

Enhancing the efficiency of the cooperation between business and science

The case for more mission-oriented science, technology and innovation policy in Lithuania

Introduction

This policy briefing is based on a study undertaken from December 2019 to December 2020 by the European Future Innovation System (EFIS) Centre and Visionary Analytics under a contract awarded by the European Commission's Directorate General for Structural Reform Support (DG REFORM). The work sought to inform the design and implementation of science, technology and innovation (STI) programmes in order to improve and stimulate a business-science cooperation culture in Lithuania. A particular focus was given to research and development (R&D) activities in four main sectors: engineering (including laser technologies), agro-food, life sciences, and information and communication technology (ICT). The role and development of pre-commercial procurement (PCP) and public procurement of innovation (PPI) was also considered. Best practices from Sweden, Ireland and the Netherlands were analysed to inform recommendations in this study.

This briefing is addressed to the Ministry of Economy and Innovation, the Ministry of Education, Science and Sport (MoESS) as well as other policy-makers in Lithuania.

Evolution of STI policy in Lithuania

A top priority of the Lithuanian Operational Programme for European Structural and Investment Funds (ESIF) for the period 2014-2020 was to improve research, development and innovation (RDI). The associated policy mix aimed to promote joint science-business R&D projects, facilitate demand for innovation through 'Pre-commercial procurement LT', and attract foreign direct investment (FDI) that supports innovation. While these have been beneficial, the national innovation system (NIS) is still affected by deep-rooted challenges which are difficult to resolve because they are often interlinked. To make further progress, three main issues emerge where intervention would be desirable:

1. A national vision and strategy: The Lithuanian STI system would benefit from a long-term national vision and strategy formulation. A joint vision, accompanied by clear responsibilities and key performance indicators (KPIs), would reduce the gap between science and business policies, and ensure consensus and commitment by all major stakeholders.
2. Flexible and more efficient policy implementation procedures: Making 'impact' rather than 'procedure' the priority, particularly when implementing ESIF measures, would increase the willingness and capacity of the private sector to engage in STI. This could be achieved through a shift away from the present top-down approach to formulating policy and implementation through the legislative framework. A more flexible approach would broaden and extend the possibilities and opportunities for new types of partnerships, ways of collaborating, policy incentives and bottom-up engagement of the STI community at large.
3. Need for a cultural environment that favours STI and entrepreneurship: Lithuania is still rather conservative and exhibits a risk-averse entrepreneurial tradition compared to other countries, which inhibits innovation-driven economic growth. This is partially a product of the small national market for innovation combined with the current research and education system. A stronger culture of academic entrepreneurship is needed. This will require changes to the present system of academic advancement and institutional funding mechanisms. Changes in the education system to boost relevant skills and competences would stimulate private-

sector innovation, particularly if it is combined with more demand-side instruments that create a culture of ‘innovation rather than imitation’.

Business-science cooperation barriers and drivers

Despite strong policy initiatives to encourage business-science cooperation over the last decade, challenges still remain. While some of these are common, others are more focused and therefore important to sector-specific policy. For example, while all four sectors are driven by interdisciplinary collaborations, the ICT sector is the only one driven by the recruitment of human resources while life sciences, engineering/lasers and agro-food all share the common driver of close proximity and well-established ties. In a similar manner, while regulatory barriers exist for all four sectors, ICT is the only area where capital-intensity has not been identified as a barrier. Agro-food is the only sector where lack of alignment between policy instruments and seasonal cycles is highlighted as a barrier, and limited absorption capacity for R&D knowledge in the private sector – rather than lack of interdisciplinary know-how – creates a barrier in terms of the skills base.

In Lithuania, it is clear that the four sectors have very specific characteristics, regulatory frameworks, contextual factors, collaboration cultures and motives, as well as their own potential for business-science collaboration. Therefore, sector-specific strategies and approaches to business-science collaboration are justified, although the set of available tools may be generic. Such an approach is present in other EU countries including Ireland, Sweden and the Netherlands, where a degree of sectoral focus is found within their existing support measures.

