

Baltic TRAM Smart Specialisation Trends

Baltic TRAM Briefing Note 1/2019





Baltic TRAM in Brief

The Baltic Transnational Research Access in the Macro-region (TRAM) project offered 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-sized enterprises – thus contributing to the regional effort of making the Baltic Sea Region innovative, sustainable and competitive.

To achieve this, Baltic TRAM has established a Baltic Sea Region-wide Network of Industrial Research Centres, which serves as a multilateral interface facilitating macro-regional acquisition of the most appropriate analytical research services for each business applicant's needs.

Baltic TRAM builds on the findings of the Science Link project, an initiative which received EU project funding from 2012-2014. Science Link is currently operated as a network, and its purpose is to encourage innovation and entrepreneurship in the Baltic Sea Region, to strengthen the macro-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 macro-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



Month of publishing: February 2019

Output of the Work Package 3: Baltic TRAM Briefing Note 1/2019 (corresponding to the Baltic TRAM Activity 3.1)

Front page photo credit: Photo by Ivars Utinsns on Unsplash

Output of the Baltic TRAM Activity 3.1, part of the Work Package 3 led by the Project Partner 14 the CBSS Secretariat.

The information and views set out in this publication are those of the author and do not necessarily reflect the official opinion of the Council of the Baltic Sea States. The responsibility for the whole briefing note, including any possible mistakes, lies with the Baltic TRAM Work Package 3 Leader Zane Šime. The Council of the Baltic Sea States cannot be held responsible for any use, which may be made of the information contained therein.

The report has significantly benefited from the responsiveness of the Baltic TRAM Project Partner (PP) 3 University of Turku, the PP 4 Kainuun Etu Oy ltd, the PP 13 University of Tartu, PP 17 Kaunas Science and Technology Park,

For further enquiries please contact:

Ms Zane Šime

Communication & Research Coordinator, CBSS Secretariat

zane.sime@cbss.org

+46 8 440 19 25

+46 7 030 15 126



Table of Contents

Introduction	6
1. Value of the Baltic TRAM Open Call's Results	6
1.1 Support for the Pharmaceutical Companies	7
1.2. Support for the Sustainable Energy Solutions	7
2. Baltic TRAM support for the Streamlining of Smart Specialisation.....	9
2.1. Baltic TRAM Support for Bioeconomy	9
2.2. Baltic TRAM Support for Blue Growth	10
3. Reflections on the Way Forward.....	11
4. Conclusions and Suggestions for Further Action.....	13
Bibliography	15
Annex: Overview of the Cases Processed During the Baltic TRAM Open Call.....	17



Executive Summary

Baltic TRAM Briefing Note 1/2019 “Baltic TRAM Smart Specialisation Trends” builds upon the earlier smart specialisation analysis produced during the project’s time frame. It captures in concise terms the added value brought by the implementation of three open calls for businesses in terms of offering further boost to such key EU initiatives as the EU Action Plan for the Circular Economy, the EU Maritime Security Strategy’s (EUMSS) Action Plan and the New Skills Agenda for Europe etc.

Via an exploration of specific cases the Baltic TRAM Briefing Note 1/2019 explains such additional benefits brought by the Baltic TRAM funded analytical research services as external quality check. Last but not least, the overview of Baltic TRAM spurred interactions between research and business sectors testify that the project is a good example how EU funded small-scale measures support goals set out across various thematic strategic frameworks, as well as offer further boost to the future jobs, which are crucial components for a successful continuous growth of the EU’s clean or green economy.

Introduction

This Briefing Note is presented as the last part of the overall delivery of the analysis of national roadmaps or research infrastructure, smart specialisation strategies (S3) and clusters, structured in the Baltic TRAM Activity 3.1. The analysis of smart specialisation insights generated by the open calls' are elaborated on the basis of those cases which offer most insights in terms of support for a wide spectrum of supportive frameworks and the EU goals.

The first part of the Briefing Note takes a stock of earlier Baltic TRAM produced analysis. The subsequent parts elaborate on certain nuances of specific cases. The conclusions are based on the earlier reflections and ambitions set for the project, as well as suggests a way forward for further development of required transnational actions to improve the future transnational innovation governance and tools implemented in the Baltic Sea Region.

