



# Specific Support for Lithuania

## Fit for the future

Incentivising research and innovation partnerships  
and attracting innovative investment to Lithuania

Horizon 2020 Policy Support Facility



## **Specific support for Lithuania – Fit for the future**

European Commission  
Directorate-General for Research and Innovation  
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***Specific Support for Lithuania***

**Fit for the future**

Written by the independent panel of experts

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## **LIST OF ABBREVIATIONS**

<i>BERD</i>	<i>Business expenditure on R&amp;D</i>
<i>CEE</i>	<i>Central and Eastern Europe</i>
<i>CIS</i>	<i>Community Innovation Survey</i>
<i>CVPA</i>	<i>Central Project Management Agency</i>
<i>DG</i>	<i>Directorate-General</i>
<i>ECEI</i>	<i>European Cluster Excellence Initiative</i>
<i>EFQM</i>	<i>European Foundation for Quality Management</i>
<i>EIF</i>	<i>European Investment Fund</i>
<i>EIS</i>	<i>European Innovation Scoreboard</i>
<i>ESIF</i>	<i>European Structural and Investment Funds</i>
<i>EU</i>	<i>European Union</i>
<i>EU28</i>	<i>28 Member States of the EU</i>
<i>FDI</i>	<i>Foreign Direct Investment</i>
<i>GBER</i>	<i>General Block Exemption Regulation</i>
<i>GDP</i>	<i>Gross domestic product</i>
<i>GVA</i>	<i>Gross value added</i>
<i>HERD</i>	<i>Higher education expenditure on R&amp;D</i>
<i>HEI</i>	<i>Higher education institute</i>
<i>ICT</i>	<i>Information communication technology</i>
<i>InvestLT</i>	<i>Invest Lithuania</i>
<i>IPA</i>	<i>Investment Promotion Agency</i>
<i>IPF</i>	<i>InnoPartnering Forum</i>
<i>IPR</i>	<i>Intellectual property rights</i>
<i>KPI</i>	<i>Key performance indicator</i>



<i>M&amp;A</i>	<i>Merger and acquisition</i>
<i>MITA</i>	<i>Agency for Science, Innovation and Technology</i>
<i>OAC</i>	<i>Open Access Centre</i>
<i>OECD</i>	<i>Organisation for Economic Cooperation and Development</i>
<i>PRO</i>	<i>Public research organisation</i>
<i>PSF</i>	<i>Policy Support Facility</i>
<i>R&amp;D</i>	<i>Research and development</i>
<i>RDI</i>	<i>Research, development and innovation</i>
<i>R&amp;I</i>	<i>Research and innovation</i>
<i>RI</i>	<i>Research infrastructure</i>
<i>RIS3</i>	<i>Research and Innovation Strategy for Smart Specialisation</i>
<i>SME</i>	<i>Small and medium-sized enterprise</i>
<i>STP</i>	<i>Science and technology park</i>
<i>TRL</i>	<i>Technology readiness levels</i>
<i>TTO</i>	<i>Technology Transfer Office</i>
<i>UNCTAD</i>	<i>United Nations Conference on Trade and Development</i>
<i>VC</i>	<i>Venture capital</i>
<i>WEF</i>	<i>World Economic Forum</i>

## **THE PSF SPECIFIC SUPPORT PANEL**

**Hans-Jörg Bullinger, chair (Germany):** was the founding director of the Fraunhofer IAO; he is also Professor of Industrial Science and Technology Management at the University of Stuttgart. From 2002 to 2012, he was the President of the Fraunhofer-Gesellschaft. He is also a member of the Scientific Board of AutoUni Wolfsburg. He began his career as a manufacturer for the Daimler-Benz company in Stuttgart, after which he obtained a degree at the University of Stuttgart, graduating with a Master's degree and PhD in manufacturing. While in charge of the Stuttgart-based Fraunhofer Institute for Production Technology and Automation, Prof. Bullinger was responsible for many applied research projects in the field of design and manufacturing, with the aim of increasing the productivity of computer-based systems. These projects were carried out together with well-known German companies, such as Robert Bosch, Siemens, VW, Daimler Benz and others. Prof. Bullinger was also Chairman of the Industry-Science Research Alliance, the Advisory Board of the German Federal Government for implementation of its high-tech strategy. He has published more than 1000 articles and books on industrial engineering, technology and innovation management.

