG	Working Group

Graphs & Charts

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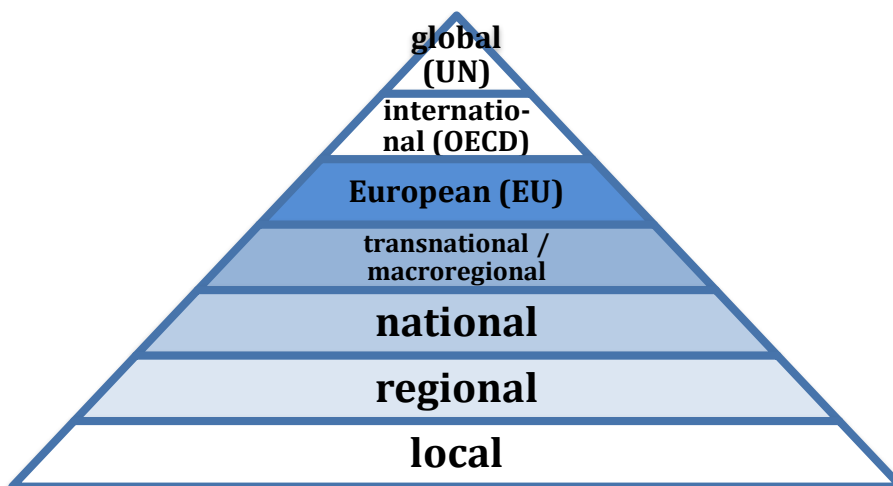
Introduction

Bearing in mind the crucial role played by innovation in ensuring the well-being of the Baltic Sea Region (BSR), this Council of the Baltic Sea States (CBSS) report on multi-level governance of innovation and smart specialisation serves as one of the first more nuanced insights elaborated in line with the high-level guidance outlined during the **CBSS Reykjavík Ministerial**. The policy analysis captured by this report indicates how the rather recently endorsed CBSS Science, Research & Innovation Agenda is contributing and will be advancing in the upcoming years the CBSS long-term priority Sustainable & Prosperous Region.

Firstly, the aim of this report is to analyse the global, international, European and transnational or macro-regional governing structures of innovation and smart specialisation relevant to the CBSS Member States in the science-business cooperation context. Therefore, this report serves as the next building block in terms of advancing thinking on innovation and smart specialisation beyond the regional and national frameworks (and few local examples) outlined in the **BSR Policy Briefing 4/2017 “National Innovation and Smart Specialisation Governance in the Baltic Sea Region: Laying Grounds for an Enhanced Macro-Regional Science-Business Cooperation”** published by Centrum Balticum. Such analysis ensures that Baltic TRAM activities are explained in a wider context and highlight how Baltic TRAM findings on science-business cooperation translate in the advancement of policy milestones defined on various governance levels.

In order to provide a coherent perspective on such closer cooperation opportunities, the report takes a comprehensive look at global, international, European, transnational or macroregional initiatives and policy documents governing research and innovation matters. Therefore, it also serves as a panoramic manual for audiences interested in exploring the existing diversity of initiatives and policy support tools. Thus, the report addresses challenges identified in the **Lund Declaration 2015**, as well as builds on the 2014 **Conclusions on the Implementation of the Roadmap for the European Strategy Forum on Research Infrastructures (ESFRI)** issued by the Council of the European Union.

Graph no. 1: General Structure of Multi-Level Governance Model of Innovation Policy



The report is guided by a multi-level governance perspective. Thus, it brings a new dimension in the transnational debate by focusing not solely on regional, national and European governance levels (as

shown in the graph no. 1) but taking an unprecedented full spectrum view with the previously stated BSR Policy Briefing being the first part in this process of analysis elaborating on the local, regional and national governance policy implementation landscape. More specifically, the new approach presented in the report is an elaboration not only on Baltic TRAM's contribution to the advancement of multi-level innovation governance, but it also brings a clarity and clearly synchronised view of various governance initiatives. It is of relevance in the context of showcasing the practical implementation dynamics behind the global and international commitments taken up by the CBSS Member States in such forums as the United Nations (UN) and Organisation for Co-operation and Development (OECD).

In terms of the UN, the report puts under the magnifying glass SDG 9 to explore the relevance of its target 9.5 to the Baltic TRAM planned and implemented activities. Likewise, the report also offers a more nuanced insight in how the **OECD Innovation Strategy 2015** is contributing towards the SDG 9 advancement. It should be also noted that the earlier mentioned BSR Policy Briefing serves as a good point of departure for further exploration of OECD's work, since it elaborates on OECD's role in shaping the innovation and smart specialisation debate in a number of analysed countries. An OECD Horizon Scan of Megatrends and Technology Trends in the Context of Future Research Policy facilitated the discussions towards Denmark's RESEARCH2025 (Mickus et al., 2017, p. 6). Finland's Strategy and Roadmap for Research Infrastructures 2014-2020 is influenced by the reflections of OECD's Global Science Forum (Mickus et al., 2017, p. 30).

Likewise, the report is based on major findings of previous studies. For example, it follows the nuanced explanation of clusters in the smart specialisation strategy's (S3) context. Namely, it recognises S3 focus on innovation-intensive sectors in order to enhance the transformation of the specific economy, while clusters might not always be based on the same transformative assumptions. There might be cases when clusters are built around traditional strengths of the given economy. Therefore, in the S3 context only clusters which are tailored to generate new types of knowledge spill overs with potential effect on economic growth are relevant (European Commission, 2013, p. 4). However, the report does not contain classification of clusters according to their correspondence to S3 of their respective countries. Rather it recognises that, if tailored accordingly, the cluster policies can become a valuable contribution to the S3 policy mix and contribute to the S3 implementation success by assembling a part of the necessary critical mass of stakeholders involved (European Commission, 2013, p. 16). It remains the responsibility of states and regions to evaluate which clusters are relevant to their S3 framework and which ones are not.

In a similar manner, the report builds on the EU Strategy's for the Baltic Sea Region (EUSBSR) Policy Area Research and Innovation (PA Innovation) flagship Baltic Science Link. For example, coming back to the earlier discussed cluster domain, the report does not contain listing of relevant clusters, since it has already been covered by "Science Link: Mapping of Existing Cooperation" (see Science Link, n.d.). This serves also as one of the examples how Baltic TRAM avoids duplication of existing activities and builds on earlier findings based on macro-regional activities. In addition, in future publications on Baltic TRAM findings, the CBSS Secretariat will seek to explore the relevance of clusters in terms of their generated transnational science-business ties.

Coming back to the European level commitments, in line with the **European Charter for Access to Research Infrastructures** (European Commission, 2015b), the report provides suggestions how to improve the transnational coordination of science, research and innovation policies in order to ensure more efficient use of analytical facilities. In the spirit of the **Debrecen Declaration** (European Union, 2011), the conclusions and recommendations of this report are aimed also at providing CBSS Member

States with guidelines how to improve their national frameworks as well as policy implementation and monitoring.

Graph no. 2: Multi-level matrix of science, research and innovation policy frameworks and corresponding policy forums¹

Global level	International level	European level	Trans-national level	National level	Regional level	Local level
UN SDGs Economic and Social Council (ECOSOC) Commission on Science and Technology for Development (CSTD)	OECD Innovation Strategy 2015	S3 Platform	Baltic 2030 Action Plan	National R&I strategies	Smart Specialisation Strategy	
				Smart Specialisation Strategy (/ies)	public administration	
		ESFRI	CBSS Science, Research & Innovation Agenda		ESFRI National Roadmap	
				ERA National Strategy		
	OECD Committee for Scientific and Technological Policy	FP8 Horizon 2020	2015 Lund Declaration	EUSBSR (PA Education & PA Innovation)	partners and associates of EUSBSR flagships	
		Multi-stakeholder platform of the European action for sustainability				

Baltic TRAM is based on long-term aspirations of building a sustainable network of interfaces facilitating cooperation between business sector and analytical research facilities for the overall BSR benefit in ensuring its European leading positions in innovation. Findings emanating from the first phase of the network's operation are potentially relevant to the future work of the **European Innovation Council**, which will support researchers interested in building business models on the basis of their performed research (Science Business, 2016, p. 16).

