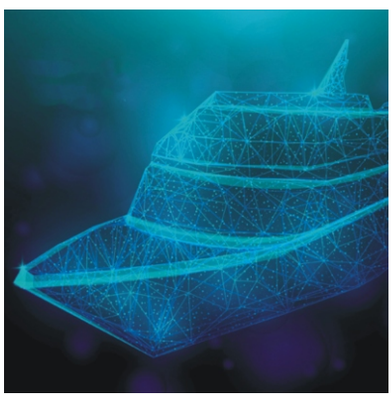
Baltic Science Network



The Baltic Sea Region
A Science Powerhouse

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP

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Baltic
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The Baltic Sea Region - A Science Powerhouse

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Science Powerhouse Report

The Baltic Science Network Project - an introduction

Who we are and why are we needed

The recently published FP9 proposal "Horizon Europe" strongly emphasises the relevance of research and innovation with a focus on supporting European excellence in research and innovation, European industrial competitiveness, and implementing the sustainable development goals in the EU in order to tackle global challenges. One of the key objectives that will be vital to the success of Horizon Europe is to unlock the innovation potential of research and the research infrastructures, both in scientific research and research-industry collaboration.

Ministries all over the EU have developed strategies for intensifying collaboration, including the shared use of large-scale research infrastructure, the exchange of researchers and early-career scientists, and joint participation in supra-regional, EU-wide competition. Certainly, having a strategy for one's own country is a good starting point however, how much more can be won, if neighbours join forces and collaborate especially in fields were transnational cooperation brings an added value? Wouldn't everyone benefit from joint efforts to align science policies rather than address the issues in isolation?

The macro-regional concept arose from a wish for a collective response to common societal challenges where national and regional answers are not considered sufficient anymore. However, the Baltic Sea Region (BSR) features different levels of research and innovation performance. Existing facilities are not equally distributed and interconnected. Countries in the region face similar problems in national higher education and research systems (globalisation, economic crises, demography, technological progress, etc.). At the same time, society expects research and innovation policy and R&D activities to respond to the challenges facing society at large, such as climate change, energy and resource efficiency, food supply, welfare, health and demographic change. To tackle common problems and exploit the full potential of research and innovation, the BSR countries should cooperate on a transnational level and jointly represent common interests at the EU level.

One of the most competitive, innovative science macro-regions in the world is the Baltic Sea Region. It is offering an excellent structure of leading universities and research institutions. So far, science policy in the BSR was organised and pursued mainly from a regional, national or European angle, a macro-regional dimension was missing in this field. Despite the fact that various sectorial networks exist, there was a lack of a political coordination framework in the field of higher education, science and research policy covering the whole BSR.

To fill this gap, we established the "Baltic Science Network" (BSN). BSN is a policy network gathering relevant transnational, national and regional policy actors from all BSR countries. The network is a springboard for targeted multilateral activities in the frame of research and innovation excellence, mobility of scientists and expanded participation. The platform is tailored to provide advice on how to enhance a macro-regional dimension in higher education, science and research cooperation. Recommendations jointly formulated by the Network members address the European, national and regional policy-making levels. BSN shows that the Baltic Sea Region has the potential to serve as a role model for other macro-regions and the EU as a whole. It allows to combine and utilise the strengths of the old Member States (EU-15) and the new Member States (EU-13) in order to foster research and innovation and bridge the innovation gap where necessary. BSN highlights the importance of transnational cooperation for developing a prosperous, knowledge-based European society ready to manage future challenges.

Today, nearly all science policy-relevant organisations from all states bordering the Baltic Sea, including Russia and Norway, are members of BSN. This includes ten regional or national science ministries, a major national research funding organisation, a science policy think tank, as well as the Council of the Baltic Sea States and the Nordic Council of Ministers.

The perspective of higher education institutions is represented in BSN through the two existing university networks Baltic University Programme (BUP) and Baltic Sea Region University Network (BSRUN), along with three universities explicitly nominated by their national governments. Also, BSN closely collaborates with related projects such as Baltic TRAM (Transnational Research Access in the Macroregion).

The EU perspective of BSN is reflected in the involvement of BONUS, a macro-regional research funding programme of the EU, and the EU Baltic Sea Strategy (EUSBSR), where BSN is a flagship of the Policy Area Education, Research and Employability. But also other policy fora, like the first Science Ministerial of the Council of the Baltic Sea States (CBSS) and the Baltic Sea Parliamentary Conference (BSPC) have recognised the value of BSN.

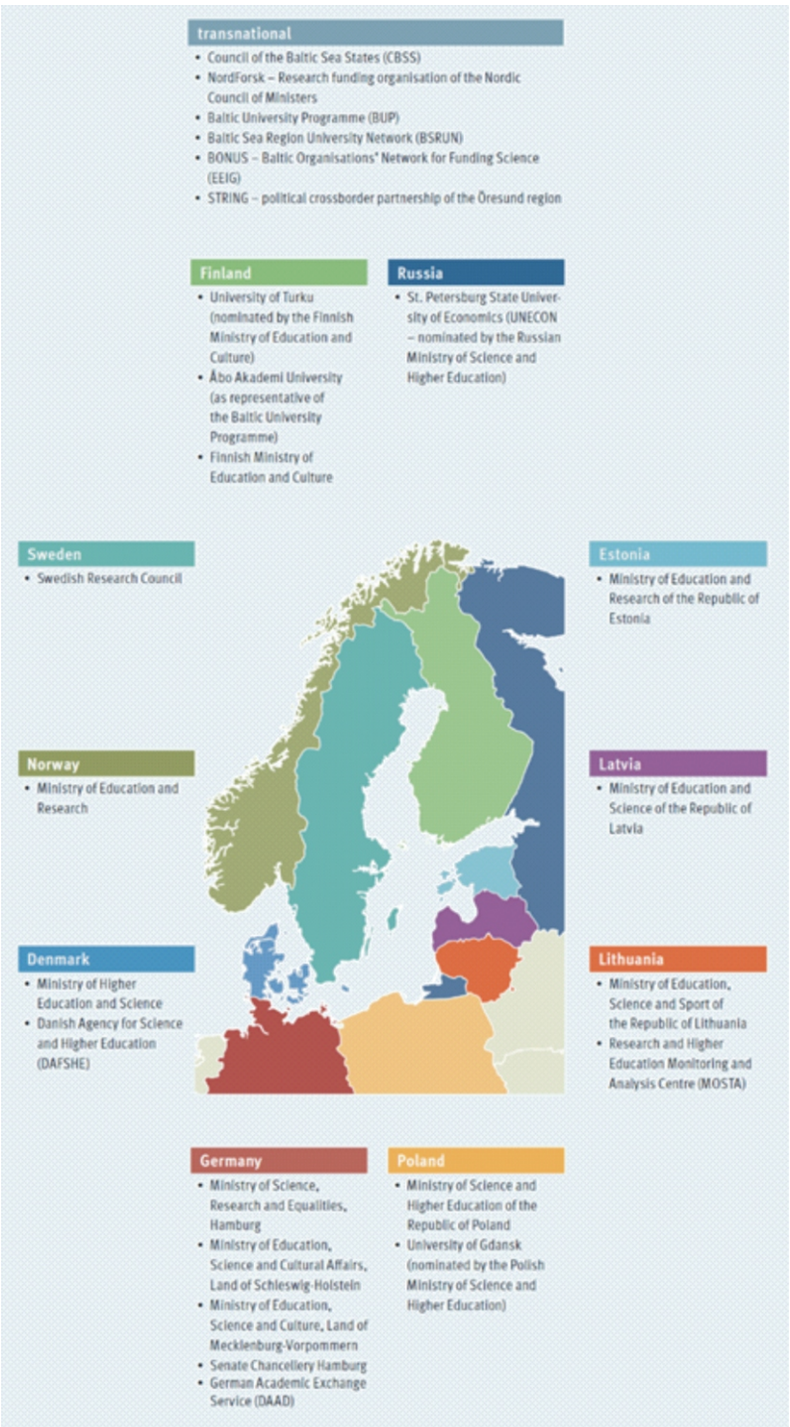


Fig.1: Members of BSN (source: wbv Media GmbH & Co. KG, Bielefeld)

How it all started

In 2016, the Baltic Science Network (BSN) was established as the first transnational forum for research policy in the Baltic Sea Region under the leadership of the Hamburg Ministry of Science, Research and Equalities.

At the outset, we had intensive brainstorming sessions, specifying how a macro-regional research perspective for the BSR could be shaped and what it could consist of. As a result, BSN decided to focus on five topics to be divided into the following Work Packages:

Within three years, new innovative concepts, tools and strategies for more intensive transnational science cooperation have been developed on these topics.

In the analysis phase, we carried out detailed studies and hosted regional, national, and transnational workshops to identify common problems and challenges in national higher education and research systems.

The results of this first phase built the basis for further proceeding: defining areas of joint interest and developing joint recommendations for strategies and research areas, mobility tools and tools for widening participation. We consistently arranged meetings and consultations with stakeholders from our partner countries to align our next steps with their needs. Good opportunities to communicate BSN's outcomes to relevant interested parties opened up at the Fehmarnbelt Days 2016 and 2018, the 7th and 8th Strategy Forum of the EUSBSR held and the CBSS Baltic Sea Science Days in St. Petersburg, Turku and Riga.

To increase the BSR visibility in the EU, we produced a policy paper on the upcoming EU framework programme (FP9 / Horizon Europe) and a position paper on tackling widening participation in research and innovation from the BSR perspective. In cooperation with the Baltic TRAM project we organised a high-level political conference in Brussels where we received important input on our work from experts at the EU level.