1. Value of the Baltic TRAM Open Call's Results

The implementation of the Baltic TRAM open calls entailed an assessment of each of the processed research challenges, whether it was corresponding to any of the S3 specialisation fields. One important enabling factor for creating a common reference point for all representatives of the Industrial Research Centres (IRECs) in the identification of S3 trends was an earlier joint engagement in mapping the national S3 and innovation trends (Mickus et al., 2017). It was one of the steps taken towards building a wider awareness among regions about similar specialisations, which could serve as a basis for future potential partnerships (Hegyi & Rakhmatullin, 2017, p. 21).

To clarify the assumptions on which this Baltic TRAM Briefing Note is being built, the assessment of adherence to a S3 strand or absence to such adherence was performed by each of the representatives of the IRECs who prepared the report on the specific case. The results documented in 30 cases show that almost two thirds (19 cases) of the results were either explicitly or to a certain extent supporting specific S3 areas spanning across a wide spectrum of domains.

None of the S3 strands were overwhelmingly pronounced in the overall pool of 30 cases. Thus, Baltic TRAM limited insight about the science-business cooperation developments in the Baltic Sea Region does not mirror the earlier mapping conclusions with a distinct prioritisation of health sector and biotech in pharmaceuticals, digital growth and ICT as well as sustainable energy (Mickus et al., 2017, p. 30). However, the Baltic TRAM generated pool of cases shows that the three prioritised areas are supported by specific collaborative engagements and there is a considerable demand of R&D intensive services on the business side in the areas prioritised by the policy-makers, planners and executive agencies. Such demand is witnessed among several companies which are already familiar with certain EU support measures and funding programmes.

1.1 Support for the Pharmaceutical Companies

Some examples testify to the business demand for R&D solutions in the **medical sector**. For example, the Baltic TRAM case report 5¹ informs about measurements offered by the University of Turku to explore certain solutions for the manufacturing of pharmaceutical equipment.

The Baltic TRAM case report 29 on support offered to JSC Aconitum, manufacturing and marketing company of prescription drugs and over-the-counter medicines and food supplements.² JSC Aconitum is one of the leading pharmaceutical manufacturers in the Baltic countries (Estonia, Latvia and Lithuania). The company has developed with a substantial support from the EU Structural Funds (MITA, 2014, p. 94). JSC Aconitum has a solid track record of a forward looking development mirrored by its manufacturing plant with 70% of the required energy “obtained from renewable energy sources” (MITA, 2014, p. 94). The company has earlier received recognition as an awardee of the Baltic Innovation Prize 2012 presented by the Baltic Assembly (Baltic Assembly, 2019), as well as fifteen of its products being recognised as the Lithuanian Product of the Year with an award of a Gold Medal (MITA, 2014, p. 94). Baltic TRAM allowed to extend the innovative orientation of the company. Due to the active outreach of the IReC based in the Kaunas Science and Technology Park, Vytautas Magnus University offered to JSC Aconitum tailored support services to determine the amount of active ingredients in the newly developed food supplements.³

1.2. Support for the Sustainable Energy Solutions

Sustainable energy was promoted via specific practical steps taken by a number of IReCs across the Baltic Sea Region to meet the specific needs of the small- and medium-sized enterprises (SMEs).

The IReC housed by the University of Tartu succeeded in liaising the Tallinn University of Technology with a company interested in finding out thermal insulation properties in order to determine the optimal structure of a product. Consequently, as reported in the Baltic TRAM case study 1⁴, the Baltic TRAM funded measurements allowed to optimise the re-use of old paper as thermal insulation resulting in significant savings and support for the development of green economy. It is one of the practical examples how the ideas and suggestions enshrined in the **EU Action Plan for the Circular Economy** are being implemented. The reference

¹ Case report 5 on the Baltic TRAM open portal: <https://opendataportal.utu.fi/record/case-study-index-5>

² <https://edb.verslilietuva.lt/profile/756>

³ Case report 29 on the Baltic TRAM open portal: <https://opendataportal.utu.fi/record/case-study-index-29>

⁴ Case report 1 on the Baltic TRAM open portal: <https://opendataportal.utu.fi/record/case-study-index-1>



is made to the Action Plan's call to rethink the ways of producing and consuming, and to "transform waste into high value-added products" exploring among others the R&I funding opportunities offered by the Cohesion Policy (European Commission, 2015, p. 18).

LIACON GmbH is a young company based in Germany that develops and produces demanding products in the field of energy storage. Due to the outreach of the IReC hosted by DESY, LIACON benefited from the measurements performed by rhd instruments GmbH & Co, which helped to explore the temperature-dependent performance and viability of battery cells. This is one of the best Baltic TRAM generated examples of a tangible support offered to a company committed to ecologically driven businesses in the EU in a field, which is expected to have a crucial role in the evolution of the renewable energy industry (European Political Strategy Centre, 2018, p. 4). Thus, the Baltic TRAM generated results are contributing to the small yet cumulative steps aimed at implementing the **Energy Union**.