Mission-based STI policy – an emerging response for Lithuania

In recent years there has been a clear pivot in different countries away from sectoral policies towards a ‘mission-driven approach’ to STI (also referred to as ‘vision- or challenge-driven policy’). This is not restricted to bringing together science and businesses but also embraces other system players, such as the public sector or not-for-profit civil society organisations, and makes provision to involve them more directly in STI activities. This approach is now firmly endorsed by the European Commission.¹

Mission-driven policy uses both top-down and bottom-up approaches to develop and communicate a clear high-level vision of STI’s role in dealing with economic, societal and environmental challenges. They are increasingly interdisciplinary in approach, including an extremely varied set of stakeholders, long-term in nature and focus more on indicators of impact rather than short-term outputs. They reflect national priorities, including smart specialisation strategies (S3), but also EU and global initiatives, for example the UN’s sustainable development goals (SDG). While challenging to implement, they offer many advantages over traditional and more sector-focused STI programmes, and those countries experimenting with them have seen clear benefits. In particular, broadening participant involvement and encouraging cross-sector and interdisciplinary involvement offers increased opportunities for innovation to flourish. It also helps to overcome many of the barriers facing the research and higher education community as well as private sector, as captured above.

The introduction of a mission-based approach to research and innovation, as advocated in the EU’s forthcoming Horizon Europe funding programme and seen in other countries, offers a welcome change of direction. Applying ‘missions’ to the Lithuanian STI policy has the potential to stimulate not only business-science cooperation but also helps to address other gaps in STI implementation. These include a number of gaps identified as part of Lithuania’s preparation for the 2021-2027 EU Structural Funds programming and, specifically, the low ratio of business investments in RDI to gross domestic product (GDP), insufficiently innovative public-sector organisations, and unsuitable

¹ Mazzucato, M. (2018), ‘Mission-Oriented Research and Innovation in the EU: A problem-solving approach to fuel innovation-led growth’, European Commission and https://ec.europa.eu/info/horizon-europe/missions-horizon-europe_en

conditions for creating high-level knowledge (reduction of fragmentation)². A move towards mission-oriented STI policy will also be a step forward in addressing earlier recommendations for Lithuania, such as those put forward in a recent TAIEX report³. The topic of missions in STI policy is also central to the ongoing review⁴ of the Lithuanian R&I policy by the Organisation for Economic Cooperation and Development (OECD).

Conclusions and recommendations for policy action

A shift in STI policies towards a mission-driven approach would help Lithuania design modern and effective STI policies. This is a great opportunity for Lithuania to reinforce strategic orientation, tackle existing disciplinary, sectoral and policy silos, and encourage collective effort among different stakeholders as well as different policy-makers. This will also help to reinforce the culture of cooperation and co-creation – and not only between businesses and science but also bringing other stakeholders into the process. The recommendations below will set Lithuania on the road to a mission-driven approach to STI.

Recommendation 1: Apply mission-orientation to the National Science and Technology Programmes (NSTPs)

Recommendation 2: Apply different scenarios for mission-oriented STI policy to the sectoral context in Lithuania

Five scenarios are proposed that allow the introduction of a mission-oriented approach to STI policy and the NSTPs. These scenarios are not necessarily mutually exclusive, can be combined, and can have differing degrees of ‘fit’ to the sectoral context and level of disruption to the status quo:

- Scenario 1: ‘Traditional’ science and technology programme (STP) with missions
- Scenario 2: A strategic umbrella NSTP based on the current set of instruments
- Scenario 3: A new strategic umbrella NSTP
- Scenario 4: Bringing existing instruments closer to missions
- Scenario 5: Challenge-based Innovation Fund

Scenario 1 envisages the introduction of a mission/vision to a traditional STP style of programme. It largely builds on existing practice so no major changes to governance and implementation would be required. It could be built on the existing ‘purposeful research’ (*reikminiai tyrimai*) programme implemented by the Lithuanian Research Council⁵. While the easiest to adopt, it is the least suitable to address the specifics and challenges of the Lithuanian ICT sector.