**Alasdair Reid, rapporteur (Belgium):** has 20 plus years of experience in public policy research in the fields of regional economic development and innovation systems. He is founder and managing director of the European Future Innovation Systems Centre, a non-profit scientific research organisation working on contract research and studies on European innovation policy, performance and systems. Previously, he founded and led the Technopolis Group Brussels and Baltic offices for 12 years. Throughout his career, he has provided advice and support to the European Commission, international organisations (OECD, World Bank) and national and regional governments and agencies throughout the EU and in third countries. He has published extensively in peer-reviewed journals and books, notably focusing on the design and evaluation of regional development and innovation policies and the links with economic trends.

**Michel Lemagnen, expert (United Kingdom):** has been working in the field of foreign direct investment (FDI) for 20 years, since 2010 as co-founder and managing director of MCJ Lemagnen Associates Ltd. Prior to that, Michel was a co-founder and research director at Oxford Intelligence. He has been engaged in corporate location work around the world and, since 2007, has gained particular experience supporting the Helsinki Business Hub (the regional development agency for the Helsinki region). Michel was involved in two international mentoring programmes with Enterprise Estonia in the capacity of FDI mentor, a key element of which has been helping the Invest Estonia team to attract higher-value FDI projects. He regularly supports city, regional and

national investment promotion agencies in their strategy and implementation towards FDI attraction, expansion and retention.

**Emily Wise, expert (Sweden):** is a research fellow at the University of Lund and independent consultant – providing research, analysis, advisory support and process facilitation services in the field of innovation policy. Emily has a particular focus on international innovation collaboration, cluster development strategies and other collaborative innovation approaches – and a geographical focus on the Baltic Sea Region (BSR). Over the past 13 years, she has worked with public-sector clients to support the development and implementation of innovation activities within the EU Strategy for the BSR. Emily has a BSFS in international politics from Georgetown University (1991), an MBA from the Darden School of Business at the University of Virginia (1997), and a PhD in research policy from Lund University (2014).

The expert team was supported by **Agné Paliokaitė** (Visionary Analytics) who prepared the background report based on a structure proposed by the rapporteur then revised it according to comments from the expert team. The experts were also supported by the PSF Team comprising the PSF contractor (represented by **Jelena Angelis**, project manager at Technopolis Group) and the Commission services (DG Research and Innovation, Unit A4 – ‘Analysis and monitoring of national research policies’) with **Eugenija Pučiūtė** as the contact point from DG Research and Innovation, who coordinated the exercise and ensured liaison with the Lithuanian authorities. **Kimmo Halme**, 4Front, acted as the quality reviewer.

The Lithuanian authorities provided available data and background documentation useful for the panel’s work, and also supported the visits to Lithuania (i.e. inviting the representatives of government institutions and stakeholders; providing meeting facilities and interpretation, as required). Coordination for the Lithuanian authorities was assured by the Office of the Government of the Republic of Lithuania which ensured the involvement of other relevant ministries, agencies or bodies and made available facilities for the meetings and workshops.

## **POLICY MESSAGES**

The Lithuanian innovation system has undergone considerable restructuring and witnessed significant investment over the last decade. This has led to improvements in capacity and performance in the higher education and research system, although from an international perspective, overall output and quality remain low. On the business side, the economy remains largely dominated by lower value-added production and is weakly integrated in global value chains, despite a slight shift towards high-tech manufacturing and knowledge-intensive services. Recognising these challenges, the Lithuanian government expressed interest in receiving support under the Horizon 2020 Policy Support Facility (PSF) on two specific topics:

- cooperation between the public science base and business; and
- attraction of innovation-oriented foreign direct investment (FDI).

As regards the first topic, the expert team concluded that there are four overall challenges:

- Intensive science-business cooperation in Lithuania is limited to a small number of niche, high-tech sectors (e.g. biopharmaceuticals, photonic and some information and communication technologies (ICT)). Wider-scale science-business cooperation is hindered by a number of clearly identified and well-recognised barriers on both sides of the equation (spelt out in the background report). A first challenge is that the policy mix does not sufficiently address the key bottlenecks on either the supply (science) or demand (business) side. In particular, there are specific gaps and inconsistencies in the policy measures designed to support science-business cooperation.
- On the science side, the significant investment, co-financed by the European Structural and Investment (ESI) Funds, since 2007, in research infrastructure (buildings and equipment) has not been matched by sufficient growth in the number and skills sets of the management, researchers and technicians in the open access research centres (OACs). In particular, the OACs' applied research activities remain over-dependent on core funding from government, despite limited growth in contract research (including testing and related services) income. Most of the OACs have been unable to create more permanent and structured business partnerships which raises issues of future financial sustainability. Therefore, a second key challenge is to support and incentivise a more business-orientated strategy for the country's network of applied research facilities.
- On the business side, there is a need to build capacity (by which we mean skilled staff with skills and experience in designing and managing innovation