¹ For the sake of conciseness, the graph does not list the major forums of the executive branch of each international organisation listed, such as the United Nations General Assembly, the OECD Council, the Council of the European Union, the EUSBSR meetings of National Coordinators.

² Commitment 4 *Propose an ERA framework and supporting measures*

The complexity of multi-level policy frameworks and forums is depicted in the graph no. 2. It sets out the field in which Baltic TRAM stakeholders operate. Moreover, it provides an overview of frameworks and policy advocacy platforms that could potentially be further aligned or used more actively by corresponding national delegates for the needs of transnational closer science, research and innovation coordination. The next chapters of the report are presenting a more nuanced analysis of each governance level outlined in the introductory part.



1. Global Governance Level: United Nations

The seminal framework for global governance is the **2030 Agenda for Sustainable Development** adopted by the UN General Assembly on 25 September 2015 as an overarching “plan of action for people, planet and prosperity” structured in 17 Sustainable Development Goals and 169 targets (United Nations, 2015, p. 1).

In more specific terms, one of the UN’s milestones in advancing innovation worldwide is the **9th Sustainable Development Goal** called “**Industry, Infrastructure and Innovation**” (SDG 9). The SDG 9 can be viewed from the perspective of best practices where basic research has produced considerable spin-offs. One example featured in the discussions on the crucial role of science for sustainable development is accelerator-based particle physics being crucial to the treatment of such diseases as cancer (Scientific Advisory Board of the UN Secretary-General, 2014, p. 4; UNESCO, 2015, p. 10). Therefore, the SDG 9 supports closer cooperation between basic and applied science. The SDG 9 **target 9.5** is of relevance to Baltic TRAM since the project’s activities contribute in a transnational manner towards enhancing scientific research. Target 9.5 consists of several dimensions:

“Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including by 2030, encouraging innovation and substantially increase the number of research and development workers per 1 million people and public and private research and development spending.”

The target includes a number of dimensions whose topicality to the Baltic TRAM activities should be explained in several respects. Firstly, in line with the spirit of the target 9.5, Baltic TRAM holds the potential of indirectly stimulating upgrade of technological capabilities of industrial sectors across the BSR and the EU.³

Secondly, Baltic TRAM supports the implementation of the target’s aim to substantially increase the number of research and development workers per 1 million people worldwide by 2030, thus feeding into the **indicator 9.5.2**⁴. The project as such does not directly contribute to this suggested activity, for example, by announcing large numbers of employment vacancies, which would feed into reaching this indicator. Nevertheless, facilitated access of businesses to the services provided by analytical facilities is deemed to have a potential positive impact on the steady supply of research offers. Thus, Baltic TRAM helps to sustain and potentially expand the range of employed staff in analytical facilities across the BSR. Likewise, services provided by Baltic TRAM affiliated analytical facilities further a pro-active engagement with the business sector, as well as the participation of small and medium-sized companies in local innovation, thus facilitating the engagement of entrepreneurship systems in the implementation of the 2030 Agenda, as suggested in the discussions taking place in the UN ECOSOC (United Nations, 2016, pp. 4, 6).

Thirdly, Baltic TRAM as an Interreg Vb BSR Programme-funded project, contributes in increasing the public spending towards the needs of unleashing the full innovative potential of analytical facilities, as well as supporting the research communities related to these facilities.

³ Baltic TRAM open call is meant for EU-based companies, thus businesses located outside BSR area are also welcome to submit their enquiries.

⁴ “Researchers (in full-time equivalent) per million inhabitants.” (Sustainable Development Goal Knowledge Platform, n.d.)

In terms of country-specific performance in the context of the SDG 9 aims, Germany can be singled out as a frontrunner, since it is also mentioned in the **UNESCO Science Report: Towards 2030** as the leader among high-income countries in terms of having the highest share of firms engaging actively in innovation due to their considerable investments in process or product innovation (UNESCO, 2015, p. 60). Thus, Baltic TRAM benefits from being led by a project partner emanating from a country with an impressive track record as well as acquired experience and expertise in developing product and process innovation.

The topicality of the target 9.5 is also mirrored in previous UNESCO publications. For example, Poland was praised for its consistent rise in R&D expenditure which has been observed since 2007 although the level of investment is still not sufficient currently to raise Poland's R&D intensity in line with the EU average (UNESCO, 2015, p. 267). Consequently, Baltic TRAM also serves as one of facilitators supporting Poland's efforts in tackling this challenge.

Moreover, since 2010, the Russian government has also introduced a number of incentives aimed at stimulating innovation in the business sector, for example, making "it mandatory for state-owned enterprises to develop innovation strategies and co-operate with universities, research institutes and small innovative businesses" (UNESCO, 2015, p. 353). Moreover, Russia's engagement in such European research centres as the **European Organisation for Nuclear Research (CERN)** based in Switzerland, the **European Synchrotron Radiation Facility (ESRF)** based in France, as well as the **European X-ray Free Electron Laser (European XFEL)** based in Germany (UNESCO, 2015, p. 360), which is also Baltic TRAM associated organisation, mirrors its commitment in advancing basic science and invest public funds in research in close cooperation with its partnering countries in the BSR and beyond it.

To conclude, it should be noted that the UN from its side, steers the science, technology and innovation agenda through the **Economic and Social Council (ECOSOC)** and its advisory body the **Commission on Science and Technology Development (CSTD)**. ECOSOC recognises the importance of regional integration efforts in science, technology and innovation domains. Thus, the report demonstrates how this guidance is being translated in further steps. Consequently, through participation in the Baltic TRAM project the CBSS Member States are also responding to the ECOSOC guidelines to mobilise EU, transnational as well as national resources to strengthen national innovation systems for science, technology and innovation (ECOSOC, 2015, pp. 2-3). Further details on these aspects are outlined in chapter 2 of this report. Moreover, chapter 4 by its focus on UN conventions and observances provides further insight in the multi-faceted support undertaken by the Four Regional Councils of the North feeding also in the delivery of the 2030 Agenda vision.

2. International Governance Level: Organisation for Economic Co-operation and Development

The OECD's work related to the analytical facilities has been organised in the framework of the **Global Science Forum (GSF)** which reports to the **OECD Committee for Scientific and Technological Policy**. "Among the scientific domains that have been the subject of the first type of GSF activity are nuclear physics, high-energy physics, astronomy and astrophysics, radio astronomy, the study of condensed matter, neutron science, high-intensity lasers, proton accelerator-based facilities, structural genomics, grid computing and, most recently, astroparticle physics" (OECD, 2010, p. 2). One of the reasons for elaborating on this discussion platform is its prominence recognised by the European leading subject matter experts in the **ESFRI Roadmap 2016** (ESFRI, 2016, p. 20).

GSF recognises the role of research infrastructure in producing industrial spinoffs with commercial potential (OECD, 2010, p. 7), which in practical terms is mirrored in Baltic TRAM work. Moreover, the forum's work must be praised for its balanced and critical approach towards research infrastructure of a varied scale. Namely, the forum has recognised the complexity of creating research infrastructure roadmaps, since it entails focus on large scale projects and those poses a potential risk of distortions in decision-making by undermining the value of small- and medium-sized projects. "Besides their intrinsic merits, they often play a valuable supportive role in conjunction with the large infrastructures, for instance, as venues for developing and testing instrumentation, and as training grounds for students and young researchers" (OECD, 2010, p. 8). This remark bears relevance also in the Baltic TRAM context, since Baltic TRAM network is built by assembling a great diversity of analytical facilities, starting from the European XFEL, the world's largest X-ray Free-Electron laser, with most of them being of small or medium size.

Moreover, the role of small- and medium-sized analytical facilities in developing new solutions for products manufactured by small and medium sized enterprises bears relevance in the context of the remaining aftereffects of the 2008 financial crisis. The **OECD Science, Technology and Innovation Outlook 2016** recognises that the financial conditions for innovation and entrepreneurship remain difficult, especially for small- and medium-sized enterprises (OECD, 2016d, p. 18). Thus, Baltic TRAM's ensured further support in product development supported analytical research services could offer new impetus in raising the competitiveness of respective size businesses.

