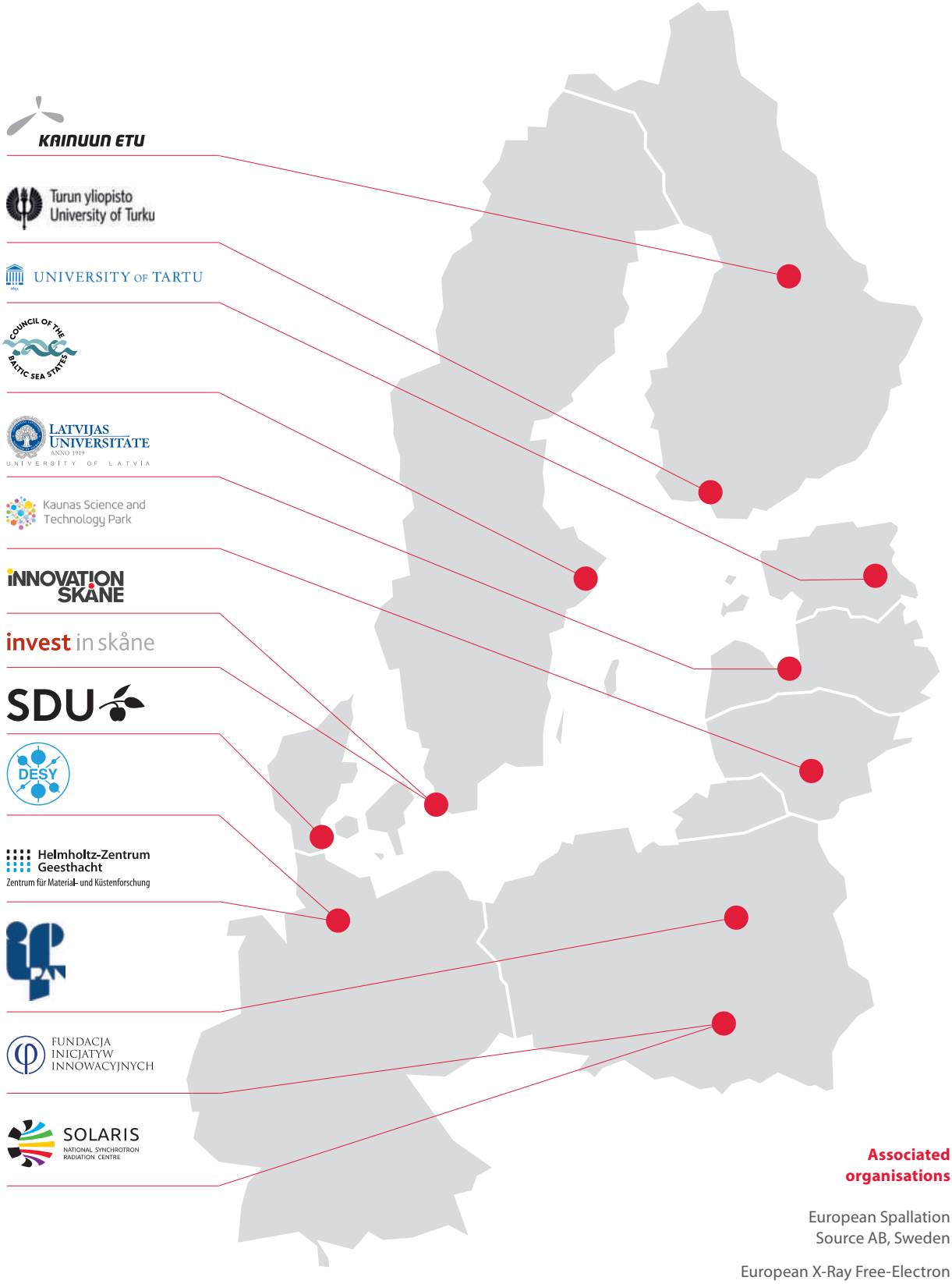
A splendid journey through the troubled waters between science and economics

RESEARCH *for* BUSINESS

BALTIC TRAM



Associated organisations

European Spallation Source AB, Sweden

European X-Ray Free-Electron Laser Facility GmbH, Germany

Semiconductor Physics Institute Center for Physical Sciences and Technology, Lithuania

STRING Partnership, Denmark

Baltic Sea Parliamentary Conference (BSPC)

Baltic TRAM Research for Business

Baltic TRAM – What is it about?