Sol Navitas, founded in 2009, specialising in solar panel production and instalment based in Tallinn. As it is shown in more detail in the Baltic TRAM case study 24,⁵ "the company was looking for a certified service provider able to study the performance of solar thermal air panel". The company found out about the network of IReCs offered services during a meeting organised at the Tallinn Science Park Tehnopol and subsequently received services from the TestLab Solar Thermal Systems, Fraunhofer Institute for Solar Energy Systems based in Germany. The reason why this specific case is worth being presented in greater detail is because the transnational selection of the best analytical research services did not help only to indicate to the company the best niche service provider. Additionally, the provided analytical research services offered analysis also served as an **external quality control measure** of the performance of the solar thermal air panel.

Most of the Baltic TRAM processed research challenges, which had a certain or pronounced degree of relation to S3 were ad-hoc encounters, which did not immediately result in a subsequent cooperation between the analytical research facility and the business entity. Thus, Baltic TRAM experience mirrors the overall trend that in most cases a similar support to a voucher-type of publicly funded offer of services might show some subsequent R&D oriented developments in a longer period of time, not within one to six months after the publicly financed encounter. Nevertheless, the outlier is the Baltic TRAM facilitated cooperation between Vytautas Magnus University and JSC Aconitum, facilitated by Kaunas Science and Technology Park, which has resulted in a follow-up cooperation in January 2019, a consecutive collaboration after the completion of the Baltic TRAM funded measurements in the end of 2018.

⁵ Case report 24 on the Baltic TRAM open portal: <https://opendataportal.utu.fi/record/case-study-index-24>

2. Baltic TRAM support for the Streamlining of Smart Specialisation

As it has been shown throughout Baltic TRAM's earlier analysis smart specialisation bears relevance across a number of EU strategic frameworks (Šime, 2017a). The results generated in terms of practical cooperation between research and business sectors support the earlier policy mapping's general conclusions about such cross-cutting ties. However, in nuanced terms, Baltic TRAM open calls demonstrate more ties to additional strategic frameworks than those earlier identified in the report "Multi-Level Governance of Innovation and Smart Specialisation".

One reason for such differences in the earlier desktop research and the analysis of Baltic TRAM open call can be explained by the fact that certain strategic initiatives or their updated variants were not existing at the time of preparation of the report "Multi-Level Governance of Innovation and Smart Specialisation". Such is the case of the EU Bioeconomy Strategy, which came into the policy-makers' spotlight in 2018 when the updated edition was published with an aim "to accelerate the deployment of a sustainable European bioeconomy so as to maximise its contribution towards the 2030 Agenda and its Sustainable Development Goals (SDGs), as well as the Paris Agreement" (European Commission, 2019). The pronounced focus on the SDGs makes it also of a particular interest to the CBSS and its focus on exploring the SDGs' angles of science and research cooperation.

In addition, it should be also taken into consideration that such frameworks as the EU Bioeconomy Strategy were also captured in a more comprehensive initiative included in the Baltic TRAM mapping exercise. EU Action for Sustainability, as explained in the Commission's Working Document, presumes that the EU Bioeconomy Strategy is contributing to the EU aspirations in implementing Sustainable Development Goal 13 "Take urgent action to combat climate change and its impacts" (European Commission, 2016, p. 49).

Last but not least, other strategic frameworks were seen as being less of an immediate relevance to the Baltic TRAM work at the initial phases of the project's implementation.

To give a better insight on these nuances the subsequent paragraphs elaborate on specific Baltic TRAM open calls' cases.

2.1. Baltic TRAM Support for Bioeconomy

The JSC Aconitum received services bears importance as a good example for continuous cooperation sparked by an initial publicly funded encounter. It is also one of those small-scale activities, which help to build up a wider critical mass of efforts bringing the overall goals of the **EU Bioeconomy Strategy** to life (besides its core supporting 14 actions planned to be launched this year). These remarks are conveyed with full awareness that the EU current understanding of bioeconomy is to a certain extent restrictive since it does not cover the JSC Aconitum represented area – health biotechnology and biobased medicines (European Commission, 2018, p. 27). However, the overall aim here is not to strictly classify the Baltic TRAM open

calls' cases as corresponding to one or another exact category of an EU strategy or framework action. The goal is to show what limited yet cumulative effect Baltic TRAM generated research-business cooperation is bringing to strengthen the implementation of the goals set EU-wide.