Moreover, while Baltic TRAM does not directly initiate joint programming or sharing of research facilities, it does follow the OECD guidance towards reinforcing a joint approach in tackling societal challenges (OECD, 2016d, p. 70). Namely, the Baltic TRAM network of Industrial Research Centres (IRECs) helps to build a wider awareness among businesses in the BSR regarding the diversity of services available in various analytical facilities relevant to the technological advancement of their products. In addition, a good ground towards closer cooperation between the medium- and small-sized research infrastructures was laid in the Baltic States in 2014 when Estonia, Latvia and Lithuania each published a list of their hosted analytical facilities (on the Estonian Research Council, n.d.). This should be seen as one step ahead in terms of offering internationally accessible information regarding the analytical facilities hosted by the three Baltic States.

Further on, the OECD elaborates on innovation as being not a matter of a one siloed policy. It recognises that policy makers face the challenge of acquiring an most optimal mix of policies by disseminating research and innovation components in line with existing policy patterns (OECD, 2015, p. 15, 2016b, p. 1). It should be noted that this reflection is also mirrored in one of the latest foresight reports

commissioned by DG RTD, where the thesis “there are no islands in policy” is used to capture the multi-faceted character of innovation which would form the foundation of a strong and resilient future Europe (Ricci, Sessa, & Weber, 2017, p. 58). Moreover, the **OECD Innovation Strategy 2015** embraces a comprehensive view of innovation multi-level governance since it notes the important role that regional and local policies play in overcoming the barriers hampering the exploration of the innovation potential (OECD, 2015, p. 7). These reflections are in line with innovation policies implemented across the BSR, since, as shown in the BSR Policy Briefing 4/2017, in a number of countries innovation matters are covered by several policies and implemented via various tools or initiatives. Moreover, the EU’s smart specialisation approach, which goes hand-in-hand with innovation thinking, is also supportive of regionally tailored approaches. Thus, an overall appreciation should be noted of advancing the research potential with relevance to the business sector not merely on the national basis but also providing regionally tailored perspectives.

The OECD reflections on the role of research funding highlight the importance of sustained funding allocation to basic research as the key driver towards endured productivity growth and development of innovations at the global frontier. Therefore, the OECD clearly denotes the long- and short-term funding rationale. The public long-term investments serve to compensate the under-investment in basic research of private firms. While the short-term funding serves to look at specific, niche research issues in a projectised manner (OECD, 2015, p. 9). Baltic TRAM is an example how these two types of funding measures are combined in order to promote innovation advancement in the macro-region. On the one hand, the project engages analytical research facilities which are financed for the long-term by publicly allocated funds. On the other hand, the project is funded for a short period of time by the EU’s Interreg Vb BSR Programme in order to establish a BSR-wide network of IRECs which promote the services offered by the analytical facilities to businesses.

3. European Governance Level: European Union

This chapter offers a panoramic view of the EU policy frameworks, which will be addressed in greater details during the transnational governance chapter. It sets out the overall context in which Baltic TRAM focuses on a number of EU-wide initiatives. Nevertheless, it should be pointed out right away that a more elaborate take on these contents will be presented in the latter parts of the report.

3.1. Smart Specialisation in a Wider Context

Smart Specialisation was introduced in Europe as a new approach for “regions to focus their activities in a limited number of domains” and expand knowledge sharing of this specific experience with other peers (Ketels & Pedersen, 2016, p. 37). In line with the **European Action for Sustainability**, smart specialisation is also one of the drivers behind the implementation of SDG 9 in the European setting (European Commission, 2016c, p. 35). In 2014, EU Member States have been encouraged to include “research infrastructures in their Research and Innovation Strategies for Smart Specialisation” (Council of the European Union, 2014, p. 2). Likewise, smart specialisation has been suggested as a crucial enabler for EU’s joint capacity to properly address Societal Challenges (*Background Paper to the Lund Declaration 2015*, 2015, p. 3). Baltic TRAM builds on the reflections and guidance provided in the **Lund Declaration 2015** with a transnational focus on science-business cooperation. Indeed, this report itself serves as an example of putting into action suggestions enshrined in the Lund background paper to “step-up the alignment of strategies, instruments, resources and actors” (*Background Paper to the Lund Declaration 2015*, 2015, p. 2).

Baltic TRAM taps onto the overall advantage of the BSR, demonstrating in practice, a focused approach, since this particular geographic area is known for being pre-occupied with a more limited set of priorities if compared to the smart specialisation implementation in other regions (Ketels & Pedersen, 2016, p. 37). Thus, Baltic TRAM builds on the promising foundations of “home-grown strengths”. Thus, also in line with the spirit of **Debrecen Declaration** (European Union, 2011, p. 2), no Baltic TRAM partner aims to “go silicon”, which in the words of the European Policy Strategy Centre, would mean “trying to match global excellence in disciplines” in which these partners have no prior experience or expertise (Madelin, 2016, p. 10).

Moreover, by raising the overall awareness of business representatives across the BSR regarding the variety of services provided by analytical facilities assembled by or affiliated to the Baltic TRAM network, the project implements earlier provided recommendations to introduce innovative solutions well-known in one BSR country, to the businesses elsewhere, which thus far were not aware of these services (Madelin, 2016, p. 10). This added value is mainly ensured by the work of **Baltic TRAM Evaluation Committee** which jointly agrees on which facility would be best placed to perform the requested analytical task.

Furthermore, the role of Baltic TRAM in advancing the legacy of **EU-Russia Year of Science 2014** should be highlighted. Baltic TRAM translates in action the discussions which revolved around the development of Megascience (*12 Months of Excellence and Cooperation in Science, Higher Education and Innovation*, 2015, p. 36). It is mirrored through, firstly, Russia’s affiliation to Baltic TRAM activities due to its status as the signatory state of the European XFEL convention and one of the main European XFEL shareholders (European XFEL GmbH, 2016, p. 21). This analytical facility, a notable **ESFRI Landmark** (ESFRI, 2016, p. 75), is an associate organisation of Baltic TRAM. Secondly, Russia is one of the CBSS Member States which endorsed Baltic TRAM as an important project for the advancement of science cooperation in the BSR during the first CBSS Science Ministerial in 2016.

3.2. Macroregional Strategies

The macro-regional approach was launched with the pioneering **EU Strategy for the Baltic Sea Region (EUSBSR)** in 2009. These strategies are transnational cooperation platforms, as well as policy shaping forums designed in accordance with the specific needs of each of their covered geographical areas. Due to their adherence to the different EU institutions and strong ties to European policy-making processes, this thematic subsection is placed under the overall chapter dedicated to exploring the European-level agreed frameworks.

Currently, there are four macro-regional strategies put in place. Three of them – EUSBSR, **EU Strategy for the Alpine Region (EUSALP)** and **EU Strategy for the Danube Region (EUSDR)**– deal specifically with research-business interlinks and tailor specific support measures for innovation. Namely, the EUSBSR does that primarily through PA Innovation, where Baltic TRAM is affiliated with the PA Innovation flagship (Baltic) **Science Link**. In Baltic TRAM’s specific case, the cross-cutting macro-regional cooperation approach is being furthered (European Commission, 2016a, p. 12), since, the project’s innovation initiatives are complemented and discussed in cooperation with the EUSBSR PA **Education** flagship **Baltic Science Network** and **HA Neighbours**. For example, Baltic TRAM has supported Baltic Science Network’s activities through engaging in its national workshops, as well as the Network’s BSR-wide survey of researchers and academics (Baltic Science Network, 2016; Šime, 2017). Further dialogue between the outlined EUSBSR strands, as well as CBSS and Barents Euro-Arctic Council (BEAC) research and innovation initiatives, was elaborated during discussions of the first **CBSS conference Baltic Sea Science Day** on 8 February 2017 in St Petersburg, Russia (CBSS, 2016b). It should be pointed out right away that the major value added of the Baltic Sea Science Day was to gather not only representatives from renowned science and research institutions, but also various European (e.g. DG RTD) and transnational science, research and innovation facilitators and coordinators to provide a thought-provoking comprehensive landscape for wider audiences. Therefore, one of the unique angles of the CBSS conference Baltic Sea Science Day is that this event contributed to further enhancing the embeddedness of the relatively recently implemented macro-regional approach in the long-standing multi-lateral dialogue and the more than two decades’ long cooperation tradition organised under the helm of Regional Councils.