What?

Baltic TRAM (Transnational Research Access in the Macroregion*) strengthens the relationship between analytical research institutions and businesses by fostering cooperation between companies and researchers, linking expertise to concrete industrial needs. Project partners introduce companies to national Industrial Research Centres (IReCs), which serve as interfaces between analytical research infrastructures and companies.

Why?

The overall objective is boosting innovation and encouraging entrepreneurship through establishing a cooperation structure between researchers and companies at national, regional, and international levels. This contributes to the regional efforts of making the Baltic Sea Region innovative, sustainable, and competitive. The national Industrial Research Centres (IReCs) were our chosen instruments for facilitating this cooperation.

How?

Companies based in the EU member states are eligible to apply for a consultation with experts at analytical research facilities in order to find solutions to a concrete challenge concerning their product portfolio. All types and sizes of laboratories, or large facilities such as synchrotrons, throughout the Baltic Sea Region offer their expertise. Companies have the opportunity to analyse material samples on a micro-, nano- or molecular scale.

Accountability?

All cases submitted by companies to Baltic TRAM are followed up, to verify general acceptance of the offered services, and to prove the suitability of dedicated Industrial Research Centres (IReCs) as facilitators of science and business cooperation.

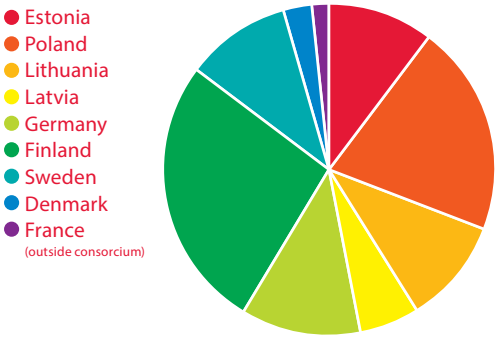
Where and who?

In line with its transnational character, the Baltic TRAM project consortium represents all EU member states in the Baltic Sea Region. It is led by DESY, Deutsches Elektronen-Synchrotron, in close dialogue with fourteen project partners and five associated organisations.

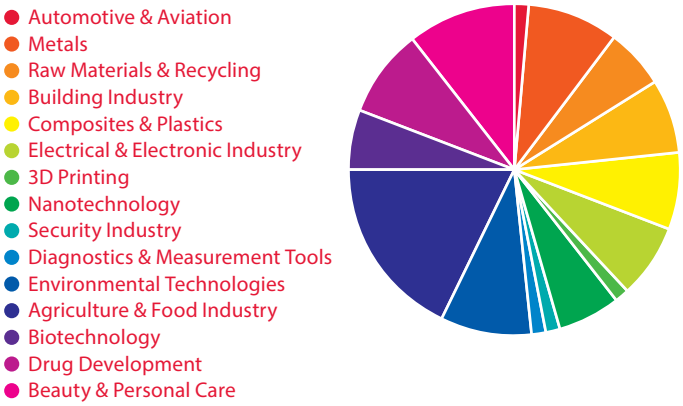
* **Baltic-TRAM (March 2016 – February 2019) is partly funded by the EU Interreg Baltic Sea Region Programme.**