Another example of Baltic TRAM engagement with an SME related to the bioeconomy area is analytical measurements offered to NutriLoop (Baltic TRAM case study 31⁶). The company aims at changing the current waste system in order to depart from bio-waste being treated like a problem and instead treating bio-waste as a solution for organic farming.⁷ NutriLoop had earlier identified a list of research tasks which need to be accomplished in order to prepare its produced compost pellets for an introduction to the market. Baltic TRAM funded measurements were a clear component in a broader plan envisaged for the preparation of a product for the market.

2.2. Baltic TRAM Support for Blue Growth

Turku-based Renotech R&D acquired DESY analytical research services via Baltic TRAM IReC hosted by the University of Turku (Baltic TRAM case study 15⁸), which helped to develop an industrial production model of an ash modification for cement manufacturing (Baltic TRAM, 2018). Renotech R&D works for the maritime industry, thus Baltic TRAM offered services were strengthening the overall goals of EU's **blue growth**, as well as the smart specialisation component of the **EU Maritime Security Strategy's** (EUMSS) Action Plan (2014).⁹ Renotech R&D acquired services is a good example how the Cohesion Policy funds are supporting locally (in other words, at the Smart Chemistry Park of Turku Science Park) identified needs to acquire the best R&D support available in the Baltic Sea Region. Namely, a Finnish SME via a Turku-based IReC was able to acquire publicly financed and transnationally selected analytical research services from a Hamburg-based facility.

Similarly, as it was argued earlier, it is another good case presenting the cross-cutting limited yet cumulative benefits produced by projects which are primarily grounded in the Cohesion Policy, but at the same time support certain goals of strategic frameworks steered by other Directorates-General of the European Commission.

⁶ Case report 31 on the Baltic TRAM open portal: <https://opendataportal.utu.fi/record/case-study-index-31>

⁷ <https://www.linkedin.com/company/nutriloop>

⁸ Case report 15 on the Baltic TRAM open portal: <https://opendataportal.utu.fi/record/case-study-index-15>

⁹ References to 3.1.10. of the EUMSS: "Identify specific future strategic technological challenges and build capacities to meet them via innovation, R&D and standardization taking into due account the European Strategic Cluster Partnership, the Enterprise European Network and the promotion of regional networking to integrate industrial and research assets related to maritime security into regional smart specialization strategies."

3. Reflections on the Way Forward

Due to the fact that Baltic TRAM open calls did not entail an acquisition of detailed data, which would support immediate requirements for a longitudinal analysis of the R&D processes undertaken by each of the SMEs with which the consortium collaborated during the three open calls, the earlier ambition to explore emerging industries or emerging technologies (Šime & Legzdīņš, 2018, p. 61) is not attained. Such an analysis would require a more in-depth examination of the evolution of the relevant value chains, including the potential reconfiguration of former value chains within a longer period of time.

The customer survey executed in 2018 in the scope of the work of the Baltic TRAM Work Package 4¹⁰ shows that there is plenty of room for in-depth exploration in this regard, since more than 20 of the businesses engaged in the Baltic TRAM open call have earlier used university research services, 14 SMEs have used other public research organisation services, 15 SMEs have profited from the expertise of commercial laboratories. However, within the scope of Baltic TRAM project interviews with the representatives of the SMEs and arrangements for a much more detailed examination how the Baltic TRAM funded measurements fit within a wider incremental process of R&D of each SME were not conducted, but should be kept in mind as a potential follow-up activity in the post-project phase, once the full set of open call cases will be collected, also made available on the Baltic TRAM open data portal.

Such subsequent examination holds the value to present further nuances to the policy makers and policy planners what role the EU-funded or co-financed measures play in advancing the competitiveness of the EU-based businesses. This is an echo of the earlier remarks that a purely mechanical “more of the same” approach might not pave the most promising way for unlocking the full potential or the European research capacities to support the EU-based SMEs (Chaniotou & Šime, 2018, p. 250), such in-depth analysis might offer further inspiration how to tailor the next generation support programmes in sync with the current realities faced by the SMEs and their particularities without posing potential risks of a market distortion.