processes) within a larger number of companies, across a broader range of sectors. In saying this, we recognise that the Lithuanian smart specialisation strategy seeks to concentrate investment in six priority areas (divided into 20 more specific priorities). However, evidence from the first round of joint science business calls underlines the highly variable capacities among businesses across the priority areas to design and develop research and innovation (R&I) partnerships. Thus, a third challenge is to better identify and proactively support businesses with the ambition or competitive need to innovate to develop the internal capacity they require to engage with and absorb knowledge.

- The fourth challenge concerns the highly fragmented nature of the 'bridging' and R&I advisory organisations in Lithuania. Past policy initiatives and decisions have created an 'ecosystem' of business support and funding agencies, science, education and business valleys, OACs, science and technology parks and over 50 clusters. The system is neither effective nor efficient and leads to a dispersion of public funding rather than the consolidation of investment and targeted support for sustainable and strategic innovation partnerships.

As regards the second topic, the expert team highlights four key issues:

- First, Invest Lithuania (InvestLT) has had some success in attracting FDI in business services (shared services, contact centres), software development/IT services and, to a lesser extent, in manufacturing. However, in terms of attracting R&D and, more broadly, innovation-oriented FDI, it is still early days. There have been some high-profile wins in software design, development and testing but, in terms of pure R&D centres, Lithuania faces a tougher challenge. Almost all the foreign affiliates with core R&D facilities are in fields such as life sciences and lasers and are the result of mergers and acquisitions (M&A). However, there are a few other examples of innovative activities with the critical mass to attract higher value-added investment from foreign sources. In this context, the current target set for attracting FDI projects with some form of R&I function is highly ambitious.
- Secondly, InvestLT is mainly mandated to attract greenfield FDI. In the context of innovation-oriented FDI, there are other modes of investment, and precursors to investment (R&D contracts, innovation pilots, venture capital investments in start-ups) which need to be considered and serviced to increase Lithuania's attractiveness as an 'innovation-location' and to secure long-term, higher-value investment. There is a clear link here with the challenge identified above to reduce the fragmented R&I policy system and develop more structured innovation partnerships.

- Thirdly, InvestLT's strategy places greater emphasis on attracting new investors rather than 'aftercare' (or investor development), that is the retention and growth of existing foreign companies. Evidence from successful countries shows the critical importance of aftercare in securing longer-term, sustainable investment that enables locations to move up the value chain. We firmly believe this is much needed to ensure Lithuania's success in attracting FDI, in particular for innovation-oriented FDI. This has significant implications for resourcing FDI attraction activities, both in Lithuania and overseas.
- Fourthly, skills bottlenecks in a number of priority FDI sectors pose a significant challenge. In this respect, talent attraction and retention are closely related. Indeed, talent circulation and the mobilisation of Lithuanian diaspora to help position Lithuanian research and business internationally will be key to improving both the international openness of Lithuania's innovation system and 'knowledge transfer and absorption' nationally.

The expert team underlines that attracting innovative FDI cannot be disconnected from the overall performance of the innovation system (e.g. availability of skilled staff or industrial testing and R&D capacity). Moreover, if the national suppliers and partners of the foreign investment firms do not have sufficient capabilities to engage with the more advanced foreign know-how, the impact on technological diffusion and upgrading will be compromised. Hence, there is a need to ensure that efforts to secure new 'innovation-rich' investment or encourage follow-on investments from existing foreign investor firms are twinned with measures to help Lithuanian suppliers and partners of these firms to improve their position in global value chains.

Based on a background report and two missions to Lithuania, the expert team has identified three key policy messages that underpin the more detailed recommendations, as follows:

1. **Consolidate and professionalise business innovation support:** the Lithuanian innovation policy system remains over-fragmented at various levels from the multiple agencies tasked with supporting enterprises to the plethora of sub-critical-scale cluster organisations. This undermines the potential to deliver high-quality services and to retain and build staff capacities. The dispersion of resources and multiplication of organisations is also expensive and ineffective from a budgetary point of view. We outline in our recommendations how this process of consolidation can be achieved over the period to 2020 to ensure that Lithuania has a fit-for-purpose business innovation support system in place at the start of the next programming period. Related to this consolidation process is a need to overhaul the policy instruments

intended to encourage business investment in innovation and stimulate knowledge exchange, mobility and cooperation within the system.