Performance and

Applications per country



Applications broken down by sectors

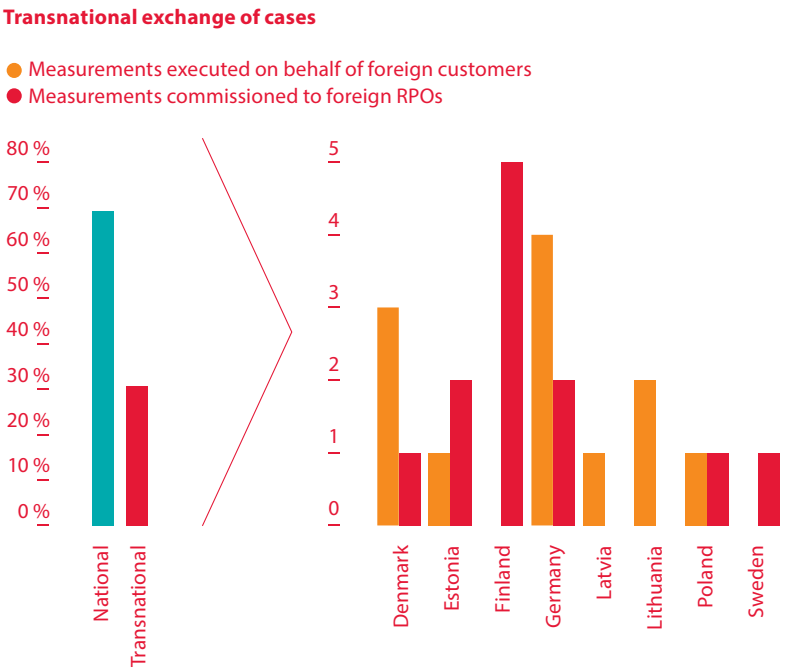


Three calls for applications for measurement services were sent out by the project partners, beginning in April 2016. **Industrial Research Centres (IReCs) from eight countries promoted this offer, and provided the cooperating companies with analytical research facilities**. Overall, Baltic TRAM received 68 applications, originating from across the entire Baltic Sea Region (with one exception coming from France). Remarkably, companies from the moderately innovative countries (according to the European Innovation Scoreboard 2018: Estonia, Latvia, Lithuania, Poland) submitted an equal number of applications as companies from countries with a higher innovation performance.

Around 94 % of successful applications were sent in by small and medium sized companies (SME < 250 employees), and around 6 % by large-scale enterprises. Micro companies, with ten or fewer employees, especially benefitted from our services, as the majority of requests stemmed from this group. Our services were particularly attractive, and evidently helpful, to this group of enterprises, as most of them are young start-ups with technology driven business models that profited greatly from the scientific expertise and measurements the Industrial Research Centres (IReCs) could arrange.

One of Baltic TRAM's major success factors was its cross-sectoral and cross-disciplinary nature; **we have met the demands of companies from a broad spectrum of the Baltic Sea Region's economy.** A wide range of sectors benefitted from the project, including drug development, 3-D-printing, the automotive and aviation industries, and biotechnology.

expertise counts!



Baltic TRAM offered the possibility of executing measurements on a local or national scale via co-operation with research performing organisations (RPOs) in the company's home country. However, if there was no matching laboratory or synchroton in the company's country of origin, transnational solutions were found. The IReCs gave assistance and redirected the companies' requests to foreign RPOs. Around one third of our cases were handled by our transnational expertise network. Consequently, around 70% of the companies' requests could be handled by regional competence. The bar charts above present this distribution of cases and the transnational exchange between countries.

Baltic TRAM has therefore been able to provide two benefits in terms of regional development effects:

- **We stimulated innovation and research intensity across the local, regional, and national research and business landscapes through guiding companies to RPOs.**
- **By "tapping" international expertise, we enabled knowledge transfer on a transregional and transnational scale.**

Our local and transnational network supports the aspirations of the European Research Area, and specifically strengthens the Baltic Sea Region. Looking at our cases' technical realisation, we can summarise that around 7 % of the research services were carried out by large analytical research infrastructures (more specifically, synchrotron radiation facilities). Therefore, the majority of the measuring services offered could be performed with lab-size-technologies.

Our conclusion is that the demand for measurement services is not understood well, and there is a hidden demand, which implies that businesses need to helped in gaining awareness of the characteristics of the materials they use. They need to constantly update their knowledge of these issues. For this reason, it is important to pursue the professionalisation of technology transfer services, focusing on measurements and analytical research, in our region.