In addition, the suggested examination might also be beneficial in view of the earlier raised importance to preserve a strategic focus in the development of new project ideas (Hegyí & Rakhmatullin, 2017, p. 21). It is a factor highlighted also in order not to be carried away with technical receptiveness or orientation simply on the absorption of the public funding, e.g., with a focus on the Interreg Baltic Sea Region Programme’s plans for the future calls for applications. This is an invitation to reflect on the two types of stimulus – demand driven (business needs) and the offer driven

¹⁰ Baltic TRAM IReC Customer Pre-Survey as of 10 Dec 2018 organised by Sari Stenvall-Virtanen, Baltic TRAM Work Package 4 Leader (e-mail: sarsten@utu.fi). Responses to the question “10. Please, specify what kind of research services you have used before (You can select more than one option)”.

(open calls to acquire public funding) – present in the transnational cooperation. A counterbalance of independent (from the main funding source) strategic planning is crucial to ensure that the exerted activities reach a cumulative impact with certain long-term implications to the competitiveness of the businesses based in the Baltic Sea Region. This paragraph demonstrates that Baltic TRAM has sparked further reflections on how to best balance technical project planning and smooth management requirements with the thematic focus on targeting in the best tailored way the existing challenges, which prevent SMEs from being even more competitive in various markets.

With this Baltic TRAM Briefing Note, there is a certain tiny step already taken in order to deviate from the widespread approach to present “inventory-like descriptions of regional systems, with a tendency to focus on a static landscape of actors and institutions” (Tripl, Asheim, & Miörner, 2014, p. 8). Instead during the Baltic TRAM implementation such initial exploration, structured in the deliverables of the Baltic TRAM Work Packages 3¹¹ & 4¹², is coupled with a follow-up examination, which would outline whether the developments unleashed by the project correspond to certain trends and goals enshrined in the framework policies and their implementation programmes. Further in-depth analysis of the generated business cases might be of value also in light of the expert interest in exploring the factors behind a successful implementation of a path renewal. Baltic TRAM acquired cases, which were processed transnationally, can be examined along the lines of earlier discussed potential triggering of path renewal “by the inflow of non-local knowledge and its combination with highly specialised assets available within the region” (Tripl et al., 2014, p. 10). Such analysis would require an examination of several R&D stages taken by an SME, not just the one funded by Baltic TRAM.

Last but not least, due to the Baltic TRAM ensured support actions for the EU Action Plan for the Circular Economy and the EU Bioeconomy Strategy the project has in a certain way contributed to the maintenance and putting in practice of the skills corresponding either to the so-called “**green economy**” (European Commission, 2015, pp. 19-20) or “**clean economy**” (European Political Strategy Centre, 2018, p. 8). Baltic TRAM is not part of the **New Skills Agenda for Europe**, but that does not mean that the project has no relevance to the overarching goals of this initiative. Baltic TRAM thus supports the maintenance and honing of skills, which offer certain prospects in the future job market.

¹¹Namely, 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” (Mickus et al., 2017); Swedish Innovation and Smart Specialisation Governance in the Baltic Sea Region's Context (Šime, 2017b); Multi-Level Governance of Innovation and Smart Specialisation (Šime, 2017a).

¹² Namely, Review on regional resources and further development of Analytical Research Infrastructures - Regional maps of science and business collaboration networks (Stenvall-virtanen, 2018); Review on regional resources and further development of Analytical Research Infrastructures - Needs and Potential for macro-regional cooperation (Stenvall-virtanen, 2018).

4. Conclusions and Suggestions for Further Action

- 4.1. Further insight for the Policy Area Innovation of the EU Strategy for the Baltic Sea Region should be elaborated:** Bearing in mind the earlier potential outlined in the smart specialisation literature (Hegyi & Rakhmatullin, 2017, p. 7), Baltic TRAM open calls have generated some insight in the role of macro-regional networks and their nascent potential to provide some food for thought how to model the future transnational collaboration in order to draft sound and impactful transnational joint strategies of innovation. This remark bears the most relevance to the on-going reflections on the future role of the Policy Area Innovation of the EU Strategy for the Baltic Sea Region (EUSBSR) since Baltic TRAM is part of the Baltic Science Link flagship. However, the pre-condition for exploiting this potential would be a further in-depth examination of at least some of the Baltic TRAM open cases.
- 4.2. Cross-cutting support for various European initiatives:** Baltic TRAM is a good example how small-scale transnational joint activities can contribute to the amassing of the overall European efforts to reach the goals and milestones enshrined in a number of EU-level strategies and action plans. Such cumulative effect is a good example of the cross-cutting character of transnational efforts and can serve in future as microcosms to acquire some lessons learnt. However, due to the compact scope of such projects as Baltic TRAM, no far-fetched conclusions should be drawn from its activities about the overall macro-regional innovation ecosystem. The obvious limitations (including the financial limitations reported by some IReCs¹³) of a claim that the results of the project might be showing the ultimate macro-regional innovation environment, its characteristics should be kept in mind. Otherwise, some erroneous transnational conclusions might be drawn on the basis of a too thin of a body of evidence and too little of a structured analysis of this evidence.
- 4.3. External quality control:** Baltic TRAM experience shows that its transnationally provided measurement services are also ensuring a quality control aspect in terms of the SMEs receiving analysis and assessment from experienced and highly qualified analytical research facilities.
- 4.4. Potential to serve as an impetus for closer transnational cooperation in specific specialisations:** Although it has not been stated explicitly by the IReCs engaged in the Baltic TRAM implementation, theoretically (Hegyi & Rakhmatullin, 2017, p. 21), the practical collaboration facilitated among a pool of actors from various parts of the Baltic Sea Region might generate some insight and spark ideas or initial hints about a potential for future cooperation with certain entities, which have a like-minded prioritised specialisation in addressing the pan-European challenges and development of value chains. The policy mapping exercise implemented by the Baltic TRAM consortium and Baltic TRAM High Level Group shows that there are strong commonalities