Scenario 2 envisages a strategic umbrella NSTP based on the current set of instruments. It would require the inclusion of new additional assessment criteria but pave the way for a smooth transition towards a mission- or challenge-based approach to STI policy and NSTPs. It is also not fully suited to addressing the specifics and challenges of the Lithuanian engineering sector.

² Ministry of Economy and Innovation and Ministry of Education, Science and Sport (2020), ‘Investing in R&D and the development of an innovative and smart economy: a “map” of achievements, lessons learnt and the remaining development needs’, [https://esinvesticijos.lt/uploads/main/documents/files/Post%202020/Programos%20rengimas/MTEP%20žemėlapis%20santrauka_EN%20\(final\).pdf](https://esinvesticijos.lt/uploads/main/documents/files/Post%202020/Programos%20rengimas/MTEP%20žemėlapis%20santrauka_EN%20(final).pdf)

³ European Commission, SRSS (2019), ‘TAIEX SRSP series to support the Lithuanian science, technology and innovation (STI) policy: Specific view on governance, evaluation and collaboration issues - final report with policy recommendations’

⁴ <https://strata.gov.lt/en/news/29-news/770-oecd-will-analyse-and-help-to-improve-lithuania-s-innovation-system>

⁵ <https://www.lmt.lt/lt/mokslo-finansavimas/valstybes-uzsakomieji-tyrimai/reikminiu-tyrimu-projektai/304>

Scenario 3 envisages a completely new strategic umbrella NSPT created around missions or challenges. The main difference with Scenario 2 lies in the introduction of seed funding to support a fully bottom-up approach to the creation of missions and challenges. It would create a large-scale programme subject to constant monitoring. This scenario would require the most dramatic change in the current STI policy but would benefit all four sectors.

Scenario 4 envisages bringing existing instruments closer to missions while Scenario 5 proposes the creation of a challenge-based Innovation Fund. These two scenarios are not directly linked to establishing an NSTP but are options for the introduction of a mission- or challenge-based approach to STI policy. Of the five scenarios presented here, Scenario 4 is likely to be the easiest to introduce and test but may not be a good fit for the engineering sector. Whereas the challenge-based Innovation Fund may not fit well with agro-food but is extremely favoured by the ICT sector.

Recommendation 3: Define missions through a combined top-down and bottom-up approach

To drive this process in Lithuania, different ministries including various thematic ministries, and together with other policy-makers such as the Research Council and the Agency for Science, Innovation and Technology (MITA), should jointly agree on mission statements. These could be framed around the S3 priorities for the country (see Recommendation 5 below). It is critical to make this process as flexible as possible. The expectation should be that various national stakeholders (i.e. companies, research and education institutions, clusters, user groups, association, science and technology parks, etc.) take up and co-develop these missions suggested by the policy-makers. This is needed to move away from a purely top-down approach, attract new types of actors and build new connections for delivering on missions which truly capture the needs and views of the whole community. Such a co-creation approach would also fit nicely into the recent strategies approved by the Lithuanian Government, such as 'Lithuania Co-create'⁶ and the National Development Plan that emphasise innovation as a horizontal priority.

A possible opportunity for early intervention also lies with the so-called Plan for the DNA of the Future Economy⁷. The existing Plan does not have a set mission or a challenge to be addressed. If this Plan is to continue beyond 2021 it is strongly recommended to structure it around one or several missions or challenges, under which all the currently funded activities and priorities can be accommodated.

Recommendation 4: Link missions with the smart specialisation strategy and priorities

At European level, a range of recent policy papers and reports have explored how to align future (2021-2027) smart specialisation strategies in terms of their contribution to meeting sustainable development goals, contributing to European-level missions (as defined for Horizon Europe), or to broader policy agendas such as the European Green Deal. This has led to a call for a shift in policy logic from S3 to smart specialisation strategies for sustainable and inclusive growth (S4).