WP2: joint articulation of the science policy interests of the Baltic Sea macro-region,
WP3: research and innovation excellence,
WP4: academic and researcher mobility,
WP5: widening participation in the EU research funding programmes,
WP6: best practice learning.

Representatives of the EU Commission, higher education, research institutes, NGOs and development agencies shared their expertise and experience on developing transnational research collaboration, enhancing growth and economic development by strengthening connections between science and industry. The inputs provided during the discussions revealed that we are on the right track!

What we want

BSN aims to forge the geographic proximity of the Baltic Sea Region into closer academic relations, better framework conditions for more intensive Cooperation in research and higher education at a political level, and articulate BSR interests more clearly in Brussels.

WE WANT

- **To provide science and research policy actors of the Baltic Sea Region with an overall coordination framework to develop and implement science policy in a macro-regional dimension. This also ensures a better representation of macro-regional interests at the EU level.**
- **To develop transnational strategies, incentives and programmes to support higher education, research and innovation and to develop R&I excellence.**
- **To ensure equal opportunities for excellent research.**
  To attract best talents and increase mobility for a competitive ERA.
- **To enhance synergies of funding programmes for the BSR and expand existing research funding**
- **structures in the BSR.**
- **To introduce new ideas for "widening participation" in order to decrease the participation gap between EU-13 and EU-15 countries in the BSR.**

In the field of science, research development and innovation all BSR countries have one common objective: there should be close cooperation between countries in the long term. Therefore, we have laid the foundations for closer, more connected collaboration to achieve this common goal. To ensure effective strategy implementation and establish a common science policy for the BSR in focused areas, we count on further commitment of our partners.

Disclaimer

This document is based on current reflections among partners and stakeholders and findings of BSN working papers and studies on research cooperation, researchers' mobility and widening participation in the BSR. The views expressed in this paper do not necessarily correspond to, nor compete with, national positions or positions of organisations.

1. Scientific Excellence

1.1 Why does BSN focus on this topic?

Scientific research and innovation are generally regarded as the key drivers of socioeconomic progress and national competitiveness, as well as essential tools for addressing contemporary societal challenges. To enhance national prestige and development, many countries have implemented measures to promote excellent research in their national science systems. As the world is becoming ever more integrated, mutual ties between regional, national and international communities are strengthening. This also applies to macro-regions where cooperation is used as an instrument for mobilising growth potential and smart specialisation and reduce fragmentation and disparities between regions in the EU.

Despite the excellent structure of leading universities and research institutions in the region, the wide range of research and innovation infrastructures across the BSR are not equally distributed and interconnected, leading to different levels of innovation and research performance. To improve competitiveness of research and science in the BSR, closer cooperation as well as utilisation of synergies between national and regional research and innovation strategies is needed. Although representatives of research communities have identified several benefits of closer cooperation, the BSR still experiences a lack of cohesion, commitment and international attractiveness as a research region. This in turn impacts the possibilities to utilise the full research and innovation potential of the region for the benefit of the economies and societies around the Baltic Sea, and for Europe as a whole.

In this Work Package we sought solutions for joint fostering of research and innovation excellence in the BSR. Joint strategies were planned for development to support the Baltic Sea Region cooperation in order to raise the quality in specific scientific areas and thereby enhance the competitiveness and the common good. Activities in this Work Package were primarily aimed at

- Identifying current challenges in transnational science and research cooperation faced by research and innovation infrastructure users,
- identifying common areas of research excellence within the BSR,
- mapping out joint transnational strategies for 2-3 specific areas of scientific excellence,
- jointly developing incentives/ funding schemes for fostering transnational research and innovation uptake in the BSR (Joint Programming),
- designing measures for better transnational utilisation of existing/ planned R&I infrastructure,
- and developing Action Plans to support joint transnational goals on a national, regional, local level.

1.2 What have we done so far?

1.2.1 Which problems are we facing?

The Baltic Sea Region (BSR) is well suited for developing transregional cooperation, since it is the first macro-region with a transnational strategy approved by the European Council (EUSBSR). Parts of the region are relatively successful in terms of obtaining funding for transnational projects from the EU Framework Programmes. However, several challenges hamper further enhancement of research cooperation and acquisition of a more considerable support from the EU Framework Programmes. To identify these challenges and barriers to research cooperation in the BSR, input was gathered at workshops and surveys of researchers, research administrators, and policymakers on a regional, national and transnational level. [1]

KEY CHALLENGES

- **administrative burden**
- **lack of a concise overview of various funding programmes**
- **lack of strategic coordination on a national and macro-regional level.**

The selected key outcomes were that stakeholders who were interested in transnational cooperation had to face a considerable level of administrative burdens stemming from the project management requirements, a complex and confusing (national, transnational, European etc.) research funding landscape, and a lack of strategic coordination on a national and macro-regional level.

A more general, cross-cutting conclusion is that these challenges are not only relevant in a macro-regional context, but in a broader EU context, too.

To arouse political interest and ensure political commitment, BSR has worked out common strategies focusing on the added value of BSR cooperation.

The results, which also offered possible solutions for improving the situation, served as input and inspiration for subsequent BSN activities and possible BSN policy recommendations to decision makers on how to improve transnational research cooperation.

1 Josephine Them Parnas (2017), Challenges and barriers to research cooperation in the Baltic Sea Region (WP 3.1)

1.2.2 How could we solve them?

Scientific Excellence: Joint Potentials in the Baltic Sea Region

For the development of synergetic transnational science strategies in the Baltic Sea region, a further BSN study identified common areas of current or potential scientific excellence, examples of research infrastructure of supra-regional significance and best practice already established in scientific cooperation.[2] In this context the study investigated the existing research and innovation strategies of regions, national states and international organisations of the region and mapped highlights of the science landscape in the BSR, based on an analysis of existing and potential fields of excellent research as well as major instances of transnational science cooperation and infrastructure.

The selection process was guided by several decisive factors: Excellence is definitely the key criterion for transnational scientific cooperation within the BSR. Here, the main focus was on already existing top research facilities and their potential for interregional collaboration. The study identified five common areas of interests rooted in the geographic, socioeconomic, cultural and other distinct features of the BSR and joint policy objectives that also meet BSN's other basic long-term goals, i.e. Widening participation and increasing researcher mobility. As a result, three specific research areas have been selected as the most promising fields of joint scientific excellence within the BSR:

Photon and Neutron Science, Life Sciences (with a focus on biomedical research, biomedicines, imaging,diagnostics, and drug development), and Welfare State Studies. There will be no special focus on marine science as it is already explicitly addressed in the BONUS programme. In order to develop an Action Plan for implementing joint transnational strategies for respective scientific areas, BSN established three expert groups with members of the scientific community (researchers and RI representatives). The results provided the EU, ministries and RI infrastructures with suggestions for transnational cooperation in the defined areas of excellence.

Creating Unique and Sustainable Value Through Scientific Excellence in Photon and Neutron Science in the Baltic Sea Region

The BSR has a rich history of innovative science and scientific collaboration, especially in the field of Photon and Neutron Sciences. The existing strong research infrastructures (RI) attract excellent researchers from all over the world and make up the nucleus of innovative science and research.

The expert group formulated recommendations for better scientific cooperation and distinguished four dimensions which address three different levels of operation:[3]

- research infrastructures as institutions carrying out activities and profiting from the cooperation,
- policymakers and funding programmes on a national level to provide effective political and financial support,
- policymakers on a transnational and the EU level, ensuring that the EU legislation and funding is favourable for transnational cooperation.

2 Kazimierz Musiał, Tom Schumacher (2018), Scientific Excellence: Joint Potentials in the Baltic Sea Region an Explorative Study (WP 3.2)

3 Blanka Thees (2019), Creating Unique and Sustainable Value Through Scientific Excellence in Photon and Neutron Science in the Baltic Sea Region (WP 3.2)

Research infrastructure	National level	EU level
Improvement of cooperation between RI on both organisational and staff level		
○ map out the cooperation potential to exploit synergies, ○ integrate smaller-scale RI and institutes through special in-kind contributions (e.g. FinEstBeamS)	○ long-term funding commitments and research programmes ensuring reliable framework conditions, ○ set up national platforms for coordination of national RI users	○ common service structure to provide EU-13 scientists with information on EU funds applications, ○ promote EU-Russia cooperation (e.g. CREMLIN)
Multilateral funding schemes, joint programmes and projects		
○ encourage the installation of further joint research groups and joint professorships in the BSR, ○ pan-European consortia (E.g. LEAPS, LENS) to develop macro-regional cooperation initiatives	○ promote partnerships and bi- or multilateral collaboration frameworks (e.g. RÅC), ○ coordinate national funding programmes, (e.g. EU flagships, excellence initiatives), ○ national funding to integrate medium- and smaller-scale RI	○ special BSR twinning & teaming programmes for integration of EU-13, ○ incentives for BSR collaboration in funding calls (focus on widening participation), ○ better alignment of structural and research funds
C Mobility and development of scientific, technical and administrative personnel		
○ support (short- and long-term) mobility at all career levels for scientists, technicians, engineers and administrative staff		
○ training and education schools targeted for exchanges within the BSR (e.g. RACIRI, MATRAC)	○ mobility programmes with a regional focus on the BSR, ○ incentives for the return of the staff after the mobility programme to avoid brain drain	

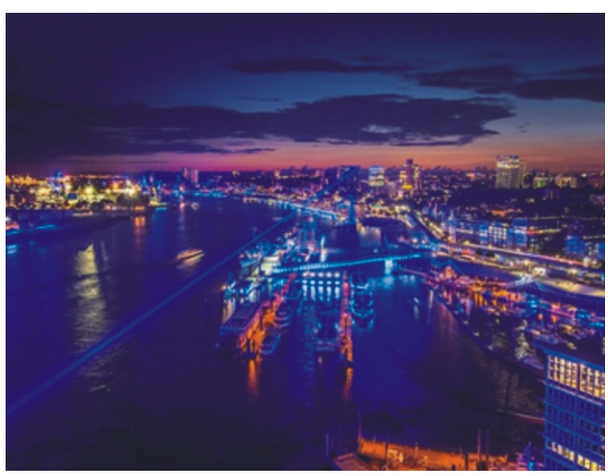
To strengthen the macro-region's position of a science and innovation powerhouse and tap into its yet undiscovered potential, BSN was advised to focus two exercises:

1. **BSN should foster a BSR Science Forum on Photon and Neutron Sciences with representatives from research institutions, science policy officials and industry.**

This **BSR Science Forum** should be mandated to devise a strategic roadmap process for the BSR area to explore in detail the science and innovation capabilities, the business needs and opportunities and the pathways to the future.