2. **Segment and accompany companies with potential to scale and add value:** a key barrier to increasing innovation activity and outputs in the business sector is the limited absorptive capacity. We advocate a wholesale change in the way business support agencies and related organisations (such as clusters, technology transfer services, etc.) work with the business sector. This will involve a process of segmenting businesses, not by sector, but by their 'ambition to change'. R&I policy should be focused on those companies, whether domestically or foreign owned, that have potential to innovate or grow (in both manufacturing and traded services). Similarly, we make recommendations for broadening the scope of what is considered to be 'innovation-oriented' foreign investment. These recommendations address the need for tailored advice at different stages in business development by adopting a 'company-centric' approach through account management of firms and reinforcing aftercare for foreign investors.
3. **Incentivise new forms of R&I partnerships:** there is scope for a paradigm shift away from the current policy that essentially promotes 'individual innovation events' (by providing grant funding to specific businesses), to one where R&I policy 'sets the framework conditions' in which innovation systems 'self-organise' and, thereby, enhance innovation opportunities and capabilities. A number of recommendations are aimed at strengthening and stimulating the foundation of new forms of partnerships in the Lithuanian R&I system: a new funding model for applied research centres based on partnerships with business, innovation platforms that pilot innovative products or services (in partnership with foreign investors), reinforcing the role of clusters in developing innovation ecosystems, etc.

The expert panel proposes 13 specific recommendations grouped into three themes: strengthened foundations for the R&I policy support system, science-business cooperation, and innovation-oriented FDI. For each recommendation, we summarise the rationale underpinning it, followed by the detailed recommendation, and we set out the operational steps required and time frame for implementation. The tables below summarise these recommendations.

Figure 1: Summary of recommendations

<b>Strengthened foundations for the R&amp;I policy support system</b>	<b>Timescale</b>
Consolidate then rationalise the business support agencies' structure, including investment, export and innovation functions	Phased in from 2018
Overhaul the financial incentives for business innovation cooperation and investment (domestic and foreign owned) including the R&D tax credit	By 2018
Refocus investment and business cooperation advice towards a target group of growth companies independent of their economic sector	By 2019

<b>Business-science cooperation</b>	<b>Timescale</b>
Introduce innovation voucher follow-on awards to foster successful business-science partnerships	In 2018
A performance-and-partnership-based funding model for applied research centres	From 2019
Develop stronger, more internationally visible and professional cluster initiatives	By 2018
Create a single national interface structure (staffed by industrially experienced staff) to ensure proactive engagement with business	By 2019

<b>Innovative foreign direct investment</b>	<b>Timescale</b>
Revise classification of innovation-oriented FDI and related key performance indicators	2018
Review the sector and country targeting to improve coverage of most likely sources of innovative FDI	2018
Shift towards an FDI aftercare strategy based on key account management	2018-2019
Reinforce the staffing available to attract FDI, notably in the overseas network	2018-2020
Encourage alternative modes of innovation-oriented FDI projects and activities that are precursors to FDI	2018-2020
Develop a talent-attraction initiative to reinforce Lithuania's image as a place where innovators live and work	2019-2021



## **THE PSF SPECIFIC SUPPORT TO LITHUANIA**

The Horizon 2020 Policy Support Facility (PSF) is an instrument aimed at supporting Member States and countries associated to Horizon 2020 in improving the design, implementation and evaluation of their national R&I policies and systems. The PSF was set up by the European Commission, DG Research and Innovation (DG RTD), under Horizon 2020.

Specific support services provide tailored advice, expertise and good practice to help Member States and Associated Countries in the design or implementation of a specific reform or topic concerning R&I strategies, programmes or institutions. This is carried out by an international and independent expert panel which formulates concrete and operational recommendations for the national authorities on the reforms necessary to address the specific objectives.

The Lithuanian government expressed its interest in the context of the second call for expressions of interest for PSF services. DG RTD provided a positive reply in its letter of 30 May 2016. Further contacts between the Lithuanian authorities and DG RTD led to an agreement on a PSF 'Specific Support' activity focusing on two specific topics:

- cooperation between the public science base and business; and
- attraction of innovation-oriented foreign direct investment (FDI).