The core document stating the EUSBSR PA Innovation governance and implementation approach is the **“Strategy Guide: Putting the Action Plan into Practice”** (Nordic Council of Ministers Secretariat, 2016). One of the notable features of this document is that it strengthens the inclusive character of the EUSBSR external dimension. Namely, the Guide was reviewed by the PA Innovation Steering Committee, a grouping which encompasses, speaking in the **European Innovation Scorecard’s** terminology, also such enduring **Strong Innovators** (Hollanders & Es-Sadki, 2017, p. 26) and the CBSS Member States as Iceland and Norway.

Baltic TRAM addresses a number of issues discussed in the Strategy Guide. Most notably, Baltic TRAM helps to bring smart specialisation to the macro-regional or transnational level (Nordic Council of Ministers Secretariat, 2016b, p. 13) in order to contribute to the mid-term evaluation planned in spring 2018 (Nordic Council of Ministers Secretariat, 2016a, p. 8). One reason why it is important to note Baltic TRAM’s contribution to the upcoming mid-term evaluation of EUSBSR PA Innovation performance, is due to the acknowledgement of experienced macro-regional experts that best practices and solutions developed in one macro-regional area could be transferable to another area (Jerina, 2016, p. 20). Therefore, the EUSBSR PA Innovation flagships and their affiliated projects serve as test-beds where transnational best practices are moulded for closer science-business cooperation supporting

innovation-driven growth and, thus, producing solutions potentially applicable also to EUSDR, **EU Strategy for the Adriatic-Ionian Region (EUSAIR)**, EUSALP and relevant to the ongoing work of **EUSALP Action Groups** towards the identification process of **EUSALP lighthouses**.

Likewise, Baltic TRAM embodies the acknowledged value of a macro-regional approach in spurring closer ties with non-EU countries (European Commission, 2016d, p. 3). This report advances such commitment, firstly, by offering CBSS-wide reflections on science and innovation developments. Secondly, this report takes a stock of vibrant discussions involving PA Innovation, PA Education and HA Neighbours in a BSR-wide debate organised during the first CBSS Baltic Sea Science Day on 8 February 2017 in St Petersburg, Russia.

To conclude with a forward-looking note on other macroregional strategies, the EUSALP considers the ongoing work of EUSBSR, EUSDR and EUSAIR as an inspiration to advance its research and innovation agenda in the framework of an **Alpine Innovation and Research Strategy** (European Commission, 2015a, p. 11). For example, EUSBSR PA Innovation flagship Baltic Science Link supports activities in EUSALP via knowledge transfer and common activities. It is a work in progress, thus at this stage it remains challenging to elaborate on the innovation governance in the EUSALP setting in greater detail.

Baltic TRAM, as a project closely aligned with the EUSBSR developments, through this report also proves itself to be eager to stay up-to-date regarding the latest developments of similar initiatives in other macro-regional settings. Namely, Baltic TRAM takes into consideration that EUSDR was mentioned among the two strategies which serve as catalysers for economic development through innovation (Uyarra, Sörvik, & Midtkandal, 2014, p. 9). During the “horizon scan” organised for this report, Baltic TRAM traced commonalities between EUSBSR PA Innovation supported cooperation with such EUSDR initiative as the **Danube Innovation Partnership** (European Commission, 2017, p. 44). This report demonstrates the good-will to engage in a more nuanced debate in the future.

4. Transnational Governance Level: Four Councils of the North

As a grouping of transnational governance forums; the Arctic Council, the Barents Euro-Arctic Council, the Council of the Baltic Sea States (CBSS) and Nordic Council of Ministers (NCM) meet annually to share their experiences and present best practices in a number of fields, research and innovation being one of them. In order to provide wider audiences with a more thorough insight what are the commonalities and differences between the research and innovation agendas of all four councils, the next chapters present a concise overview of the latest activities and cooperation structures supported by each council.

4.1. Arctic Council

4.1.1. Major events

The last two years have been dynamic in terms of enhancing the Arctic region-wide dialogue on science cooperation and developing further the existing framework for such cooperation. One facilitator for science cooperation among the Member States of the Arctic Council is the recently concluded **Agreement on Enhancing International Arctic Scientific Cooperation** signed at the Fairbanks Ministerial meeting on 11 May 2017 (Arctic Council, 2017a). As Article 2 of the legally binding document states, “the purpose of the Agreement is to enhance the cooperation in Scientific Activities in order to increase effectiveness and efficiency in the development of scientific knowledge about the Arctic” (Arctic Council, 2017, p. 2). The agreement will “help to facilitate entry and exit of persons, equipment, and material; access to research infrastructure and facilities; access to research areas; the use of traditional and local knowledge; and education, career development, and training opportunities for students and early-career scientists” (Arctic Council, 2017b). Thus, the document serves as an enabler of practical activities for enhancing scientific knowledge on the Arctic.

The seminal event was the **White House Arctic Science Ministerial** held on 28 September 2016 in Washington, DC. Nevertheless, it should be pointed out that this event was “headed by the US President’s science advisor Dr John Holdren, and thus outside the general Arctic Council meeting agenda”. “In total, 22 countries participated (the 8 Arctic countries, the 12 observer states to the Arctic Council, Switzerland and New Zealand) as well as the European Union” (Stephen, 2016). The fact that the meeting was attended by an expanded forum of countries testifies to the global resonance and topicality of Arctic developments. The high-level meeting served to outline the importance of “increasing the scientific and public understanding of the region”, as well as to present the vision of enhanced science cooperation being beneficial also to the innovation and sustainable development in the region (Arctic Council, 2016).

However, the White House Arctic Science Ministerial didn’t turn a totally new page in the regional cooperation, since the Arctic Council has been operating a range of means for coordinating cooperation amongst the Arctic States, for example, monitoring and assessment programs, for a number of years.

The six Working Groups (WGs) of the Arctic Council are running a significant number of programs and projects that are based on active participation from a large number of scientists from all Arctic states, as well as **Observers** to the Arctic Council. In more recent years the Arctic Council has also established two types of subsidiary bodies – Task Forces and Expert Groups. **Task Forces** develop recommendations on policy making on matters of particular importance for the overall aims of the Arctic Council cooperation. As a general rule, these Task Forces usually have a mandate to conclude their work between Ministerial meetings. In more specific terms, currently, there are two task forces in operation, while eight task forces have concluded their work, one among them, namely, the **Task Force**

for **Enhancing Scientific Cooperation in the Arctic** (SCTF) was established in 2013 well ahead of the White House Arctic Science Ministerial (Arctic Council Secretariat, 2017).

WGs oversee a range of assessment and monitoring programs which coordinate networks of scientists, government agencies, indigenous organisations, conservation groups and non-governmental organisations, working together to harmonise and integrate efforts to monitor and assess the status of the Arctic environment and its living resources. This is done through comprehensive assessments on climate, pollution and biodiversity issues; such as the **Arctic Monitoring and Assessment Programmes Trend and Effects Monitoring Programme** (ATEMP) and the **Assessment Program on Snow, Water, Ice and Permafrost in the Arctic** (SWIPA), and the **Circumpolar Biodiversity Monitoring Program** (CBMP).

The **International Arctic Science Committee** (IASC) works closely with the Arctic Council to foster a greater scientific understanding of the Arctic region and its role in the Earth's system. Additionally, many universities, colleges and research institutes are members of the **University of the Arctic** (UArctic), a cooperative network focused on education and research of the Northern areas. UArctic is an Observer of the Arctic Council, so cooperation and communication between the UArctic and the Arctic Council is mutual and continuous. For example, the Finnish Chairmanship 2017 – 2019 of the Arctic Council in partnership with UArctic aims “to strengthen the network of education specialists in cooperation” (Finnish Chairmanship, 2017, p. 3).