In the short run the **PNS support action** should focus on a better integration and connection of small-scale RI in EU-13 member states. These RI will act as dedicated partner facilities with complimentary services to major RI in the BSR, and advocacy for bi- and multilateral research cooperation projects connecting EU-13 and EU-15 research infrastructures.

2. **BSN is advised to develop a Photon and Neutron Science (PNS) support action for widening participation that will strengthen the research capacity and user community of EU-13 countries.**



Expert group on Life Sciences: Scientific Excellence in Life Sciences in the Baltic Sea Region

In a Europe consisting of strong regions, there is clear room for a BSR-focused platform on Life Sciences research. Looking at the region, one can easily identify several justifications for increased Life Sciences cooperation within the BSR. The region faces similar challenges in e.g. health and wellbeing that could gain from being tackled jointly by the countries and their research, development and innovation environments. The region also shares the same impacts of climate change, including new diseases in the region, and environmental hazards, such as the impact of pollutants present in the Baltic Sea. Opportunities to share knowledge and experiences are offered e.g. in the context of modernisation of hospitals in the region. Geographic proximity is also an asset when e.g. working with and storing biological samples, an essence for Life Sciences research.

The analysis made for this strategic paper suggests that the best **opportunities to harness the development of Life Sciences research through BSR cooperation** are found in building on existing cooperation structures and experiences, sharing unique resources, strengthening the networks, and fostering harmonisation in masters and doctoral training, public-private partnership (PPP) cooperation, and research practices.[4]

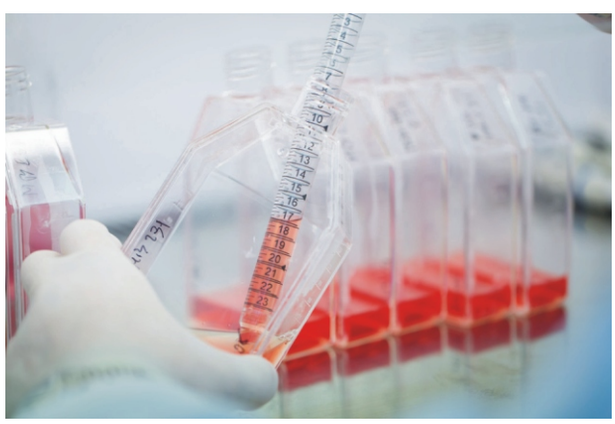
4 Jyrki Heino, Fredrik Björkling, Thomas Frahm, Toivo Maimets, Osvalds Pugovičs, Gintaras Valincius, and Krzysztof Bielawski (2018), Scientific Excellence in Life Sciences in the Baltic Sea Region (WP 3.2)

By developing a flexible model for macro-regional cooperation that utilises the opportunities offered by instruments on regional, national and the EU level, the proposed BSR cooperation in Life Sciences can also showcase good practices for the EU cooperation on a larger scale.

BSN should offer a platform for driving policy development in the BSR and coordinating the commitment of the research environment. Three priority areas have been identified, where the BSR cooperation in Life Sciences brings specifically added value to the quality and effectiveness of research and innovation:

- **Fostering innovations in Master and PhD studies** in Life Sciences to enhance the quality of Master and PhD studies. This is done by creating novel forms of international Master and PhD programmes that facilitate different forms of cooperation between universities, research institutes and businesses.
- **Providing world-class infrastructure for BSR researchers** in Life Sciences to ensure the most efficient use of existing infrastructure that benefits researchers in Life Sciences, through sharing, training and coordination.
- **Becoming the BSR world leader in Life Sciences industry** to ensure strengthened competitiveness of businesses through increased cooperation with public R&D organisations in the BSR.

For each priority area the experts outlined long-term and fast-track actions, including goals as well as responsibilities for policymakers, funders, research organisations, and industry partners. Parts of the suggested actions have been taken up in the Action Plans of BSN partners.



Expert group on Welfare State Research: Fostering Sustainable and Inclusive Labour Markets in the Baltic Sea Region: A Life Course Perspective

The BSN working paper of the Welfare State Expert Group "Fostering Sustainable and Inclusive Labour Markets in the Baltic Sea Region: A Life Course Perspective" presents challenges, analytical concepts and data sources, which are suggested for further consideration when designing BSN Action Plans for the support of scientific excellence in the Baltic Sea Region.[5] The added value of the highlighted data sources for welfare state research is inseparable from the responsibility of the states to guarantee a systematic collection and regular updating of these sources, as well as making them available for scientific collaboration. The first priority should be to ensure sufficient quality input for the existing EU level repositories and aim at exploiting the full potential of already established sources, rather than proposing the creation of new monitoring programmes.

5 Zane Šime (2018), Working Paper of the Welfare State Expert Group "Fostering Sustainable and Inclusive Labour Markets in the Baltic Sea Region: A Life Course Perspective" (WP 3.2)

Accessible and high-quality data are of essential importance for a successful implementation of forthcoming macro-regional research collaboration projects. The expert group suggests to focus on set of challenges, analytical concepts and data repositories which hold the most value for future welfare state research in the Baltic Sea Region. Thematic research strands highly relevant for the BSR are:

- Demographic shifts accompanied by various vulnerabilities of different age groups of the active and non-active population,
- social inequalities of various sorts,
- new skills required in the contemporary and future labour market,
- solidarity of various sorts,
- diversity and nuances of welfare state regimes,
- a sustainable welfare state with an emphasis on green/low carbon/circular economy.

In future transnational research efforts space should be ensured for the collection and analysis of comparative qualitative data capable of enriching the knowledge produced on the basis of quantitative survey and administrative data. The prioritisation of certain data repositories is proposed, together with a note that a proper maintenance of high quality and systematic national data inputs remains the key for future research success and the delivery of projects with high scientific value.

Joint Programming in a Macro-regional Setting

This Work Package put a focus on joint financial support to research by exploring the experiences from the BSR in joint programming and collaborative efforts.[6] The aim was the joint development of incentives and funding schemes to foster transnational research and innovation uptake in BSR (Joint Programming). To find a common ground between the BSR members, the advice is to address potential stakeholders in each country who might be interested in the themes established in preceding BSN actions.

The proposed model for joint programming to start with is a **model inspired by the Röntgen-Ångström Cluster (RÅC)**, a Swedish-German research collaboration in the fields of Material Science and Structural Biology, i.e. **founded by the stakeholders,using existing structures for administration and peer review and also including planning for evaluations**. This can be seen as a variable geometry agreement from a macro-regional perspective since it does not involve any body above the national level to start with and includes only the most interested partners. National funds stays national. The programme is used as a collaborative layer on top of national funds. The level of collaboration between researchers is, however, much deeper compared to networking and every application for funds will also be evaluated in the peer review process from the perspective of the added value of the collaboration. The collaboration between funders is based on common programme committees and common evaluations.

6 Leif Eriksson (2019), Joint Programming in a Macro-regional Setting (WP 3.3)

Roadmap for Transnational Utilisation of Existing and Planned Research Infrastructure

In order to facilitate the macro-region's ability to become a leading player in the field of science and innovation, we need useful tools for enhanced cooperation between scientific institutions in the BSR and for a more efficient use of research infrastructure. To make potential funding opportunities more easily accessible and more transparent to stakeholders, BSN identified BSR's relevant research facilities, analysed best practices of research infrastructure utilisation and cooperation and created a roadmap.[7] This roadmap serves several purposes: Ministries are provided with suggestions for a more efficient use of RI and for a better socio-economic return of these RI. Scientific institutes can benefit from information on the current status of RI utilisation and from suggestions for improvement.,

With regard to the **general BSR strategic vision for the future** a number of aspects were identified:

- Increased cross-border cooperation and co-utilisation of research facilities will be facilitated and promoted and is expected to become a more usual way of working.
- More extensive and coordinated development of country strategies will contribute to more efficient use of resources and increased competitiveness of the macro-region.
- Cooperation with industries between countries will be on the agenda for all BSR countries.
- The attraction of global talents from outside of the macro-region was and will be on the agenda for all BSR countries to sustain the development of competitiveness and innovations.
- In the future, more aligned and coherent financing mechanisms will be developed in the region in order to facilitate the development of jointly financed projects.

The roadmap includes an assessment tool which can be used by RI as well as policymakers to evaluate the current preconditions for cooperation and identify possible actions in order to enhance the opportunities for future cooperation and to attract potential partners. Several **possible options for forms of cooperation** have been identified.

The most important factors for cooperation development are the scale or size of the RI, uniqueness, existing strategy for development, cooperation facilitation mechanisms, and personnel-related issues for attracting and supporting talent. All those factors should be assessed and addressed in an integrated manner since none of them alone is sufficient to provide a significant impact.