The PSF expert panel worked from February 2017 to September 2017. The panel included four independent experts from Germany, Belgium, the UK and Sweden, acting in a personal capacity.

### **AIM AND FOCUS OF THE REPORT**

This report summarises the outcome from the specific support including an assessment of the current situation, identification of the policy levers that could be used, and concrete recommendations (policy and implementation scheme level) to tackle the key barriers in relation to science-business cooperation and attraction of innovation-oriented FDI. The report is structured as follows:

- In section 1, we present our concise overview of the challenges facing the Lithuanian R&I system as a context for the specific recommendations that are developed in the subsequent sections. We emphasise that specific adjustments to policy related to business-science co-operation or attracting FDI cannot be expected to achieve their aims unless they are embedded in a realistic understanding of the strengths and weaknesses of the overall innovation system as well as external constraints and trends.

- In section 2, we propose three cross-cutting recommendations to create a 'fit-for-purpose' business support system. This implies the significant rationalisation of business support agencies, a more targeted policy aimed at companies with growth potential, and a review of incentives for innovation investment and cooperation. We consider that these proposed changes are necessary for the successful implementation of the specific recommendations we then develop in the following two sections.
- The expert team sets out four operational recommendations, in section 3, to improve the effectiveness of policy interventions for business cooperation with the public and higher education science base. These recommendations range from a specific proposal to provide follow-on funding to successful projects funded under the innovation vouchers measure to a complete overhaul of the current fragmented and ineffective cluster policy. The two other recommendations aim to increase the incentive for scientists to engage with business and the creation of a national interface structure with a mission to proactively help businesses to develop innovation projects.
- In the final section on innovation-oriented FDI, we examine the current policy framework and strategic priorities, notably the operational goals and activities of Invest Lithuania. We set out six recommendations to further enhance the effective delivery of policy not only towards new foreign investors and talent, but importantly by improving aftercare services for existing investors with a view to encouraging them to invest in higher-value-added and more innovative activities in Lithuania.

## **METHODOLOGY**

To arrive at our recommendations, the PSF expert team:

- conducted research, meta-analyses and interviews with Lithuanian experts, national authorities and other stakeholders;
- drafted this report presenting the results of our analysis of the present situation and formulated a limited number of operational recommendations.

The project was delivered in three phases: a preparatory phase; a first country visit and reporting phase; and a second country visit to discuss and adjust our recommendations and policy options. The support process was structured as follows:

- Drafting the background report and kick-off meeting (Brussels) on 22 February with the Lithuanian authorities.
- A first mission of the expert team to Lithuania from 10-12 April.

- A working meeting of the expert team in Brussels on 23 May to discuss a first version of the draft report.
- Submission of the draft report to the Lithuanian authorities.
- A second mission from 28-30 August to enable a discussion on the draft recommendations.
- Final report on 15 September.
- Dissemination of report during the high-level conference 'Innovation Drift', 12-13 October.

The 2016 OECD Review of Lithuanian Innovation Policy analysed the Lithuanian R&I system and provided a set of high-level recommendations. Building on this work and the annual Research and Innovation Observatory country reports, an analytical background report was prepared (Palokaitė, 2017). This provides a detailed assessment of the most relevant data and elements concerning the two focus areas. The background report includes a presentation of the main facts and figures relating to the two focus areas and to the existing public policies, legislation, strategies and policy measures related to these topics.

Based on the background report and discussions with the Lithuanian authorities at the kick-off, an interview guide was developed. The expert team took account of the political and policy developments in Lithuania since the request for support was submitted. The Lithuanian authorities proposed an interview schedule which was refined following feedback from the expert team.