Mission-driven approaches that seek to address selected societal challenges can be the basis for identifying novel combinations of specialisations within an economy that are of a cross-sector and multidisciplinary nature, and for expanding the triple helix towards a quadruple helix approach.

Recommendation 5: Expand a list of beneficiaries in the NSTPs and other support measures

The new NSTPs and other support measures created around missions should take a broader approach to involving actors from the STI ecosystem when defining the list of eligible beneficiaries under funded programmes. Programmes that exclude the private sector or other stakeholders lack diversity and the critical momentum needed to innovate for economic or societal good.

⁶ See (in Lithuanian) <https://lietuva.lt/lietuvos-pristatymo-uzsienyje-2020-2030-m-strategija/>

⁷ <https://finmin.lrv.lt/en/news/the-government-approves-the-plan-for-the-dna-of-the-future-economy>

Recommendation 6: Encourage cross-sectoral and cross-disciplinary consortia

Involving cross-sectoral, cross-actor, and cross-disciplinary teams in achieving a set mission offers several benefits, but introducing a new approach like this to the national STI system may also encounter difficulties in (a) getting a particular stakeholder group to join a project team, and (b) motivating the lead organisation to include teams from a variety of stakeholder types. To tackle these issues, incentives should be offered to encourage greater cross-sectoral, cross-actor, and cross-disciplinary involvement, and the matter should be reflected already in the call for proposal's evaluation criteria.

Recommendation 7: Make monitoring and evaluation an integral part during the design and implementation of programmes

The long-term agendas set by mission-type policy interventions require well-structured monitoring and evaluation procedures that should be part of the initial NSTP roadmap design process. Each mission should be structured with respect to both a narrative vision (a statement of intent or objectives) and short-, medium- and long-term effects (targets, quantified to the extent possible) to be achieved by the interventions. Strategic reviews linked to additional rounds of funding should be performed periodically to provide a basis for a 'go-no go' decision by the programme management.

Recommendation 8: Reduce fragmentation and lack of strategic orientation on the national level

Different sectoral ministries are recommended to combine their funds through allocating up to 20% of their procurement budget to co-funding the NSTPs. The basis for this has already been established by the newly approved National Development Plan⁸ and by the National Council for Science, Technology and Innovation. They demand that, by 2030, all public institutions' procurement budgets should go to innovative, pre-commercial procurement or 'purposeful/on-demand' R&D⁹. Furthermore, it is recommended to implement composite measures that integrate different R&D activities (across all development phases) and ensure phased implementation; success in one stage results in simplified procedures in the consecutive stage(s). Successful implementation of one phase would result in a simplified application for the next phase. It implies a re-evaluation of the original idea to test if it is still worthy of implementation.

Supporting recommendations...

There are also three recommendations proposed by expert groups in earlier studies which are valid and important in the context of this policy briefing. The first is to incentivise ministries and agencies to cooperate, and develop a common language and strategy to implement a mission-based approach¹⁰. The second is to reassess the services provided by business agencies and create a single innovation agency to gain greater synergy¹¹. The third additional recommendation is to address the need for professional boundary-spanning capacity, create a single national interface structure, and strengthen operations within technology transfer offices, digital innovation hubs, cluster organisations and other collaboration platforms¹².

⁸ <https://epilietis.lrv.lt/lt/konsultacijos/del-2021-2030-metu-nacionalinio-pazangos-plano>;
[https://epilietis.lrv.lt/uploads/epilietis/documents/files/2%20HORIZINTALIEJI\(1\).pdf](https://epilietis.lrv.lt/uploads/epilietis/documents/files/2%20HORIZINTALIEJI(1).pdf)

⁹ <https://strata.gov.lt/lt/naujienos/8-naujienos/570-susitarta-del-reiksming-inovacij-reformos-zingsni>

¹⁰ European Commission, SRSS (2019), 'TAIEX SRSP series to support the Lithuanian science, technology and innovation (STI) policy: Specific view on governance, evaluation and collaboration issues - final report with policy recommendations'

¹¹ <https://www.visionary.lt/reports-2/science-technology-innovation/evaluation-of-measures-fostering-business-rd-under-the-2014-2020-operational-programme> and https://rio.jrc.ec.europa.eu/sites/default/files/report/SS%20Lithuania_Final%20Report.pdf

¹² https://rio.jrc.ec.europa.eu/sites/default/files/report/SS%20Lithuania_Final%20Report.pdf

Recommendations on PCP and PPI

In addition, the following recommendations are made regarding using public procurement to support innovation.