4.1.2. Enduring cooperation structures

The Arctic Council operates on a two-year cycle centred around Arctic Council Ministerial meetings, which serves to issue political guidance enshrined in declarations and approve WGs workplans, that structure the work of the Council for the following two-years. The **Senior Arctic Officials** (SAOs) and **Permanent Participants** (PPs) of the Arctic Council meet a couple of times per year to receive progress reports on the work of the WGs and plan the near-term and long-term direction of the Council in line with the decisions and guidance provided by the Foreign Ministers of the Member States.

Several of the Council's activities extend beyond the two-year cycle, since they are of a long-term nature and focused on such tasks as the monitoring of Arctic environment and ecosystems to detect any changes and facilitate development of appropriate responses. **Arctic Marine Strategic Plan 2015-2025** serves as one of examples for long-term programmes. Some of these strategic plans entail an evaluation component, which is incorporated for the sake of achieving greater impact and better response to the addressed challenges. One example, is the **Actions for Arctic Biodiversity 2013-2020: Implementing the recommendations of the Arctic Biodiversity Assessment**. Furthermore, the Fairbanks Ministerial 2017 paved the way for developing a long-term strategic plan, which would be finalised by the end of the Finnish Chairmanship 2017 – 2019.

As it is illustrated by a number of examples set out above, throughout its history, the Arctic Council has emphasised research and science cooperation as the primary basis for decision-making in the Council. The Council's notable list of assessments testifies to the ability of identifying a broad range of gaps in knowledge, research and monitoring which are further addressed by appropriate measures of improved cooperation, such as enhanced data-sharing, once the proposed solutions have received the Ministerial approval. The combination of three types of policy documents – 2-year workplans; ministerial declarations; long-term programmes – ensure practical implementation of the political guidance, as well as ensures sound evaluation of the implemented measures.

4.1.3. Links with transnational and other level cooperation initiatives and frameworks

The Foreign Ministers of the Arctic Council have not only continuously encouraged national continuation of cooperation initiatives and frameworks, but also guided the WGs to expand their efforts in identifying new viable solutions for regional and global challenges. Consequently, the WGs also explore and support synergies through cooperation and communication with relevant forums beyond the Arctic Council. Annual consultations of the Four Regional Councils of the North serve as one of the most telling examples.

WGs have a framework of agreements designed to facilitate cooperation at different scales and geographical areas. These resolutions of cooperation guide partnerships, ensure that information on Arctic biodiversity are communicated to the relevant subject matter forums, such as international environmental organisations and global geographic data-portals.

WGs also pride themselves with a range of international networks of scientists, government agencies, indigenous organisations and conservation groups working together to harmonise their efforts related to monitoring, assessing and understanding the Arctic. These networks have broad engagement from Arctic states, non-Arctic states and international organisations and networks, for example, the **Circumpolar Biodiversity Monitoring Program**, as well as monitoring and assessment work on climate and adaptation (ocean and cryosphere; ocean acidification; adaptation and resilience) and pollution issues (persistent organic pollutants, mercury and short-lived climate pollutants).

The EU guidance does not play a crucial role in structuring the science-business cooperation in the Arctic setting. There are no initiatives or clusters existing in the Arctic which would be specifically tailored according to the EU's understanding of cluster role in smart specialisation. Likewise, the Arctic Council's science, research and innovation initiatives have not been aligned with the goals agreed on the European level, because the majority of the Member States are not members of the EU. However, the Member States might have own national initiatives on Arctic issues that are aligned with the goals agreed on the European level.

Once taking a closer look at the global context, the Arctic Council as a forum with a notable international outreach, takes into account globally agreed goals and targets in the development of regional initiatives intended to support their implementation. Namely, during the Finnish Chairmanship 2017 – 2019, the Arctic Council explores how the framework of the **UN SDGs** is addressed in the Arctic cooperation for the benefit of humans and nature (Finnish Chairmanship, 2017, p. 1). Good grounds for a more nuanced look on the role of SDGs is laid out by previous chairmanships. For example, the project **Improving Health through Safe and Affordable Access to Household Running Water and Sewer (WASH)** (Askholm Larsen, 2016), implemented during the US Chairmanship 2015 – 2017, supported the implementation of UN SDG 6 “Clean Water and Sanitation”. Another example is the **Arctic Migratory Bird Initiative (AMBI)** which is designed to improve the status and secure the long-term sustainability of declining Arctic breeding migratory bird populations. The goals of AMBI relate to the SDGs and the Aichi Targets.

One example of the upcoming events is the **2nd Arctic Biodiversity Congress** which, will be taking place on 9 – 11 October 2018. The congress will be dedicated to a discussion on the role of the Convention on Biological Diversity, the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets, as well as the SDGs in the Arctic setting.

Work on addressing contaminants and corresponding human health issues support further development and implementation of the **UNEP Stockholm Convention on Persistent Organic**

Pollutants and Minamata Convention on Mercury, and work on climate, ocean acidification and adaptation connected to the **UN Framework Convention on Climate Change (UNFCCC) / Intergovernmental Panel on Climate Change (IPCC)** and the **2015 Paris Agreement**. Main activities on mercury relate to joint work with UNEP relevant to the Minamata Convention on Mercury and the upcoming **Global Mercury Assessment 2018**. A major focus of the Arctic Council work on climate issues is to contribute to the planned IPCC special reports and the **6th Assessment Report** (also known by the abbreviation **AR6**). Another important activity of the Arctic Council is the implementation of its **Framework for Action on enhanced Black Carbon and Methane** emission reductions.

Therefore, to sum up the Arctic Council also illustrates a vivid example of joint efforts aimed at strengthening the implementation of globally-set goals both in terms of comprehensive frameworks, such as, the Agenda 2030, as well as subject specific agreements, such as the earlier discussed UN Conventions.

4.2. Barents Euro-Arctic Council

In June 2013, Barents Euro-Arctic Council (BEAC) celebrated its 20th anniversary. This occasion served also to highlight the role of research and science cooperation in the region. Namely, the **Declaration on the 20th Anniversary of the Barents Euro-Arctic Cooperation** states the aspirations of the Barents region to become a model region for the rest of Europe in terms of innovation and sustainable development (BEAC, 2013, p. 2). BEAC has laid sound grounds for such ambitions by facilitating a varied cooperation between education and research institutions (BEAC, 2013, p. 4). Further support was expressed in order to establish joint education and research programmes, outlining the **Barents Summer School** (also known as **PhD Barents School**) as an example (BEAC, 2013, p. 5). The major forum in the BEAC for science and education cooperation is the **Joint Working Group on Education and Research (JWGER)**, which is co-chaired by the Northern (Arctic) Federal University (NARFU) and Lapland University (Rovaniemi, Finland). The “creation of a common educational space in the Barents region and further development of internationalisation in the area of higher education and research has been recognised by the WG members as a priority task” (BEAC, 2017, p. 1). The activities organised under the JWGER are multi-faceted and encompass a considerable number of items:

- promoting education and research as the tools for regional and economic development;
- consolidating efforts for research-based education and interdisciplinary dialogue in fundamental and applied research;
- enhancing the quality of education and training in the region;
- promoting joint academic programs and training courses;
- using e-learning as an effective instrument of academic interaction among the actors, supporting academic mobility programs;
- providing debating arenas (forums on education and research);
- supporting the establishment and the work of educational consortia and networks;
- encouraging partnerships with other actors of the Barents cooperation, including regional authorities, industries, NGOs and sharing the experience as well as disseminate information about successful international projects in the field of education and research.

The three priorities of JWGER are, firstly, to strengthen the JWGER membership and streamline its strategic approach according to the new challenges and needs of the Barents area. Secondly, the JWGER contributes to the implementation of regional strategies, such as domain-specific strategies dedicated

to the climate change and transport. Thirdly, the JWGER ensures the cross-cutting relevance of its activities by closely cooperating with other BEAC Working Groups, as well as maps out synergies with the relevant Northern networks, such as the European Union's Northern Dimension partnerships, the UArctic, the Arctic Council's Working Groups and Task Forces.