- Support the development of local nodes for international RI.
- Better integration and connection of small-scale RI as dedicated partner facilities with complimentary services to major RI in the BSR.
- Increase participation in different consortia.
- Support leading of projects and applications with extensive participation of partners from BSR.
- Formal cooperation should be supported by an informal one, e.g. more direct contact between scientists, will have a positive impact on cross-border cooperation between the institutes.

7 Aivars Timofejevs, Valdis Avotiņš, Vitolds Škutāns (2019), Roadmap for Transnational Utilisation of Existing and Planned Research Infrastructure (WP 3.4)

1.3 How do we move forward?

The diversity among partners who have different functional roles within the national research system (science ministries, university and research networks, funding agencies and programmes) leads to a variety of expectations and activities. This is also reflected in the Action Plans that partner institutions and organisations devised based on BSN's findings and requires a defined, yet flexible alignment between the different concepts. They all came together under common purpose and generate good ideas for closer scientific cooperation in the context of the BSR.

In their Action Plans the BSN members defined their priorities and strategies related to the BSR and to BSN's strategies. The focus was on transnational strategy, funding instruments, mobility schemes, and tools for widening participation on national and regional level. The results of the Action Plans very much reflected the outcome of the studies conducted in BSN.

As to the thematic fields that are of common interest for the BSR states, all partners have an active interest in Life Sciences, whereas half of the partners also support Photon and Neutron Science, Welfare State Research, as well as Maritime Science.

Foster transnational cooperation in the BSR (and bridge the widening gap)

As stated above a long-term cooperation with BSN as a think tank and a platform for macro-regional research policy coordination is the members' common goal. Therefore, BSN has to define strategic targets of BSR cooperation, establish cooperation in common scientific fields, and build up thematic networks. To stimulate common activities such as summer schools, trainings and mobility programmes in education and research, BSN will keep scientific institutes within the BSR informed about existing or future programmes. Already successful macro-regional collaborations will be addressed for further activities to strengthen transnational cooperation.

BSN has established a sound basis for discussion of macro-regional interests in regional and national ministries. The findings and experiences made in the BSN powerhouse will feed into current political debates and support the establishment of long-term activities.

SUCCESSFUL MACRO–REGIONAL COLLABORATION

HALOS Hanseatic League of Science

Fin-Est-Beamline Finnish-Estonian Beamline for Materials Science at MAX IV

SOLARIS National Synchrotron Radiation Centre, PL

STRING Southwestern Baltic Sea Transregional Cooperation

RÅC Röntgen-Ångström-Cluster

Transnational strategies and better utilisation of RI

The first step towards a better utilisation of research infrastructure has already been taken and synergies for cooperation within the BSR have been identified. Three research areas will serve as test beds for developing defined concepts and activities that will be in line with the recommendations the respective expert groups have submitted.

This includes the involvement of already existing summer schools (e.g. RACIRI, MATRAC) and the implementation of a mobility tool which will be explained in more detail in chapter 3.

The recently launched HALOS-project in the fields of Life Sciences and Photon and Neutron Science is a collaboration in the BSR bringing together the four unique research facilities MAX IV, ESS, DESY and European XFEL. This is an illustrative example for the creation of a globally competitive Life Science research and innovation hub. It is a spin-off of **BSN's transnational strategies** on Life Sciences and Photon and Neutron Sciences, as well as our suggestions on **short-term mobility** and **transnational utilisation of research infrastructures.**

The research project Hanseatic League of Science (HALOS) can be seen as a positive spill over of BSN's activities. It includes academic, regional, and corporate partners from Germany, Sweden, Norway, and Denmark. The HALOS project will forge even closer scientific cooperation in the Baltic Sea Region, and has planned for instance "short-seed" or six-month research projects and exchange programmes for researchers and for forums to make ideal use of the macro-regional infrastructure.

Promote excellent researchers and establish a new generation of scientists in the BSR

BSN discussed a wide range of measures that will lead to an internationally attractive environment for doctoral students and postdocs around the BSR. To promote interaction between research centres and universities some BSR ministries invite institutions to **share their experiences** in the BSR cooperation.
It is widely agreed that existing **university networks** should be encouraged to expand their alliances. As a best practice example the Baltic University Programme (BUP) will continue and further develop cooperation among universities in order to improve the capacity in research, and for researchers to provide answers to the great challenges faced globally and regionally in the BSR.

EXPAND BSR UNIVERSITY NETWORKS

- BUP (Baltic University Programme)
- BSRUN (Baltic Sea Regional University Network)

PROMOTE BSR SUMMER SCHOOLS:

- German–Swedish–Russian RACIRI summer school
- Baltic International Summer School (BISS) in Hamburg

To be able to focus on their research work early-career scientist need less bureaucratic burdens and more support in administrating projects. Many universities already try to tackle this challenge, e.g. By providing support personnel to project leaders. This support could be complemented by comprehensive **manuals for project leaders** (booklet, website) containing information on tasks, responsibilities, distribution of work, obligations, and rights of a project leader. Although each institution has its own guidelines institution has its own guidelines, many topics will overlap. Therefore BSN promotes the idea of coordinating existing manuals and creating a joint document that could be adjusted to the special needs of respective universities. BSN partner universities are willing to enhance the know-how and capacity of project leaders by developing a manual for common usage.

2. Mobility in Research and Higher Education

The Baltic Science Network examined the situation related **to researchers' mobility in the BSR countries.** With the use of tools such as studies by external experts in the field, surveys conducted among the research community, as well as a careful analysis of the multi-stakeholder perspective of the BSN members, a comprehensive collection of data and facts on mobility in the BSR countries has been compiled. Based on these findings, concrete mobility tools have been elaborated and proposed for implementation in order to take **actions against the existing obstacles** in a collaborative approach.

- The Baltic Sea Region lost popularity as a mobility region
- Need for national support programs for outgoing and incoming visits
- Need for a BSR-wide mobility programme

2.1 What have we done so far?

2.1.1 Which problems are we facing?

BSN Study "Challenges to researchers' mobility in the Baltic Sea Region"[8] revealed that a number of obstacles exists, preventing researchers to be mobile in the BSR. The challenges include:

- the BSR in general is not seen as a priority region for research mobility by the researchers, as well as by the research policy implementing bodies,
- absence of the national level measures for attracting talents to the country through the research mobility schemes,
- low level of initiatives at the research institution level to attract researchers from other countries,
- absence of the national support programmes for outgoing visits,
- technological differences in research instrumentation and infrastructure amongst institutions in the BSR countries create asymmetric mobility patterns in the region.

8 Gintaras Valinčius, Tadas Juknevičius (2017), Challenges to Researchers' Mobility in the Baltic Sea Region (WP 4.1)

Mobility flows are not even in the Baltic Sea Region

The German Academic Exchange Service (DAAD) had special focus on the Baltic Sea Region in their 2017 report "Wissenschaft weltoffen" (DAAD 2017). This report confirms the challenge identified by BSN: The Baltic Sea Region is not seen as a priority region for mobility.
Wissenschaft weltoffen (2017) report points out that "*student exchanges between the Baltic Sea area and the other Erasmus countries or the rest of Europe since 2003 have intensified more strongly than those within the Baltic Sea area itself. […] For students from Baltic Sea countries, the Baltic Sea area as a host region has thus lost popularity when compared with other possible European destinations since 2003.*" [9]

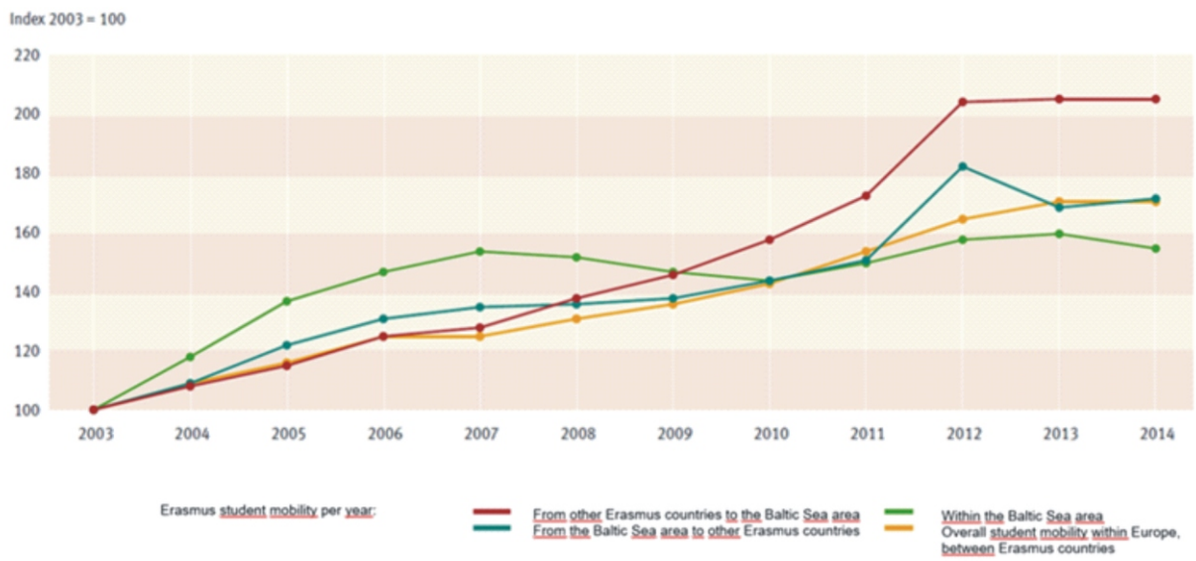


Fig.2: Development of student mobility in the Baltic Sea area since 2003

The report shows that there are considerable differences between countries. "[…] ***Germany*** *dominates student and researcher exchange in the Baltic Sea area both as a country of origin and as a host country. […] The eastern states of* ***Russia***, ***Poland***, ***Estonia***, ***Latvia*** *and* ***Lithuania*** *see a preponderance of outgoing mobility into the Baltic Sea area, while incoming mobility from the other Baltic Sea states is significantly less prominent. The situation in the three Nordic countries* ***Denmark***, ***Sweden*** *and* ***Finland*** *is virtually the opposite: here, incoming mobility, both from the eastern states and from Germany, is more prevalent, while outgoing mobility to other Baltic Sea states is relatively low. These different mobility profiles of the Baltic Sea states present a further major challenge for the future of academic exchange within the Baltic Sea area […]" (p....133).*[10]

- Unbalanced mobility flows
- Sweden is the most popular host country, Poland the least popular

9 DAAD, DZHW (2017): Wissenschaft weltoffen. Bielefeld. W. Bertelsmann Verlag, p.141.
10 DAAD, DZHW (2017): Wissenschaft weltoffen. Bielefeld. W. Bertelsmann Verlag, p.133.