Kainuun Etu Ltd., regional development company, Finland (project partner)

Kindling Enthusiasm and Innovation

Over the past decade, national policies like the German "Hightech-Strategie", and European initiatives like the Innovation Union, have shifted public funders' focus towards innovation. Support for co-operation and knowledge transfer between industry and science has become more and more important. The dynamic of innovation in industry should be boosted, in pace, number and level of maturity. Achieving this goal requires a holistic approach; and all the various actors of the innovation system need to be brought on board. Until now, many projects and instruments have been rather narrow in their scope, either focusing on one discipline, one branch or sector, or a single group of actors.

However, Baltic TRAM chose a different approach; **by establishing a dynamic workflow matching the client's needs with the most suitable scientific expertise, and offering access to a vast variety of analytical equipment, we were able to provide better and faster services for commercial customers.** This was possible only by choosing a trans-regional, cross-methodological, cross-institutional, cross-sectoral and cross-disciplinary approach, and by establishing a network of highly committed experts.

We act transregionally: by addressing regionally embedded companies, which have a well-established connection to their local clients, and connecting these companies to international expertise.

We act cross-methodologically: difficult challenges call for complex solutions facilitated through different analytical methods, experimental settings, and scientific knowledge. Through our network of IReCs, we are able to provide those solutions.

We act cross-institutionally & cross-sectorally: by working with different research infrastructures and laboratories, we combine all sorts of expertise for our clients. We strive to find satisfying solutions that can be applied to product and technology development in a cost-effective, cross-institutional manner. Our core competence – using all facets of natural science analytical methods and infrastructures – serves as a cross-sectoral aid for companies from many different sectors.

We act cross-disciplinarily: we moderate the entire process of solution seeking, starting with the formulation of a precise research question, finding the right experts and appropriate methods, and concluding with the delivery of the interpretation of the results. Cross-disciplinarity is at the heart of most innovation policies – we simply deliver it by being the "translator", not only between science and business, but also across disciplinary boundaries.

INTERREG projects should at best act as facilitators to overcome economic, social and territorial disparities in Europe. By bringing together companies and scientists across the BSR, Baltic TRAM served exactly these key goals.

Kaarina Williams, German Member of the Monitoring Committee of the Interreg Baltic Sea Region Programme

Better understanding of nanofiber distribution has led to new products

Success Story I

Why did the company need an experiment?

We were searching for the opportunity to carry out specific measurements and analyses that were needed for the further development of the company's new potential products.

Did the experiment provide information that affected the development process?

All of the work on the experiment, and the quality of the results, fully met our expectations and helped in understanding the next steps for the product R&D.

Has the company entered into dialogue with Industrial Research Centers (IReCs)?

The theoretical background regarding the measurements was provided by the IReC. Furthermore, several meetings with IReC researchers helped us to gain a better understanding of the topic.

How did it benefit the company?

The company was able to continue product development of multiple new products by getting factual information about the nano-scale distribution of nanofibres, and the structure of the resin, in the five sample materials. The company was then able to find a local partner to continue their product development with, and to better understand the effects of surface functionalisation and different components in the resin system.

Aleksei Tretjakov, Project Coordinator,
ANF Development, Tallinn, Estonia

As a SME, Nano-Join GmbH is not able to own all the important machinery and carry out all the needed analytics by itself. It was really helpful, therefore, to get access to needed measurements through Baltic TRAM. From the start, we had a very good process and competent contacts with our project partner, SDU, who gave us all the information we needed to realise further development steps. Thus, in the end, the project was very successful for us.

Dr. Adrian Stelzer, CTO Nano-Join GmbH, Germany

What we have learned

The key message emerging from the three open campaigns during Baltic TRAM's operational phase is the clear response of commercial companies to these calls, which manifested as a higher number of applications than expected. Thus, there is proof of the need for supportive activities, and that the concept we have developed is functional.

The submitted applications show that **the need for support extends across all technical sectors.** However, the strong demand from many different sectors requires an equally **wide range of scientific expertise and analytical-technical measurement options.** This can only be realised in an international network, in which partners covering a broad range of skills and expertise support each other.

Of course, such a network depends very much on the quantity and quality of local/regional contact points. However, as shown by different responses in individual countries, success often also depends on the intensity with which clients are approached. Many years of trust in institutions or persons may also play an important role here.