The practical implementation of these priorities is facilitated by joint projects within the **Kolarctic European Neighbourhood and Partnership Instrument (ENPI) Cross-Border Cooperation (CBC) Programme 2009-2014**, Internationalisation as a Resource of Barents Region Development (UiN – NArFU), and the BEAC Communication Development Project.

Projects coordinated in other BEAC Working Groups also contribute to further advancement of JWGER priorities. Namely, such projects as the **Finnish-Russian Arctic Mining Initiative** carried out under the Finnish Chairmanship of the BEAC **Working Group on Economic Cooperation** as part of the Finnish Green Mining Programme for 2011 – 2016, which serve as good examples of creating closer research and business sector ties. "The project identified key needs for research and innovation activities concerning the mines in the North-Western Russia" (BEAC, 2015, pp. 1-2). The project was designed in order to create sub-clusters of companies, research organisations and other relevant actors which would ensure regionally tailored high-quality services to the local customers.

Furthermore, the main tasks of JWGER for 2016 – 2017 are feeding into the implementation of **the Joint Barents Transport Plan**, drafting of the **Action Plan on Research and Education**, promotion of Barents Region as an attractive study destination, **Arctic Studies Summer School** and joint applications to the Kolarctic Cross-Border Cooperation Programme 2016-2020 (Ivanov, 2017, p. 17).

4.3. Council of the Baltic Sea States

On 13 September 2007, the third high level meeting of representatives from the Ministries of Education and Science from the CBSS Member States was held in Riga, Latvia, which resulted in joint position how to advance in future CBSS cooperation in higher education and science domains. It is outlined in the **2007 Latvian CBSS Chair's Conclusions "Higher Education and Science for Sustainable Development and Competitiveness of the Baltic Sea Region"**. This document marked the path towards facilitated cooperation in innovation with a reference to its relevance in the drafting of the EUSBSR. Therefore, from the very beginning of the macro-regional discussions CBSS demonstrated its commitment to advance innovation governance along the efforts in facilitating BSR-wide education, research and development cooperation (CBSS, 2007, p. 1). The document also testifies to the comprehensive thinking on education, research and innovation, encouraging higher education institutions to serve as models of sustainable development (CBSS, 2007, p. 2).

Almost a decade later during the 2016 Ministerial meeting in Kraków, Poland, these intentions were solidified by outlining two specific Interreg Vb BSR Programme funded projects – Baltic TRAM and Baltic Science Network – as the cornerstones of the **CBSS Science, Research & Innovation Agenda** (CBSS, 2016f). Both projects are connected to the EUSBSR, thus through facilitated inter-governmental dialogue on these projects as well as active engagement in the project implementation phase, CBSS serves as a key support structure in making the EUSBSR an exemplary model of macro-regional governance.

The 2007 Latvian CBSS Chair's Conclusions set out an intention to establish and an **ad-hoc Task Force on Science Infrastructure in the BSR** (CBSS, 2007, p. 1). Consequently, Baltic TRAM High Level Group, which assembles national managing authorities responsible for science and innovation policies, as well as distinguished experts of analytical facilities, demonstrates this commitment in specific actions. The first meeting of the Baltic TRAM High Level Group was held on 27 October 2016 in Hamburg, Germany, where the drafting of this report was the main discussion item (CBSS, 2016e). Thus, this report serves as the most visible example of Baltic TRAM High Level Group's work and contribution in advancing the transnational thinking on the best support measures for enhanced science-business cooperation. Likewise, the Baltic TRAM Evaluation Committee responsible for reviewing the applications submitted during the Baltic TRAM open call for EU-based businesses serves as another example of transnational coordination.

Further guidance for the advancement of the CBSS Science, Research & Innovation Agenda in line with the CBSS long-term priorities was provided at the end of 2016 by the CBSS Director General Ambassador Maira Mora in her statement "Celebrating Research and Innovation Across the Baltic Sea Region Ahead of the **World Science Day for Peace and Development 2016**", stating that "through the Regional Identity lens, the CBSS supported Baltic Science Network is contributing to strengthening neighborliness, since it is addressing mobility and networking shortfalls currently faced by the BSR in science and research domains spanning beyond the EU area. Through the Sustainable and Prosperous Region lens, the CBSS supported Baltic TRAM [...] addresses the aspirations of BSR states to remain in the European leadership positions in terms of innovation performance, thus sustaining the welfare of nations inhabiting the region" (CBSS, 2016c). Implementation of these two cornerstone projects remains the driving force for the initial implementation phase of the CBSS Science, Research and Innovation Agenda.

Nevertheless, these are not the only components to the discussed Agenda. The UN observance **International Day of Women and Girls in Science** served as the supportive occasion for the CBSS Icelandic Presidency's 2016 – 2017 priority "equality". The International Day of Women and Girls in Science 2017 was celebrated by the CBSS on the occasion of the first **CBSS Baltic Sea Science Day** on 8 February 2017 in St Petersburg, Russia.

Bearing in mind the 2007 and 2016 CBSS high-level guidance dedicated to the implementation of the BSR-wide cooperation in research and innovation in alignment with the SDGs, CBSS Science, Research & Innovation Agenda is shaped in line with the previous work dedicated to the particularities of implementation and priorities set on the national level regarding the SDGs in the BSR countries as analysed in the CBSS report "**Assessing the Status of Sustainable Development in the Baltic Sea Region: A Macro-Regional Perspective**" commissioned by the **CBSS Expert Group on Sustainable Development – Baltic 2030** (CBSS, 2016d). Furthermore, the CBSS Science, Research & Innovation Agenda through Baltic TRAM contributes to the implementation of **Baltic 2030 Action Plan** which, on 20 June 2017, "was endorsed by the Ministers of Foreign Affairs of the Baltic Sea Region and a representative of the EU at the Ministerial by the adoption of the CBSS 25th Anniversary's **Reykjavik Declaration**" (CBSS Secretariat, 2017a). Moreover, Baltic TRAM itself serves as a transnational microcosm mirroring how SDGs are translated into practical steps with policy-shaping potential. Namely, Baltic TRAM embodies:

- **SDG 5 "Gender Equality"**, since the ratio of women in the science field is bias towards men, in the project most Work Packages are led by women.

- **SDG 9** “Industry, Innovation and Infrastructure”, which is the core SDG for Baltic TRAM’s work, since Baltic TRAM’s partnership recognises the importance of the global target 9.5 related to the enhancement of research, upgrade of technological capabilities of industrial sectors.
- **SDG 10** “Reduced Inequalities”, which in its essence holds relevance to the Baltic TRAM’s aspirations to bridge the innovation gap existing in the BSR, as well as help to address the research infrastructure gaps existing across the EU. In particular, Baltic TRAM notes the **European Action for Sustainability** (European Commission, 2016b, 2016c), since it reveals the important role smart specialisation plays in addressing this challenge in the BSR and EU-wide.
- **SDG 11** “Sustainable Cities and Communities”, which is important for Baltic TRAM due to the focus of the European Action for Sustainability on advancing the **European Innovation Partnership on Smart Cities and Communities**. Consequently, Baltic TRAM has informed the European Innovation Partnership on Smart Cities and Communities regarding its open call for EU-based companies offering free access to state-of-the-art analytical research facilities across the BSR, including also the provision of technical and scientific expertise to help solve challenges associated with developing new products or services.
- **SDG 17** “Partnerships for the Goals”, since Baltic TRAM’s core aim is to enhance science-business cooperation in order to sustain the outstanding macro-region’s innovation track record showcased in the **European Innovation Scoreboards** of 2016 and 2017 (Hollanders & Es-Sadki, 2017; Hollanders, Es-Sadki, & Kanerva, 2016). Likewise, since last year Baltic TRAM was endorsed as one of the two pivotal research projects during the first CBSS Science Ministerial and among its associated organisations is the **Baltic Sea Parliamentary Conference**, it further strengthens the European Action for Sustainability with its contribution to enhancing the partnership between EU, governments and private sector.