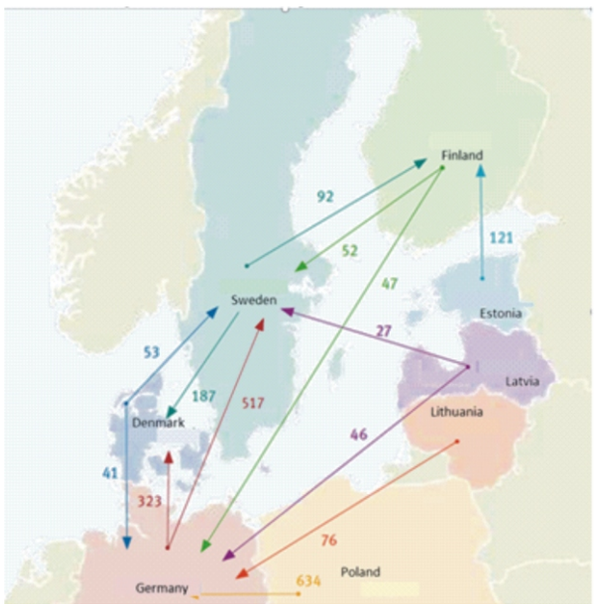


Fig. 3: Important mobility flows of internationally mobile doctoral candidates by countries of origin, 2014/2015 [11]

The analysis of major flows of internationally mobile doctoral candidates reveals that **Sweden** is the most popular host country in the Baltic Sea area for internationally mobile doctoral candidates from Denmark, Germany and Finland. Vice versa, **Poland** is among those less often selected as a host country by doctoral candidates from other Baltic Sea countries.

It is obvious that the mobility flow of academics and students is not equally spread within the Baltic Sea area[12]. The gap between EU-13, EU-15 and the non-EU countries together with the restricted access or eligibility to apply for EU-funds or programmes could be seen as one if not the major reason for it.

Existing mobility tools do not match the need

Mapping of the existing mobility tools[13] in Baltic Science Network study "Researcher mobility tools for the Baltic Sea Region"[14] identified 87 tools supporting researcher mobility in the Baltic Sea Region. The problem is that only a few of these tools are designed with a direct focus on the Baltic Sea Region, and most of the tools are rather small-scale, with the exception of BONUS-EEIG. Best practices in overcoming the key challenges identified in Baltic Science Network exist, but none of the tools answers efficiently all mobility challenges in the BSR.

- 87 mobility tools in the BSR identified
- No correspondence between tools and mobility challenges

11 DAAD, DZHW (2017): Wissenschaft weltoffen. Bielefeld. W. Bertelsmann Verlag, p..151.

12 A marked East-West disparity between the Baltic Sea states is currently apparent, which can almost certainly be explained by the Eastern countries' need to catch up in the wake of their acceptance within the Erasmus programme (cf. Wissenschaft weltoffen).

13 Researcher mobility tools were in this study defined as set practices, agreements or funding instruments that facilitate researcher mobility with focus on or including the Baltic Sea Region.

14 Susanna Sepponen, Solveig Roschier, Marika Bröckl, Jenni Mikkola and Mari Hjelt (2018), Researcher Mobility Tools for the Baltic Sea Region (WP 4.2)

Lessons to be learned

During the CBSS workshop (Oct. 2017) DAAD presented lessons to be learnt for the future based on the "Wissenschaft weltoffen" report. The lessons for the future include the following suggestions:

- Academic mobility and cooperation within the Baltic Sea area is not a sure-fire success. It requires targeted incentives and extensive institutional support.
- The evidence available points to an especially negative development with regards to students' degree mobility within the Baltic Sea Region.
- Academic mobility and cooperation within the Baltic Sea Region is heavily imbalanced. This clear East-West divide should especially be targeted by future support programmes.
- A focus on junior researchers in future mobility programmes seems to be advisable. Here, a lack of suitable mobility programmes can be observed compared to the higher number of programmes aimed at students and senior researchers.
- Incentives and support for a sustainable promotion of academic mobility and cooperation should be focused on the common interests of the Baltic Sea partners (i.e. protecting the Baltic Sea ecosystem, exploring their shared culture and history).

The mobility needs of the universities in the Baltic Sea Region

Baltic University Programme (represented in BSN by Åbo Akademi University) studied the wishes and needs of its more than 200 member institutions with regard to mobility and research cooperation. The study[15] revealed that the universities have numerous opportunities for academic mobility around the world, but that it is important to promote the BSR as the region for mobility, especially if the intention is to change the trend from "brain drain" to "brain circulation".

Mobility, organised as separate, short-term mobility programmes for teachers and young researchers, was proposed in the surveys to be included in e.g. the BUP network. Furthermore, it was underlined that doctoral students' short term visits (pilot studies), conferences, and summer and winter schools are useful instruments to support mobility.

These activities are popular among the potential participants, and would give value added to the training. BUP recommends **focusing on MSc and PhD level mobility tools**, as this could help the students to establish contacts with other scientists from the BSR early in their careers and thus foster networks in the region.

15 Paula Lindroos, Sinikka Suomalainen (2019) Baltic Science Network Learning Experiences (WP 6.2)

2.1.2 What could we do?

Based on the information gathered, in total 6 **mobility** tools were created in BSN in total, of which 3 were selected for more thorough development. Each of these tools shares the same **guiding principles: excellence, transparency and continuity**. All of the tools are designed to be flexible so they can be adjusted based on the financing available.

3 mobility tools proposed

- Summer Schools for Large
- Research Infrastructures
- Research Internships
- Short-term PhD visits

The mobility tools are targeted at young researchers, as implementation of the tools could help them establish their networks in the Baltic Sea Region, which could lay basis for research cooperation in the BSR in the future. As an example of outcomes, international co-publications tend to be cited more than publications produced in national cooperation.[16]

The mobility tools proposed by BSN are:

Summer Schools for Large Research Infrastructures

In this tool, large-scale research infrastructures could arrange a summer school with the Baltic Sea Region in mind. This tool is expected to widen the user pool of the large-scale research infrastructures and give opportunities to use research infrastructure to those who do not have these infrastructures in their country.

Research Internships

Research internships offer doctoral students the possibility to hire master/bachelor students for their research projects for an internship period. Working jointly on a research project of mutual interest will foster personal ties between different nationalities as well as the interest in research and in scientific cooperation. Additionally, the PhD students gain valuable leadership skills. There are no comparable EU programmes available.

Short-term PhD visits

Short-term PhD visits in our proposal are for 1-3 months. The programme will help to achieve the research objectives of individual PhD students. It will strengthen their organisational skills, their confidence and their interest in international cooperation, which is a good starting point for future cooperation with the BSR.

The mobility tools have been designed by BSN Work Package 4, and they have been approved by BSN partners as potentially relevant to interested stakeholders in the Baltic Sea macro-region. The BSN Expert Groups in Photon and Neutron Science, Life Sciences and Welfare State were also consulted to evaluate and adjust the tools. The mobility tools are presented in more detail in the BSN A4.3. Working Paper.[17]

16 E.g. Muhonen, Reetta; Leino, Yrjö and Puuska, Hanna-Mari (2012) International co-publishing in Finland. Available at: http://urn.fi/URN:ISBN:978-952-263-133-6

17 Tomas Andersson (2018): Mobility Funding Instruments

Scientific Excellence in the Baltic Sea Region

The Baltic Sea Region has many fields of research where excellence can be found. In its study "Scientific Excellence: Joint Potentials in the Baltic Sea Region an explorative study"[18] BSN has identified five key areas. These mutual expert areas have high scientific quality, existing cooperation networks within the BSR. BSN aims to implement the mobility tools in three fields previously identified as fields of scientific excellence: Life Sciences, Welfare State and Photon and Neutron Science. In addition, the fields Marine Research and Maritime Technology could benefit from the mobility tools as an additional measure beside BONUS-EEIG. The BSN publication "Research and Innovation Excellence in the Baltic Sea Region" showcases some of the research highlights in the BSR.

2.2 How do we move forward?

Connecting mobility and science

The Baltic Science Network strongly believes that the **implementation of these three mobility tools will help to solve challenges to mobility in the Baltic Sea Region**. BSN is actively searching and applying for further external funding for implementation of the mobility tools. This will help BSN set up the administration for the mobility tools, but BSN needs **support to finance the actual mobility grants**.