¹³ Reference to the financial resources allocated for the execution of measurements requested by the SMEs via the Baltic TRAM three calls for submissions.



among the prioritised thematic areas selected by various entities in the Baltic Sea Region.

- 4.5. Boost for the green or clean economy jobs:** Besides the much more overarching initiatives, such as the New Skills Agenda for Europe, Baltic TRAM has offered some practical or hands-on training or maintenance of skills which are crucial for the future job market and the fast growing green or clean economy markets. Thus, such projects as Baltic TRAM help to address the need to not only push forward sustainable transition and, in the circular economy's words, move towards closing the loop, but also to combine this development with appropriate training opportunities for the skill-sets required to compete for the jobs of the future. Such positive side-effect might be identified also among other similarly oriented innovation projects funded by Interreg programmes, but this remains to be explored and verified by the various project consortiums themselves.



Bibliography

Baltic Assembly. (2019). Baltic Innovation Prize. Retrieved February 8, 2019, from <http://www.baltasam.org/en/prizes/baltic-innovation-prize>

Baltic TRAM. (2018). Sustainable Cement Manufacturing. Baltic TRAM. Retrieved from https://www.baltic-tram.eu/sites/sites_custom/site_baltic-tram/content/e51325/e58779/e66904/e80847/SustainableCementManufacturing_eng.pdf

Chaniotou, N., & Šime, Z. (2018). Baltic Sea Region-wide Research-Business Cooperation: What Benefits For Sparsely Populated Areas and Smart Specialisation? *European Structural and Investment Funds Journal*, 6(3), 241–252. Retrieved from <https://estif.lexxion.eu/article/ESTIF/2018/3/7>

European Commission. Closing the Loop - An EU Action Plan for the Circular Economy (2015). Brussels. Retrieved from https://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_1&format=PDF

European Commission. Commission Staff Working Document Key European action supporting the 2030 Agenda and the Sustainable Development Goals (2016). Strasbourg. Retrieved from http://ec.europa.eu/europeaid/sites/devco/files/swd-key-european-actions-2030-agenda-sdgs-390-20161122_en.pdf

European Commission. (2018). *A Sustainable Bioeconomy for Europe: Strengthening the Connection Between Economy, Society and the Environment. Updated Bioeconomy Strategy*. Publications Office of the European Union. Retrieved from https://ec.europa.eu/research/bioeconomy/pdf/ec_bioeconomy_strategy_2018.pdf#view=fit&pagemode=none

European Commission. (2019). The Bioeconomy Strategy. Retrieved February 4, 2019, from <https://ec.europa.eu/research/bioeconomy/index.cfm?pg=policy&lib=strategy>

European Political Strategy Centre. (2018). *10 Trends Climate and Energy*. Retrieved from https://ec.europa.eu/epsc/publications/other-publications/10-trends-reshaping-climate-and-energy_en

European Union Maritime Security Strategy - Action Plan (2014). Brussels. Retrieved from http://ec.europa.eu/maritimeaffairs/policy/maritime-security/doc/20141216-action-plan_en.pdf

Hegyí, F. B., & Rakhmatullin, R. (2017). *Implementing smart specialisation -thematic platform on industrial modernisation. S3 Policy Brief Series*. Luxembourg: Publications Office of the European Union. <http://doi.org/10.2760/312534>