Most of the measurements were carried out locally/regionally, but in **about 1/3 of all cases, cross-border cooperation was needed from the project partners' network.** Reasons for this were, as examples, the need to use special measuring methods or devices (synchrotron), the need to overcome bottlenecks in short-term availability, or to achieve significant cost reductions.

More than 2/3 of the cases dealt with in Baltic TRAM were submitted by micro enterprises with fewer than 10 employees. For this group, especially, what **Baltic TRAM offers seems to be very attractive.** The reason for this is probably that because of their low staff and capital resources, micro-SMEs are usually unable to secure long-term retention of human and financial resources in research collaborations. Unfortunately, most of the existing support programmes are geared towards long-term cooperation. Ad hoc activities are usually excluded.

In order to boost innovation we need to bring together all relevant actors of the system: from regionally rooted universities with their labs to internationally renowned big analytical research infrastructures, from micro companies in small villages to huge international market leaders in urban metropolises. Innovation is needed for prosperity, job security and equal opportunities in Europe. This is what Baltic TRAM is all about!

Uwe Sassenberg, Deutsches Elektronen Synchrotron (DESY), Germany (project coordinator)

Idea of using a side flow material reinforced and tailored to new products

Success Story II

What did we do?

The main focus of the experiment was finding out the possibilities of using a side flow material from stone cutting and handling to create a new product. Through the experiment, we gained essential knowledge about the composition of the material.

How did it benefit the company?

We already had the idea of using side flow materials for certain products, and our knowledge was reinforced and proved by the experiment's findings. The analytical research centre involved followed up the measurements by providing assistance in interpreting the results.

We received important support for kicking off the product development. For a micro company like us, the start of a new product development process is a big challenge! Consequently, support for initial measurements and a feasibility study is of high value.

What is the next step?

Currently, we are exploring the possibilities of using the material to create new products, in cooperation with industrial partners. Baltic TRAM is holding follow up sessions with us, with the aim of timely identifying possible support needs.

The grass is not always greener on the other side, unfortunately … the challenges to improving cooperation between science and industry are the same, more or less, in Germany, Sweden, and Latvia. On one side, we learned a negative lesson, because there was little hope that being integrated into an international network would solve most of our challenges. On the other side, we learned positive lessons, because there is a big stimulus for continuing cooperation and to try to find joint solutions to these questions: How do we initiate real dialogue between science and industry? Which is the better marketing tool to approach industry representitives with – individual contacts or special events for the target audience?

Matiss Neimanis, University of Latvia (project partner)

What needs to be done now …

The lessons we learned during Baltic TRAM lead to three tools that can effectively strengthen cooperation between companies and scientists across Europe, and thus give innovation a boost:

Provision of Research Vouchers

In all cases where companies seek only short-term scientific support to solve analytical challenges, **Research Vouchers** at the national or European level are the perfect solution. This policy instrument could facilitate the financial support for research services by covering a certain percentage of the actual costs, depending on the applicant company. Research vouchers allow for sharing the costs of "knowledge and technology transfer" between public and private parties. We believe adopting this instrument to the needs of micro companies would greatly aid them in realising their ideas.

Support for regional one-stop-offices

The staff at our Industrial Research Centres (IReCs) acted as translators and matchmakers between companies with research challenges, and research providers. We believe that support for dedicated spin-offs at analytical service institutions, or internal solutions e.g. a specialised unit within a research performing organisation, is absolutely crucial to bridging the gap between research and business. These **local offices** should provide solid and ongoing support for the supply and demand side of research, and act as a **one-stop-shop** for companies with research challenges, by combining technological expertise with a hands-on business spirit.

Support of a European wide Network

We need a **Europe-wide network** that connects the enthusiasm and expertise of local partners, the IReCs. Through cooperating within a network, we can speed up idea to market innovation processes, and find the perfect match between companies and research providers by acting transnationally. This kind of network will deliver benefits, not only for all sizes of companies, but also by enabling Research Performing Organisations to better accomplish their commitment to connecting science and society, for the welfare of all.

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BALTIC TRAM

Interreg Baltic Sea Region

EUROPEAN UNION

EUROPEAN REGIONAL DEVELOPMENT FUND