After having developed the concepts for the joint mobility tools, the next step was to look into the practical implementation. The BSN members, being a multi-stakeholder network representing science ministries, funders and research institutions, have prepared individual Action Plans in order to design how the particular institution can foster the implementation of the mobility tools. The form of support activity differs according to the perspective of the partner and the institution's activity - there is the perspective of universities and research institutions, as well as of regional ministries, funding agencies, and international BSR networks.

18 Kazimierz Musiał, Tom Schumacher (2018), Scientific Excellence: Joint Potentials in the Baltic Sea Region an Explorative Study (WP 3.2)

Opportunities of implementing the mobility tools

Implementation of the proposed mobility tools will bring many new opportunities to individuals, institutions and research infrastructures in the Baltic Sea Region.

The Baltic Sea Region is a macro-regional area where geographical proximity offers opportunities which are not used efficiently. Implementing the mobility tools will most likely help prevent brain drain in the Baltic Sea Region and support capacity building in areas where it is needed.

By means of the mobility tools, universities, research institutions and research infrastructures will get additional opportunities to increase their capacity and expertise and to explore cooperation with strategic partners in the Baltic Sea Region. Implementation of the mobility tools will bring universities, research institutions and research infrastructures opportunities for future recruitment for research and education positions.

Researchers will get opportunities to enlarge their own networks and to find new partners for their research, and possibilities of finding new research questions. Participating in the mobility will build the researchers' own capacity and expertise and it could enlarge the researchers' own recruitment markets.

Science and research will benefit from the implementation of the mobility tools as this will help promote research fields, increase discussion and spark new ideas. Research papers produced in international cooperation have proven to reach higher citations and thus higher impact. Mobility in the Baltic Sea Region will promote excellence in research in the macroregion.

3. Widening Participation

3.1 Why does BSN focus on this topic?

The statistics on the 7th Framework Programme for Research and Technological Development (2007 - 2013) suggested that despite receiving support from the European Structural and Investment Funds (ESIF) for developing the economy of the EU Member States,the research performance of **most of the EU-13 coun-tries fell short of that of the EU-15 Member states**. In the 8th Framework Programme Horizon 2020 (H2020), a set of directly targeted measures have been introduced (e.g. SEWP - Spreading Excellence and Widening Participation), however, EU-13 still get a substantially lower share of funding and the parti-cipation of many EU-13 countries in research consortia and international research projects is still low. EU funding has allowed the BSR instruments (e.g. BONUS, INTERREG) to evolve into larger and stronger com-mitments which have a chance of developing into long-lasting instruments in the future, and other instruments should follow.

Organisations in Widening Countries should be encouraged to further develop and take better advantage of their research and innovation potential. Therefore, it is necessary to design a number of specific measures involving investing, networking, communication and thematic activities on a national, regional, and the EU level. Close geographical proximity alone does not account for increasing interest in cooperation. Whereas the Nordic countries display intensive cooperation (e.g. With NordForsk as a supportive transnational governance structure),there are rather **weak inner Baltic RDI ties** despite relatively similar RDI challenges and research structures. Due to the reserved attitude of the Nordic States in terms of cooperation with their Eastern neighbours, there are only a few RDI collaborations with the Nordic states, but rather strong cooperation ties with the leading research centres based in Western Europe.

Thus, functional, social and organisational proximity between the countries is still too low to facilitate RDI policy convergence. It turns out that bilateral cross-border cooperation between few organisations is more effective than platforms and projects covering the entire BSR. So far the focus of the EU-13 countries is more on specific projects, a joint long-term perspective on collaborative activities is less pronounced.[19]

3.2 What have we done so far?

3.2.1 Which problems are we facing?

In order to gain an insight in the current situation of transregional research cooperation and BSR participation, BSN conducted several comprehensive studies and surveys analysing existing measures of support and partnership instruments, and identifying barriers for cooperation.

The studies conducted in this project came to quite similar conclusions explaining the relatively low levels of participation of the Baltic States and Poland in research consortia and international research projects.

Apart from Estonia, where widespread liberalisation and deregulation processes at the fastest pace have been pursued, Latvia, Lithuania and Poland still face challenges in the prioritisation and coordination of their R&I systems and the design and implementation of their reforms. Estonia has aligned its R&I strategies with the European policies and channelled the Structural Funds into the development of R&D infrastructure, human capital and entrepreneurship.

- Lack of appropriate excellent research infrastructure
- Insufficient information and communication system
- Lack of qualified local staff for producing excellent proposals
- Administrative burden
- National competitive funding of R&I
- Variation in wage levels
- Closed networks
- Language barriers

Analyses of FP participation revealed that **participation in transnational large-scale projects is correlated with the national research investment in research infrastructure and R&D personnel**. Thus the capacity of research performers to design and pursue excellent research projects at the European level projects could be problematic for the EU-13 countries because of the related **lack of appropriate excellent research infrastructure**, missing experienced support for science management, and problems in raising funds for large projects. This situation is changing, as in H2020 the EU-13 countries participated more in large projects. However, the coordinator role was usually restricted to smaller projects, a fact that is associated with the lack of administrative support and experience. Large projects also need and experipondingly high-level (national) co-funding which often cannot be provided by the EU-13 countries.

It is evident that the R&D systems in different countries depend on the international (foreign) funding to a different degree (Fig. 4). The dependence of national innovation systems of the BSR countries on external funding sources is more than twice as large in EU-13 compared to the EU-15 countries. Investment in research is considered essential and the **EU-13 countries would often need stronger investment into infrastructure and basic research capabilities** than soft mechanisms of network building, such as COST, Twinning etc.

19 Visionary Analytics with support from the Ventspils High Technology Park (2017), Study on Research Cooperation in the Baltic Sea Region: Existing Networks, Obstacles and Ways Forward (WP 5.1)

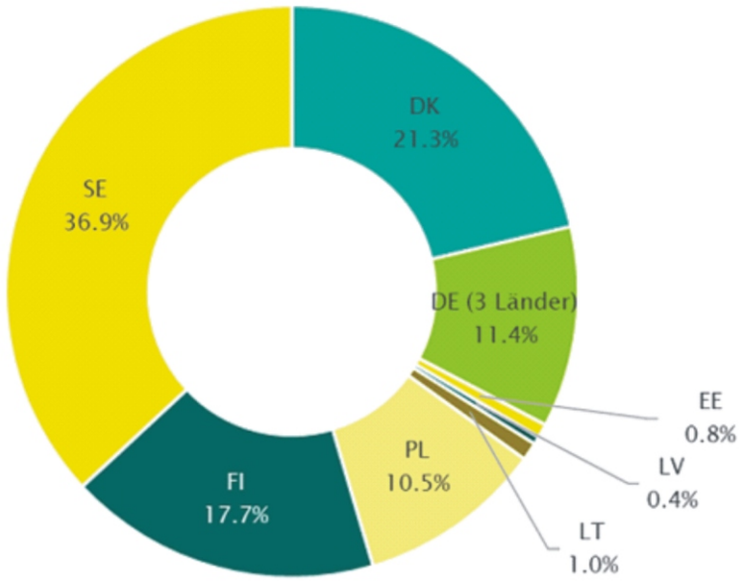


Fig. 4: Share of countries in total R&D expenditure of BSR region in 2014.[20]

Another key challenge for the EU-13 countries is the **information and communication** system, as there is a lack of knowledge about and an overview of existing research BSR cooperation projects and funding possibilities. Though the situation has improved in some countries through the introduction of centralised National Contact Points or decentralised forms such as in-house expertise responsible for information, communication and trainings. These countries benefit from the experience of professional staff members in the application phase and project management.

This brings us to the importance of available qualified staff - another serious obstacle for researchers from LV, LT and PL to secure higher funding. **To deliver excellent proposals, it takes qualified local staff** with the necessary experience in proposal writing. Low success rates in applying for EU funding also decrease motivation in participating.However, this does not account for all Baltic countries. Among moderate innovators, researchers from EE perform rather well and are on their way to catch up with the EU-15 countries, whereas Poland has the lowest application rates.

Administrative burden combined with relatively low success rates in applications leads to a decreased motivation for participating in EU projects. Especially co-funded projects with multiple interested parties are exposed to a huge amount of bureaucracy facing diverging application formalities, accountability requirements, and reporting systems.

Sometimes applying for **national competitive funding of R&I** is more compelling because it is easier to acquire (e.g. in LV, LT and PL). In EE national funding plays a significant role already for years, leading to a remarkable performance in R&I. In general a better adjustment between the administration of national and EU funding would reduce the bureaucratic overload.

Variation in wage levels across countries leads to differences of the level of FP funding for countries. This has negative impacts as the salary disparity affects transnational mobility of researchers, driving brain drain and reducing the attractiveness of the Widening Countries.

20 Kadri Ukrainski, Erkki Karo, Margit Kirs, Hanna Kanep (2017), Participation in ERA and Baltic Sea RDI Initiatives and Activities: Analysis and Policy Implications for Widening Participation of Strong and Moderate Innovators, p.23.

Closed networks and the related lobbying power can constitute a barrier for newcomers to participate in EU projects not only on an international but also on national level. Low performing countries often have only limited access to already well-established networks and the clustering of leading research performing countries.

Language barriers may play a role in different contexts. On the one hand, especially administrative staff lacks sufficient language skills in dealing with international projects. On the other hand the demand for local language proficiency may cause problems for inward mobility / international guest scientists.

3.2.2 What could we do to solve them?

For building a globally competitive European Research Area (ERA) we need to bridge the gap that still exists between the EU-15 and EU-13 countries. To reach this goal this issue has to be addressed on all levels: regional, national, macro-regional, and EU level.