- Mickus, A., Jēkabsons, I., Muižniece, L., Chaniotou, N., Szmigielski, P., Stenvall-Virtanen, S., ... Šime, Z. (2017). *National innovation and smart specialisation governance in the Baltic Sea region: Laying grounds for an enhanced macro-regional science-business cooperation* (4/2017). (Z. Šime, Ed.). Centrum Balticum Foundation. Retrieved from <http://s3platform.jrc.ec.europa.eu/-/data-infrastructures-in-support-of-macro-regional-development?inheritRedirect=true>
- MITA. (2014). *Innovative Lithuania 2014*. (L. Ažubalis, Ed.). Vilnius: Agency for Science, Innovation and Technology (MITA). Retrieved from https://mita.lrv.lt/uploads/mita/documents/files/leidiniai/Innovative_Lithuania_2014.pdf
- Šime, Z. (2017a). *Multi-Level Governance of Innovation and Smart Specialisation*. Retrieved from <http://s3platform.jrc.ec.europa.eu/-/multi-level-governance-of-innovation-and-smart-specialisation?inheritRedirect=true&redirect=%2Fs3-in-baltic-sea-region>
- Šime, Z. (2017b). *Swedish Innovation and Smart Specialisation Governance in the Baltic Sea Region's Context: Towards an Enhanced Macro-Regional Science-Business Cooperation*. Retrieved from https://www.baltic-tram.eu/newsroom/press_releases/baltic_tram_latest_findings_on_the_bsr_wide_smart_specialisation_trends/index_eng.html
- Šime, Z., & Legzdīņš, M. (2018). Research and Higher Education Cooperation in the Baltic Sea Region. *Latvijas Intereses Eiropas Savienībā*, 1(March), 45–65. Retrieved from http://www.mfa.gov.lv/images/ES/Sabiedribas_Informesana_ES_jaut/ES_2018_1_netam.pdf
- Stenvall-virtanen, S. (2018). *Review on regional resources and further development of Analytical Research Infrastructures - Needs and Potential for macro-regional cooperation*. Baltic TRAM. Retrieved from https://www.baltic-tram.eu/newsroom/press_releases/latest_insights_on_analytical_research_infrastructures/index_eng.html
- Trippl, M., Asheim, B., & Miörner, J. (2014). Regions with Less Developed Research and Innovation Systems, 1–22. Retrieved from https://orca.cf.ac.uk/78223/1/Identification_of_regions_with_less_developed_research_and_innovation_systems.pdf

Annex: Overview of the Cases Processed During the Baltic TRAM Open Call

Index of the case ¹⁴ & (if available) name of the SME	RI(/-s) / ARF(/-s) involved in offering measurement services	Support to S3 ¹⁵	NACE & industry & level of technological intensity ¹⁶	Additional remarks (if needed)
1	Tallinn University of Technology	yes	C23.9.9.; thermal insulation products for construction; medium-low-tech	The industry is somewhat related to the RIS3 topic of “more efficient use of resources”. The re-use of old paper as thermal insulation.
2	University of Tartu	yes	M72.1.9; nanofibre composite production; high-tech	The industry itself is somewhat related to the RIS3 topic of “more efficient use of resources”, as the nanomaterial gives significant advantages to the mechanical properties of certain resin systems. There was no explicit relation to industrial renewal or KET applications.
3	Tallinn University of Technology	yes	C22.2.1; manufacture of plastic plates, sheets, tubes and profiles; medium-low-tech	The industry itself is related to the RIS3 topic of “more efficient use of resources”, as the re-use of such material gives cost advantages to the economy in Estonia. No direct connection to KET.
4	University of Tartu	no	C23.4.9; manufacture of	

¹⁴ As indicated in the Baltic TRAM Open Data Portal: <https://opendataportal.utu.fi/experiments>

¹⁵ The information listed on the adherence or lack of adherence to the regional smart specialisation strategies is based on the assessment presented by the Industrial Research Centres in their case analysis reports. However, this assessment has not been a subject of a peer review.