This short outline of Baltic TRAM’s current contribution to the implementation of Agenda 2030 global and European frameworks should be further complemented by a note that Baltic TRAM also serves as an example bringing to life one of the six priority focus areas of Baltic 2030 Action Plan themed “**Transition to sustainable economy**”. Last but not least, Baltic TRAM’s appreciation of SDGs and earlier addressed global, European and transnational implementation frameworks of Agenda 2030 is related to the potential of future Baltic TRAM activities to showcase support also to other SDGs depending on the nature of analytical services requested by the interested EU-based businesses and accepted for procession by the Baltic TRAM network.

All in all, the CBSS decade-long mandate to advance BSR-wide science cooperation related to analytical facilities has experienced a major boost by the endorsement of Baltic TRAM. The project has served as one of the driving forces in creating a closer and more structured transnational dialogue between managing authorities and analytical facilities across the BSR with a strong focus on business sector. The Baltic TRAM partnership has sparked also broader reflections across the CBSS on the topicalities of science-business cooperation, thus resonating in the macro-regional and European setting.

4.4. Nordic Council of Ministers

The vision of Nordic co-operation in research is documented in the **Cooperation Programme of NCM for Education and Research effective from 2015** (NCM, 2015). It is based on the rationale that co-operation gives research stakeholders and countries added value through cost savings and greater ability to attract research funding within EU programmes and initiatives.

In order to further its outreach in the science and innovation area beyond the geographical area of its Member States, NCM has taken up the **EUSBSR PA Coordinator's role for PA Innovation**. Thus, the NCM is working closely with the coordinators from the Estonian Ministry of Economic Affairs and Communications and the Polish Ministry of Science and Higher Education.

The NCM is also responsible for one of the flagships within the EUSBSR PA Innovation, named **BSR Stars**. The BSR Stars Programme is established to identify, develop and initiate demand driven transnational collaborations within the field of applied research and innovation. BSR Stars is funded, in addition to NCM Secretariat, by Norway, Iceland, Denmark, Sweden and Finland, beside in-kind contribution by Lithuania, Latvia and Estonia. To outline the cross-cutting ties, it should be pointed out that **BSR Stars S3** is also a close partner to Baltic TRAM, since the project was presented and discussed during the **Baltic TRAM Opening Conference** (CBSS, 2016a; DESY, 2016). Therefore, Baltic TRAM Opening Conference serves as an example of mutual learning among the EUSBSR affiliated projects.

Furthermore, BSR Stars assists the Secretary General's Office at the NCM to ensure that Nordic-Baltic innovation projects are provided with features contributing to the implementation of the EUSBSR. BSR Stars also receive the support of in-kind resources from the Baltic States' innovation agencies based at the Baltic States' NCM offices. This helps in providing a structure that aims at contributing to the implementation of the EUSBSR.

In stakeholder meetings between PA Innovation and its flagships, there has been a clear expression of the challenges in creating viable collaboration structures. This has been discussed with the network of ERDF managing authorities and PA Innovation has been selected as a pilot PA for examining challenges with the financing structure. The ambition of the network of ERDF managing authorities is to provide alternative funding opportunities for transnational collaboration within the BSR by applying Art. 70 in Common Provision Regulation for the implementation of the EUSBSR. Art. 70 allows up to 15% of programme funds to be used outside the eligible programme area but to the benefit of the eligible programme area.

Coming back to the NCM-funded research schemes, **NordForsk** should be mentioned. It is a platform for joint Nordic research and research infrastructure cooperation established by the NCM in 2005. The overall aim is to pool national research efforts to tackle common societal challenges in the Nordic region and beyond. NordForsk is governed by a board of high-level representatives from research financiers in Denmark, Finland, Iceland, Norway and Sweden, as well as the Nordic University Association and observers from the NCM, the Faroe Islands, Greenland and the Åland Islands.

The contributions of clusters and cluster policies to S3s are in part developed within **Innovation Express**, which is part of the BSR Stars flagship programme. The NCM funds the coordination and the matchmaking conferences within Innovation Express. The Lead Partner is the Danish Agency for Institutions and Educational Grants. On an annual basis, funding partners (currently Denmark, Iceland, Lithuania, Norway, Sweden, the Region of Catalonia in Spain, and Region of Brandenburg in Germany) coordinate a call to initiate cluster-to-cluster collaboration. Additionally, Poland and the region of Baden

Württemberg are involved in organising annual Cluster-to-Cluster Matchmaking Conferences. The call aims to initiate cluster-to-cluster collaboration, financially supported by the different funding partners in the respective countries, and coordinated through the Innovation Express Coordination Team. The annual matchmaking conference is developed in close collaboration with Cluster Excellence Denmark and attracts around 250-300 participants from around 150-200 different clusters from all over Europe. It is the largest matchmaking conference for clusters in Europe. During 2016 the NCM has also initiated three smaller pilot initiatives to allow clusters of the Baltic States to obtain the opportunity to start direct collaboration with Nordic clusters. This includes, in addition to Lithuanian clusters, also Estonian and Latvian clusters.

The NCM has, in its role as PA Coordinator, actively worked to build up the capacity at a regional level to utilise the S3s and, especially, to improve the possibilities for SMEs internationalisation through smart specialisation. This is done both in Innovation Express, but also through BSR Stars S3, where NCM is a partner. BSR Stars S3 investigates conditions for effective cluster policies in implementation of S3s with a focus on the bio-/circular and digital economy fields.

The NCM is working to integrate the UN SDGs across all sectors and cross-sectorial themes, including that of innovation. Innovation is recognised as an important driver for achieving sustainable development. Therefore, the priorities of PA Innovation are well placed to contribute to the SDG 9 “Industry, Innovation and Infrastructure”, specifically to its targets 9.3, 9.4 and 9.5.

4.5. Comparison of the Research and Innovation Cooperation of the Four Councils of the North

To start with a comparative note on inclusiveness of the collaboration structures, the Arctic Council excels in terms of the high level of structured engagement of its Observers in specific collaboration structures. Due to the fact that this report does not go into very nuanced comparative details of specific working bodies of each council, this reflection is left at this stage with a rather general remark.

As it is elaborated in the previous subsections, over the last years the Four Regional Councils of the North have benefited from a vibrant research and innovation cooperation. The Arctic Council, BEAC and CBSS have received an overarching high-level endorsement of their research and innovation strands which have been developed in close connection to the support for sustainable development.

Once taking a closer look at the latest global framework Agenda 2030 and how it is translated in specific actions in each geographic area, further references to SDGs give a more nuanced picture. The Arctic Council, CBSS and NCM share the commonality of having a focus on certain SDGs, although the concentration areas vary. If the Arctic Council in its previous projects has demonstrated support for the advancement of SDG 6 “Clean Water and Sanitation”, than CBSS and NCM focus on innovation is affiliated to the targets of SDG 9 “Industry, Innovation and Infrastructure”, where CBSS, as outlined the Baltic 2030 Action Plan, has endorsed a whole priority focus area “Transition to a sustainable economy” for a grouping in which SDG 9 is coupled with SDG 2, SDG 6, SDG 7, SDG 8, SDG 12 and SDG 14 (CBSS Secretariat, 2017, p. 12). CBSS through Baltic TRAM and NCM through Innovation Express share a common effort in strengthening the implementation of SDG 9 target 9.5. Consequently, this thread, due to the high involvement of both CBSS and NCM in the EUSBSR implementation, translates in the active engagement in transnational support for smart specialisation. Although BEAC is also engaged in the

support of cluster development, it does not share similar affiliation of these activities to the EU understanding of smart specialisation.

Consequently, a multi-level channel can be detected where the global target 9.5 is furthered in the European setting through the European Action for Sustainability, where SDG 9 implementation is strengthened also through smart specialisation (European Commission, 2016c, p. 35). It further trickles down on the macro-regional or transnational level in the EUSBSR work primarily structured under PA Innovation guided by the PA Innovation Strategy Guide and CBSS Baltic 2030 Action Plan, which is supported by the CBSS Science, Research & Innovation Agenda.