BSN has put forward a detailed set of recommendations following comprehensive studies on widening participation, which had been delivered to the European Commission and to other relevant stakeholders in the BSR, such as science ministries and research institutes. To target research to BSR specific needs we have to **focus on joint research areas, develop clear national strategic plans** and **align national objectives with those of the EU.**

Three fundamental tasks that have to be approached at all levels are

- a significantly higher investment into R&I in EU-13 countries,
- a better accessibility of research programmes and infrastructure, and
- simplification of administrative rules.

On the EU level, BSN put forward following suggestions for promoting widening participation:

- More bottom-up initiatives such as international and cross-sectorial mobility and networking, thematic conferences and summer schools, or short- and long-term fellowships for (early-career) researchers,
- increased ESIF funding to leverage research networks by facilitating researcher mobility,
- harmonising the rules of the Research and Innovation Framework Programmes and other structural measures (e.g. ESIF) to ensure all kinds of funding can be effectively combined,
- allocate more investments to adjust the imbalanced success rates,
- better communication of national research and policy circles with EU counterparts.

The studies revealed that the BSR is yet to emerge as an integrated macro-regional research area, therefore, BSN and its partners should adopt the following recommendations:[21]

- To increase the research cooperation in the macro-region, BSN has to agree on **joint research themes** to be implemented in a multilateral fashion during the upcoming years,
- **jointly promote the interests** of the macro-region **at the EU level**,
- at the macro-regional level the BSR should try to amplify the effect of FP funding in areas of strategic importance by introducing innovative instruments. **Bottom-up initiatives** for speeding up transnational cooperation are considered to be an effective way of reaching this goal. However, they should be **supported by top-down initiatives**. Possible instruments could be BSN research prizes; 2nd best funding grants for good quality applications relevant for BSR (European Research Council, H2020); virtual service centres and shared service centres,
- support the creation of an **image of the BSR as a European macro-region** characterised by an outstanding innovation track record and resilience. Joint efforts of the BSR countries in creating visibility but also shaping the design of these policies would lead to greater success.

3.3 How do we move forward?

All intended actions described in the areas of Research Excellence and Mobility could also offer a major benefits in the field of Widening Participation.

Excellent science needs effective communication and dissemination

Communication activities and dissemination are of crucial importance for attracting scientists especially in the EU-13 countries. Ministries of the Baltic States are willing to forward BSR specific information to already well-functioning networks and databases in the EU (ESFRI roadmap, EURAXESS platform). Also at national level many useful **databases and roadmaps on research infrastructure** have been developed (e.g. Research in Estonia, Lithuanian Roadmap for Infrastructure). By raising the awareness of researchers - in particular unexperienced and less connected researchers from the EU-13 Member States - of **ongoing activities and available cooperation opportunities** more EU-13 scientists will be integrated in the research networks within the BSR and can be encouraged to set up own projects.

21 Ministry of Education and Research of the Republic of Estonia (2018), Drivers for Participation in Transnational Research Cooperation, Recommendations for Increasing Participation of Low Performing Countries and Regions in Transnational Research Activities (WP 5.2)

Pilot action for mutual awareness

Despite a wide range of excellent small-scale research infrastructure, the EU-13 states within the BSR often lack the necessary integration into the major RI in the EU-15 states. The BSN expert group on Photon and Neutron Science formulated strategies for a closer interaction between theses member states. Their ideas mounted into a support pilot action that will be on the agenda of future BSN activities: **LaunchPad: RI_Connectors** for PNS RI.

LaunchPad aims at raising the awareness of large-scale RI about complementary small-scale RI in the EU-13 countries. On the other hand the EU-13 countries increase their capacity to seize research cooperation opportunities with large-scale RI. Stakeholders will be encouraged to contribute their ideas for improvement at workshops and symposia. To produce a sustainable outcome, the action will be consulted at the LaunchPad forum and evaluated by an independent expert panel.

4. Outreach to the European Union

BSN has filled in the gap in the BSR by providing an exchange, advice and cooperation platform supporting decision-makers in the area of science and research policy by focusing on the **macro-regional dimension in science policy**. The initiative provides an added value in dealing with the obstacles that the BSR countries are frequently facing during implementation of science and research activities, such as underrepresentation in consortia funded by the EU, brain drain from East to West, and an insufficient representation of macro-regional interests on the policy-making level, especially on the EU level. An increased awareness of these issues has been achieved by the intensive outreach activities of the network during 10 conferences and high-level meeting events which attracted participants from the EU Commission,national and regional ministries, representatives of academia as well as other projects, programmes and initiatives fostering the BSR cooperation in science and research.

During its existence BSN managed very well to position itself as a key player in the field of science policy within the existing BSR-cooperation structures: BSN is a flagship of the EU Strategy for the BSR and a cornerstone of the CBSS Science, Research and Innovation Agenda. During the latest update of the EUSBSR Action Plan BSN managed to make that "research" its own area of action in the EUSBSR. Furthermore, BSN is actively involved in the current debate about an update of the EUSBSR with its ideas.Due to active influence by BSN, the Baltic Sea Parliamentary Conference 2017 in Hamburg discussed intensively the science and research cooperation in the BSR. .

BSN Outreach during Events

15-17 June 2016, Cracow, CBSS Ministerial and BSN political kick-off
10-11 November 2016, Stockholm, EUSBSR Annual Forum, BSN panel discussion
18 January 2017, Copenhagen, BSN-Transnational WS on mobility
8 February 2017, St. Petersburg, 1st CBSS Baltic Sea Science Day
10 February 2017, Vilnius, BSN-Transnational WS on research excellence
13-14 June 2017, Berlin, EUSBSR Annual Forum, BSN panel discussion
15 November 2017, Tallinn, BSN-Widening Conference in cooperation with the Estonian EU-presidency
24-26 January 2018, Turku, BUP Rectors Conference and 2nd CBSS Baltic Sea Science Day
26 November 2018, Brussels, BSR Powerhouse of Science-Conference
22-23 February 2019, Riga, CBSS High Level Meeting on Science and BSN-Final Conference

Especially the organisation of the **conference *Baltic Sea Region - A Science Powerhouse* in Brussels** (26.11.2018) with high-ranking representatives from the national and EU level provided a summary of the work done so far and the needs still to be addressed. The audience including representatives of EU organisations and networks from Brussels had fruitful discussions about the BSR macro-region and important links that could be developed further. The elaboration on the widening question, as well as comments on the FP9 programme in the form of two policy papers were an important tool constituted outreach within and to EU on the BSR related issues.

Positive feedback has already been received from the **European Commissioner for Research, Science and Innovation at European Commission Carlos Moedas** and various **representatives of regional and national ministries**, e.g. during ministerial high-level conferences.

BSN Position Papers

- Baltic Science Network Position Paper "Tackling widening participation in R&I from the BSR perspective"
- Baltic Science Network Policy Paper regarding the FP 9.

Organisation of and contribution to events as well as comprehensive press work via newsletters, social media and articles **increased the awareness of and engagement about the BSR macro-regional perspective in science and research** and allowed a **wide dissemination of knowledge** generated within the scope of BSN by its partners, BSN expert groups composed of representatives from the academic sector, as well as by external experts in the field.

5. Outlook: future perspectives and opportunities

Macro-regional science policy in the BSR has been the sleeping beauty of regional cooperation for a long time. BSN has given her the wake up kiss!

Although multilevel governance is a challenging process, BSN has proven to be a **trustworthy network with the ability to enable progress in the macro-regional perspective of science and research policy**. The multi-stakeholder composition of the network has ensured the integration of different perspectives on science policy (ministries, universities, funding agencies and international actors) and therefore impact has been achieved at various levels and reached all the vital groups of stakeholders.

Although a number of outputs has successfully been achieved in line with the set goals, the network still has **ambitious targets to follow in the future**. A great emphasis will be placed on **strengthening the collaboration between universities and research institutions in the BSR**.

BSN has already proven to be an excellent umbrella for many initiatives undertaken in the Baltic Sea area. In the future the network has the ambition to further expand its impact to function as an accelerator of joint science and research policy and projects in this macro-region. There are numerous universities in the BSR.

BSN can foster cooperation between these institutions, so that they are more aware of the potential within the region and take up the opportunity to work together.

This pooling of expertise in turn is expected to make a difference in the context of a better visibility of the BSR research potential on the international arena. BSN is an excellent vehicle for this purpose.

The Baltic Sea region is as model region and test bed for the European Research Area. BSR as a region has access to the biggest funding programme for research in the history of European research collaboration, Horizon 2020, and the approaching Horizon Europe. This is an opportunity that definitely needs to be taken as a tremendous option for an intensified research collaboration for the benefit of our societies. But we could even go a step forward: By pooling our voices and votes on the European level we are able to leave a significant BSR-footprint on the architecture and the content of Horizon Europe. The incoming EU-presidencies of Finland in 2019 and Germany in 2020 are "windows of opportunities", which we should use.

In times of growing tensions another major task for the future will be a stronger integration of Russia, Belarus and Ukraine into the research cooperation within the macro-region. BSN could act as an active bridge builder in this field and facilitate this process.

The BSN project has opened several new avenues for research and research policy cooperation within the BSR. By implementing the BSN-transnational stratgies we have the chance to develop European cluster of excellence in the fields of Photon & Neutron Sciences, Life Sciences and the Future of the Welfare State in our macro-region. As a result, BSN can substantially help to successfully exploit the research capacity of the whole BSR in the future.

The basic prerequisite of international research collaboration is the flow of ideas and the mobility of academics and students. Therefore BSN has put great emphasis in its work on the development of new macro regional mobility tools focussing on young researcher at an early stage of their career.