Recommendation 9: Continue the support for PCP and PPI

Promoting innovation through procurement practices has a two-fold effect: the public sector can use its procurement behaviour to stimulate businesses to develop new products and/or services. These innovations can, in turn, help the public sector to increase the quality of its offering and reduce its costs. Lithuania must continue to develop the practice of pre-commercial procurement (PCP) and public procurement of innovation (PPI) as stipulated by the Law on Technology and Innovation (2018). It may be possible to bring PCP/PPI into the delivery of national missions but this would require flexibility in how the mission programmes are set, for example by offering applicants a degree of freedom on how to apply, including using a PCP route.

Recommendation 10: Develop PCP/PPI capacities within the public sector

Over the past few years, Lithuania has implemented a range of capacity-building initiatives to boost awareness and competence among public procurers. It is paramount to further encourage public-sector buyers to seek innovative solutions to solve identified problems. Capacity-building support instruments should thus cover the establishment of a network of 'innovative public procurers', facilitation of networking and experience-sharing among contracting authorities, joint problem-setting, targeted practice-oriented training, methodological support, and collection and dissemination of knowledge in the form of guidelines and good practices.

Recommendation 11: Introduce buyer-supplier dialogue

For a PCP/PPI process to work, there should be a clear interest and incentive for the public sector to get involved. It is recommended that MITA start working with public-sector organisations to help them identify the needs within their institutions.¹³ A dedicated support instrument could be created to facilitate the preparatory phase, such as market analysis and dialogue with suppliers, bringing together contracting authorities and potential suppliers to help them understand the market.

Recommendation 12: Increase uptake through positive examples

Understanding of and interest in the opportunities offered by PCP/PPI need to be cultivated over time. Promoting examples of successfully-completed PCP/PPI projects, especially when a private company commercialised the delivered solution, will help stimulate interest both from the buyer and supplier side. When 'growing by example' is taken as an approach (at least at the initial uptake stage) it will also help to address questions of quality assurance.

¹³ A similar observation about the importance of identifying the needs was made in a recent report: Lithuanian Innovation Centre (2020) *Inovatyvių viešųjų pirkimų įgyvendinimo gairės*, as part of the Interreg 'iBuy' project, <https://lic.lt/wp-content/uploads/2020/09/Inovatyviu-viesuju-pirkimu-gairės.pdf>

Glossary of abbreviations

ICT	Information and Communication Technology
DG	Directorate General
ESIF	European Structural and Investment Funds
GDP	Gross Domestic Product
KPIs	Key Performance Indicators
MITA	Agency for Science, Innovation and Technology
MoEI	Ministry of Economy and Innovation
MoESS	Ministry of Education, Science and Sport
NIS	National Innovation System
NSTPs	National Science and Technology Programmes
OECD	Organisation for Economic Cooperation and Development
PCP	Pre-Commercial Procurement
PPI	Public Procurement of Innovation
R&D	Research & Development
RDI	Research, Development and Innovation
S3/S4	Smart Specialisation Strategy (for Sustainable and Inclusive Growth)
SDG	Sustainable Development Goals
STI	Science, Technology and Innovation
STP	Science Technology Programme

This policy brief has been produced as an output of the service contract: 'Enhancing the efficiency of the cooperation between business and science' SRSS/C2019/065 funded by the European Commission – Structural Reform Support Service and delivered for the benefit of the Lithuanian Ministry of Economy and Innovation (MoEI), the Ministry of Education, Science and Sport (MoESS) and other policy makers in Lithuania.