¹⁶ Reference source: https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:High-tech_classification_of_manufacturing_industries & https://ec.europa.eu/eurostat/cache/metadata/Annexes/htec_esms_an3.pdf

			other ceramic products; medium-low-tech	
5	University of Turku	yes	C21.20; manufacture of pharmaceutical preparations; high-tech	Company is manufacturing pharmaceutical equipment, which links these pilot studies to the regional interest on medical technologies.
6	Institute of Physics, Polish Academy of Sciences	no	M72.19; Other research and experimental development on natural sciences and engineering; high-tech	The range of the research as well as the cosmetics sector is out of the RIS3 and KET for Świętokrzyskie Region.
7	Material Science Institute of the Kaunas University of Technology	yes	C26.40; manufacture of consumer electronics; high-tech	RIS3 priority “New production processes, materials and technologies”
8	Finnish National Institute of Health & Welfare	no	C32.30; manufacturing of sporting goods; low-tech	
9	University of Oulu, Seilab Oy	no	C10.30; processing and preserving of fruit and vegetables; low-tech	
10	University of Oulu, Seilab Oy	no	C10.30; processing and preserving of fruit and vegetables; low-tech	
11	University of Oulu, Seilab Oy	no	C10.30; processing and preserving of fruit and vegetables; low-tech	

12	TÜV Eesti OÜ	yes	C23.99.; medium-low-tech	The industry is somewhat related to the RIS3 topic of "More efficient use of resources", as the re-use of old paper as thermal insulation gives significant savings to the overall green economy.
13	Tallinn University	yes	C32.99; Other manufacturing; low-tech	The experiments were somewhat related to RIS3 topic of "Enhancement of Resources" as company plans to use naturally produced lake mud in their products.
14	Institute of Physics, Polish Academy of Sciences	yes	M72.19; Other research and experimental development on natural sciences and engineering	The chemical sector is identified in the RIS3 as one of the most important in Mazowieckie Region.
15	University of Turku, DESY PETRA III	yes	C23.49; manufacture of other ceramic products; medium-low tech	The company works in the field of construction, fire safety and decoration. They are a subcontractor for marine industry. The studied samples are manufactured by this company from recycled materials. This case matches with: Blue growth industries and Environmental industries.
16	University of Turku	yes	F43.39; other building completion and finishing	Company is a subcontractor of the regional marine industry. As a result, these pilot studies are linked to regional interest in blue growth.
17	Institute of Physics, Polish Academy of Science	yes	C28.93; manufacture of machinery for food, beverage and tobacco processing;	The experiment is directly linked to the one of Malopolskie smart specialisations which is electrical engineering and machine industry.

			medium-high tech	
18	University of Tartu	yes	B08.1; quarrying of stone, sand and clay	Innovative food chains, as part of the Western Finland RIS3, is a relevant concept to this experiment. This company has a plan to start production of drinkable clay in the near future.
19	rhd instruments GmbH & Co	yes	C27.20; manufacture of batteries and accumulators; medium-high tech	Electrical equipment, other power and storage technologies, advanced materials, sustainable energy and renewables.
20	University of Latvia	no	A01.13; growing of vegetables and melons, roots and tubers; [not available]	
21	Eurofins Environment Testing Estonia OÜ	yes	C10.73; manufacture of macaroni, noodles, couscous and similar farinaceous products; low-tech	There is a small connection to Estonian RIS3 priority “more efficient use of resources”.
22	Material Science Institute of the Kaunas University of Technology	yes	C26.40; manufacture of consumer electronics; high-tech	RIS3 priority “New production processes, materials and technologies”
23	Aalborg University	no	M71.20; technical testing and analysis; high-tech	
24	TestLab Solar Thermal Systems, Fraunhofer Institute for	no	D35.30 Steam and air conditioning supply	

	Solar Energy Systems			
25	Products Research Division, Fire Research Centre, Fire and Rescue Department, Ministry of Interior of Lithuania	yes	C20.30 Manufacture of paints, varnishes and similar coatings, printing ink and mastics	A weak connection to the Estonian RIS3 priority "more efficient use of resources".
26	Eurofins Environment Testing Estonia OÜ	yes	C20.30 Manufacture of paints, varnishes and similar coatings, printing ink and mastics	A weak connection to the Estonian RIS3 priority "more efficient use of resources".
27	University of Turku	no	C22.29 Manufacture of other plastic products	
28	University of Turku	no	C25.61 - Treatment and coating of metals	
29	Vytautas Magnus University	yes	C21 Manufacture of basic pharmaceutical products and pharmaceutical preparations	Measurements are related with national RIS3 priority "Health technologies and biotechnologies".
30	Vytautas Magnus University	yes	M72 Scientific research and development	Measurements are related with national RIS3 priority "Health technologies and biotechnologies".
31	Centre of Food and Fermentation Technologies	no	G 47.91 Retail sale via mail order houses or via Internet	No direct connection to Estonian RIS3. The work belongs to the development of sustainable bio-based economy.