The mobility tools proposed by BSN are:

Summer Schools for Large Research Infrastructures

In this tool, large research infrastructures could arrange a summer school with Baltic Sea Region in mind. This tool is expected to widen the user pool of the large-scale research infrastructures and give opportunities to use research infrastructure to those who do not have these infrastructures in their country.

Research Internships

Research internships offer doctoral students the possibility to hire master/bachelor students for their research projects for an internship period. Working jointly on a research project of mutual interest will foster personal ties between different nationalities as well as the interest in research and in scientific co-operation. Additionally, the PhD students gain valuable people management skills. There are no comparable EU programs available.

Short-term PhD visits (1-3 month)

The program will help to achieve the research objectives of the individual PhD students. It will strengthen their organisational skills, their confidence and their interest in international cooperation, which is a good starting point for future cooperation with the BSR.

Baltic Sea Region is a macro-regional area where closeness offers opportunities which are not understood clearly. Implementing the mobility tools will help prevent brain drain in the Baltic Sea Region and support capacity building in areas where it is needed. The mobility flow of academics and students is not equally spread within the Baltic Sea Region yet. BSN gives the opportunity to overcome these differences (especially decrease the presently clear East-West gap in the macroregion) with its mobility tool.

Universities, research institutions and research infrastructures will get additional opportunities to increase their capacity and expertise and to explore strategic partners in the Baltic Sea Region.
Researchers would get possibilities to enlarge their own networks and to find new partners for their research, and possibilities to find new research questions. Those examples are only the beginning of the possibilites that can be fostered by BSN as a multi-level actor network in the next years.

The focus of BSN in the next two years lies on the **sustainable and long-term implementation of the BSN project outputs**: establishment of our developed mobility tools and implementation of the **transnational strategies**. A crucial aspect of the network will be our joint efforts for **a stronger transnational dimension in future EU research funding and R&I policy**:

Studies and reports published by BSN show a high research potential, that needs to be unlocked by targeted initiatives BSN is a reliable partner to provide support in this process.

ANNEX

A 1 Partner list: Members of the Baltic Science Network

Country	Institution(s)
Germany	Ministry of Science, Research and Equalities, Hamburg
	Ministry of Education, Science and Cultural Affairs, Land of Schleswig-Holstein
	Ministry of Education, Science and Culture, Land of Mecklenburg-Vorpommern
	Senate Chancellery Hamburg
	German Academic Exchange Service (DAAD)
Estonia	Ministry of Education and Research of the Republic of Estonia
Latvia	Ministry of Education and Science of the Republic of Latvia
Lithuania	Research and Higher Education Monitoring and Analysis Centre (MOSTA)
Poland	Ministry of Science and Higher Education of the Republic of Poland
	University of Gdansk (nominated by the Polish Ministry of Science and Higher Education)
Denmark	Ministry of Higher Education and Science
	Danish Agency for Science and Higher Education (DAFSHE)
Sweden	Swedish Research Council
Finland	University of Turku (nominated by the Finnish Ministry of Education and Culture)
	Åbo Akademi University (as representative of the Baltic University Programme)
	Finnish Ministry of Education and Culture
Norway	Ministry of Education and Research
Russia	St. Petersburg State University of Economics (UNECON - nominated by the Russian Ministry of Education and Science)
Transnational	Council of the Baltic Sea States (CBSS)
	NordForsk – Research funding organisation of the Nordic Council of Ministers
	BUP - Baltic University Programme
	BSRUN - Baltic Sea Region University Network
	BONUS - Baltic Organisations' Network for Funding Science EEIG
	STRING - Political cross-border partnership of the Öresund region

A2 List of studies/surveys: BSN reports and working papers

… in reversed chronological order

- Paula Lindroos, Sinikka Suomalainen (2019), Baltic Science Network - Learning Experiences (WP 6.2)
- Leif Eriksson (2019), Joint Programming in a Macro-regional Setting (WP 3.3)
- Aivars Timofejevs, Valdis Avotiņš, Vitolds Škutāns (2019), Roadmap for Transnational Utilisation of Existing and Planned Research Infrastructure (WP 3.4)
- Blanka Thees (2019), Creating unique and sustainable value through Scientific Excellence in Photon and Neutron Science in the Baltic Sea Region (WP 3.2)
- Tomas Andersson (2019), Mobility Funding Instruments (4.3)
- Asta Juškienė, Paulė Gumbelevičiūtė, Tadas Juknevičius (2018), Research and Higher Education Monitoring and Analysis Centre (MOSTA) (WP 6.1)
- Jyrki Heino, Fredrik Björkling, Thomas Frahm, Toivo Maimets, Osvalds Pugovičs, Gintaras Valincius, and Krzysztof Bielawski (2018), Scientific Excellence in Life Sciences in the Baltic Sea Region (WP 3.2)
- Zane Šime (2018), Working Paper of the Welfare State Expert Group "Fostering Sustainable and Inclusive Labour Markets in the Baltic Sea Region: A Life Course Perspective" (WP 3.2)
- BSN Position Paper (2018), Baltic Science Network Position Paper "Tackling Widening Participation in R&I from the Baltic Sea Region Perspective" (WP 5.2)
- BSN Policy Paper Regarding FP 9 (WP 2.3)
- Susanna Sepponen, Solveig Roschier, Marika Bröckl, Jenni Mikkola and Mari Hjelt (2018), Researcher Mobility Tools for the Baltic Sea Region (WP 4.2)
- Ministry of Education and Research of the Republic of Estonia (2018), Drivers for Participation in Transnational Research Cooperation, Recommendations for Increasing Participation of Low Performing Countries and Regions in Transnational Research Activities (WP 5.2)
- Kazimierz Musiał, Tom Schumacher (2018), Scientific Excellence: Joint Potentials in the Baltic Sea Region - an Explorative Study (WP 3.2)
- Key Messages of BSN studies in the 1st phase (2018), Baltic Science Network Brings the Baltic Sea Region Towards Enhanced Functional Proximity and Inclusive Excellence
- Gintaras Valinčius, Tadas Juknevičius (2017), Challenges to Researchers' Mobility in the Baltic Sea Region (WP 4.1)
- Visionary Analytics with support from the Ventspils High Technology Park (2017), Study on Research Cooperation in the Baltic Sea Region: Existing Networks, Obstacles and Ways Forward (WP 5.1)

- Indra Giraitė, Tadas Juknevičius (2017), Overview of the Best Practices of Researchers' Mobility Programmes (WP 6.1)

- Kadri Ukrainski, Erkki Karo, Margit Kirs, Hanna Kanep (2017), Participation in ERA and Baltic Sea RDI Initiatives and Activities: Analysis and Policy Implications for Widening Participation of Strong and Moderate Innovators (WP 5.2)

- Josephine Them Parnas (2017), Challenges and barriers to research cooperation in the Baltic Sea Region (WP 3.1)

- Tom Schumacher (2016), International Mobility of Researchers in the Baltic Sea Region

All BSN publications are available online at
http://www.baltic-science.org/index.php/publications

Additional references

DAAD, DZHW (2017): Wissenschaft weltoffen. Bielefeld. W. Bertelsmann Verlag.
Available online at
http://www.wissenschaftweltoffen.de/publikation/wiwe_2017_verlinkt.pdf

A3 List of abbreviations

Baltic TRAM	Baltic Transnational Research Access in the Macroregion
BONUS	Baltic Organisations' Network for Funding Science
BONUS-EEIG	BONUS Secretariat (European Economic Interest Grouping)
BSN	Baltic Science Network
BSPC	Baltic Sea Parliamentary Conference
BSR	Baltic Sea Region
BSRUN	Baltic Sea Region University Network
BUP	Baltic University Programme
CBSS	Council of the Baltic Sea States
CREMLIN	Connecting Russian and European Measures for Large-Scale Research Infrastructure
DAAD	Deutscher Akademischer Austauschdienst (German Academic Exchange Service)
DESY	Deutsches Elektronen-Synchrotron
ERA	European Research Area
ESFRI	European Strategy Forum on Research Infrastructures
ESIF	European Structural and Investment Funds
ESS	European Spallation Source
EU	European Union
EU-13	Countries that joined the European Union in 2004 or later
EU-15	Countries that joined the European Union before 2004
EURAXESS	Pan-European initiative delivering information and support services to professional researchers
EUSBSR	European Union Strategy for the Baltic Sea Region
FinEstBeAMS	Finnish-Estonian Beamline for Materials Science at MAX IV
FP9	9th EU Framework Programme for Research and Innovation
H2020	Horizon 2020 (9th Framework Programme for Research and Innovation)
HALOS	Hanseatic League of Science
LEAPS	League of European Accelerator-based Photon Sources
LENS	League of Advanced European Neutron Sources
LINX	Linking Industry to Neutrons and X-rays
MAX IV	Synchrotron radiation facility in Lund (SE)
MOSTA	Research and Higher Education Monitoring and Analysis Centre
NGO	Non-governmental organisations
OECD	Organization for Economic Co-Operation and Development
PNPI	St. Petersburg Nuclear Physics Institute
PNS	Proton and Neutron Science
PPP	Public-Private Partnership
R&D	Research and Development
R&I	Research and Innovation
RÅC	Röntgen-Ångström Cluster
RACIRI	German-Swedish-Russian Collaboration of the Röntgen-Ångström-Cluster (RÅC) and the Ioffe-Röntgen-Institute (IRI)
RDI	Research, Development and Innovation
RI	Research Infrastructure
RIS3	Research and Innovation Strategies for Smart Specialisation
SEWP	Spreading Excellence and Widening Participation
SOLARIS	SOLARIS National Synchrotron Radiation Centre
STRING	Southwestern Baltic Sea Transregional Area
WP	Work Package
XFEL	European X-Ray Free-Electron Laser


Baltic
Science
Network