Furthermore, the graph no. 3 demonstrates that the CBSS stands out as a unique forum which due to its strategic partnership ties also attaches importance to the international level thinking enshrined in the OECD latest publications. Namely, through the Baltic TRAM policy-analysis work led by the CBSS Secretariat, the international level thinking depicted in the **OECD Innovation Strategy 2015** is taken into consideration. At the moment, this framework does not have explicit references to the SDGs' implementation (OECD, 2016a, p. 4), but the political guidance has been in favour of highlighting the OECD innovation-related discussions to their relevance to the Agenda 2030 (OECD, 2016, pp. 3, 5). Therefore, graph no. 3 may serve as an inspiration for the national policy-makers gathered by OECD towards elaborating the relevance of OECD Innovation Strategy's paragraphs in the SDGs' context. Therefore, Baltic TRAM mirrors the CBSS interest in advancing its ties with OECD as a strategic partner in an area where over the years OECD has demonstrated a highly-appreciated expertise.

Graph no. 3: Multi-Level Policy Frameworks of SDG 9

Governance level	Policy framework	
Global	SDG 9 "Industry, Innovation and Infrastructure"	
International	OECD Innovation Strategy 2015 paragraphs 26, 30, 44, 45 & 47	
European	European Action for Sustainability SDG 9 section	
Transnational	EUSBSR PA Innovation Strategy Guide	CBSS Baltic 2030 Action Plan's priority focus area "Transition to a sustainable economy"

Last but not least, as the final comparative feature between the Four Regional Councils of the North, it should be noted that the Arctic Council goes beyond the SDGs implementation and stands out with its vibrant work dedicated to the UN Conventions such as the UN Stockholm Convention and UN Minamata Convention. While CBSS has recently started paying more attention to somewhat softer drivers of various global causes, namely, the UN observances related to science, since their spirit embodies the values supported by the CBSS long-term priorities.

Conclusion

Science, as in many cases in history outlined in the **science diplomacy** literature, leads the way in building closer bilateral and multilateral ties among countries in a setting where other policy domains do not necessarily provide promising environment to reach common grounds and mutual understanding (The Royal Society, 2010, p. 15). Indeed, how could it possibly be otherwise, since enhanced dialogue on frontier research, cutting edge science and innovative breakthroughs is the only way forward in successfully addressing the jointly faced Grand Challenges.

This report encapsulates a panoramic view of the various strands of science cooperation pursued on a number of multilateral forums. Moreover, it points out the niche profiling which is pursued by each of the discussed cooperation platforms, showcasing the value added of collaboration network. Once more with brief references to the comparative conclusions of the Four Regional Councils of the North, it can be clearly seen that each of these intergovernmental forums are unique in terms of their approach in tailoring the dialogue and cooperation related to research and science-business ties. The Arctic Council with its strong focus on bringing more awareness to the impact of climate change on the Arctic environment excels with its nuanced work dedicated to the Stockholm Convention and Minamata Convention. Whereas, CBSS with its focus on building trust based collaboration among its Member States, can be singled out as a unique forum paying attention to the science related UN observances with dedication to promote wider awareness about the commendable work, as well as achievements of the BSR in various research domains.

Baltic Sea Science Day serves as the best example of evolving domain specific dialogue between the Four Regional Councils of the North beyond its annual consultations. It offers space to explore domain specific solutions crafted by the working bodies of each council and reflect on their latest achievements with an aim to broaden the mutual learning of best practices.

Furthermore, CBSS and NCM strong ties to the EUSBSR present a unique combination of complementary efforts. Namely, all three forums along with their working bodies bring their strengths together in order to ensure that the BSR is well-prepared to jointly address the research and innovation cooperation needs not only of the specific geographical area, but also to the benefit of whole Europe. Namely, Baltic TRAM's core goal of bridging in a transnationally coordinated manner the existing gaps in science-business cooperation and its collaboration model would not have been so successfully crafted without having a solid predecessor, Baltic Science Link, which was supported by the EUSBSR structures as its flagship and has been recognised on the European level as a model case by being the finalist of RegioStars 2017 (European Commission, 2017c). Likewise, Baltic TRAM with its nuanced multi-level policy analysis developed by the CBSS Secretariat in this report brings new perspectives to the macro-regional thinking ahead of the Mid-Term Evaluation of the PA Inno Strategy Guide, especially in terms of presenting a strong SDGs' dimension, since Baltic TRAM's thinking is intrinsic to the Baltic 2030 Action Plan. In addition, Baltic TRAM emerges as a pioneer stepping beyond the well-known macro-regional boundaries. Namely, Baltic TRAM not only reinforces synergies between different EU policies and instruments being "anchored in the cohesion policy framework" (European Commission, 2016e), but also responds to the call for broader awareness building by reaching out beyond the so-called "usual suspects", or in other words, the existing pool of macro-regional stakeholders (European Commission, 2016a, p. 17). It is done not solely for the sake of the EUSBSR advancement but also to support the implementation of national commitments agreed in other notable innovation forums, such as the OECD and its GSF with specific suggestions for the SDGs' relevance in the context of the OECD Innovation Strategy 2015.

In addition, such a comprehensive approach also makes sense taking into consideration that already on the European level the understanding about applicability of smart specialisation is based on the previous findings and conclusions drawn by the OECD, as it can be read in the publications of the European Commission's Joint Research Centre (Uyarra et al., 2014). Therefore, in a nimble way Baltic TRAM ensures an unprecedented and in many respects transcendent 'institutional embedding'. Cohesion policy-wise, Baltic TRAM does not need to be cross-fertilised with other innovation activities, since it has sought after in a timely fashion its relevance and links to a notably wide spectrum of forums and stakeholders aspiring to bring forward innovation performance, science-business cooperation, public-private partnerships, as well as provide new impetus to science, research and development for the benefit and prosperity of BSR population.

Moreover, by exploring how Baltic TRAM contributes to the implementation of acknowledgements and goals of other relevant innovation forums, it advances the macro-regional aspirations to avoid duplication with existing structures, which was noted as an enduring pre-condition for new and emerging macro-regional activities (European Commission, 2016d, p. 9). Therefore, the report is of relevance not solely to the BSR audiences interested in the macro-regional governance, but also other macro-regional areas, namely, stakeholders of EUSDR, EUSALP and EUSAIR.

Furthermore, this report builds on the conclusions drawn from the national and regional level smart specialisation priority analysis, where the health sector, bio technologies, digital growth through focus on ICT, as well as sustainable energy production were identified as strongly represented among several BSR countries, thus serving as examples of transnational smart specialisation thematic areas (Mickus et al., 2017, p. 30). This report does not provide any specific notes on the relevance of these areas to Baltic TRAM's pursued science-business cooperation. Nevertheless, during the second half of the project the exciting exploration phase will be taking place in terms of finding out whether the science-business cooperation dynamics spurred by Baltic TRAM will mirror the policy-makers' crafted focus. Consequently, the multi-level governance grid offered in this report would be instrumental in further attempts to explain in case the exploration phase of Baltic TRAM's processed cases does not mirror exactly the same priorities as earlier identified widely supported smart specialisation thematic areas. Therefore, this report would be instrumental in bringing wider awareness regarding the potential gap in terms of the governance level thinking about thematic priority areas and the research-intense innovation dynamics demanded by the businesses. Yet again, Baltic TRAM as a project of a limited set of activities, does not aim to provide one and the only answer regarding the transnational potential and the most dynamic thematic areas of science-business cooperation in BSR and beyond it. Here a reference to the vibrant work structured within PA Innovation should be mentioned. However, Baltic TRAM findings will help the policy makers to get a better understanding of further opportunities how the transnational cooperation organised with an aim to advance research support for businesses could be moulded.

To highlight even more the topicality of Baltic TRAM's work, it should be noted in the context of the recent **European Commission's Communication "Strengthening Innovation in Europe's Regions: Strategies for Resilient, Inclusive and Sustainable Growth"**, which invites to establish collaborative governance models for absorbing new technologies, connecting to the local economy with world-class research and widening participation in global innovation networks (European Commission, 2017b, p. 9). Baltic TRAM serves as one of the examples of such a transnational partnership which aspires to design an enduring cooperation model for sustainable growth and competitiveness of businesses based into production of innovative products and services. All in all, this report serves as one of the core

building blocks towards drafting the recommendations for further advancement of science-business cooperation which will be undertaken by the Baltic TRAM High Level Group during the concluding phase of the project.



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