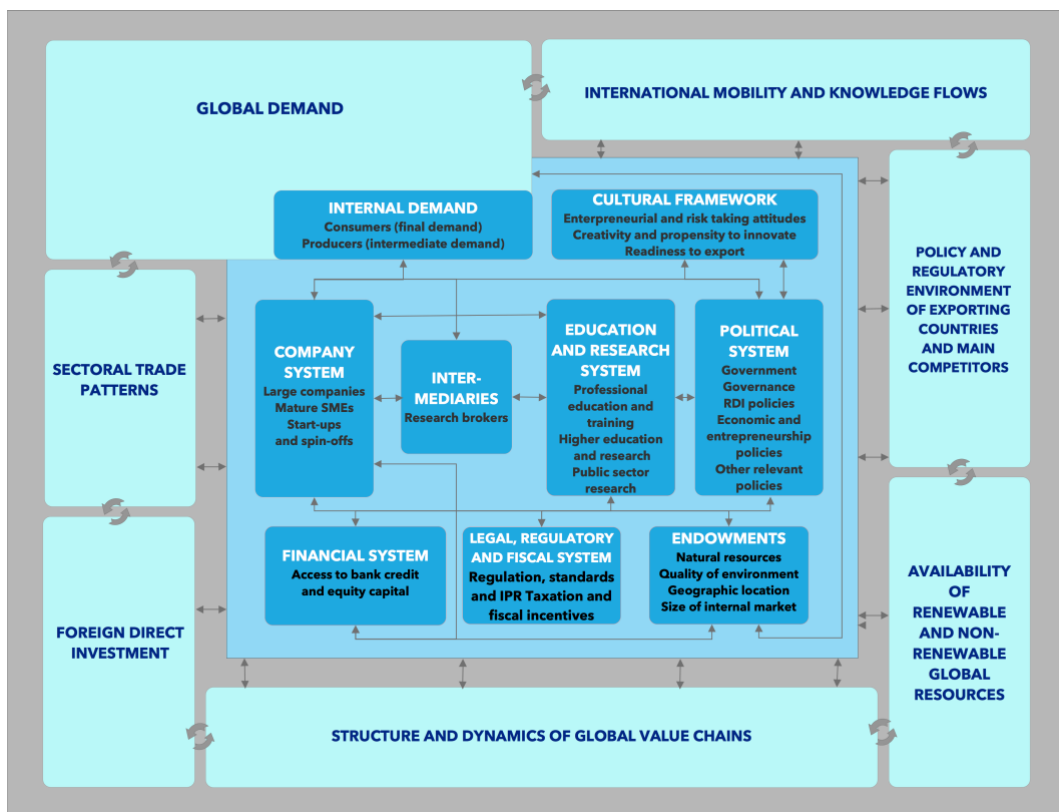
The first mission involved a series of working meetings with political, policy, university and business stakeholders during which Lithuania's situation was discussed and specific questions were reviewed. A number of follow-up interviews were conducted by telephone, notably concerning the topic of innovative FDI.

This report is based on these building blocks and starts with an assessment of the present situation (drawing on the background report and additional materials and opinions collected during the mission). In a first step, the expert team evaluated the main barriers and opportunities in relation to science-business cooperation and FDI in R&I. The team then identified possible policy levers that could be used to improve the situation. In a second step, specific and concrete recommendations were developed in relation to these policy levers and were discussed during the second mission with the Lithuanian authorities and stakeholders.

# 1 AN OPEN AND EFFECTIVE INNOVATION SYSTEM: THE CHALLENGES FACING LITHUANIA

This specific support action addresses two key issues within the broader Open Science, Open Innovation, Open to the World (the 3 O's proposed by Commissioner Moedas) agenda launched in June 2015<sup>1</sup>. While our report addresses the specific issues of business-research cooperation and innovation-oriented FDI, we recognise that policy 'recipes' for tackling problems or seizing opportunities in these fields will not be successful if they do not take into account the broader context of the Lithuanian innovation system. Lithuania's policy, research and business sectors operate in an interconnected world and due account must be taken of the external factors that can influence or hinder the desired developments at national level.

Figure 2: Open innovation system



Source: Reid et al., (2016), [https://www.tekes.fi/globalassets/julkaisut/330\\_2016\\_global-competitiveness.pdf](https://www.tekes.fi/globalassets/julkaisut/330_2016_global-competitiveness.pdf)

<sup>1</sup> See: <http://ec.europa.eu/research/openvision/index.cfm>

Our consultations with Lithuanian stakeholders largely confirmed the main conclusions of the background report (Palokaitė, 2017). To summarise the evidence that underpins our recommendations, we have adopted an open innovation system perspective to summarise both internal (national) and external (European or international) factors. This framework (Figure 2) identifies issues to be addressed or that may influence the likelihood of attaining the desired policy outcomes. In Figure 3, we present the current position and trends (since 2010) for a core set of indicators relevant for the two focus areas covered by this report. In the next two tables (Figure 4 and 5), we summarise the evidence for the internal and external competitiveness factors based on the background report before commenting on the most important challenges we identified overall.

Figure 3: Key metrics for business science cooperation & innovation-intensive FDI

Indicator	LT 2010 %	Lithuania current %	EU-28 or benchmarks* %
Summary innovation index (EIS2017) relative to EU-28	58.3 ↗	↗ 79.4	100
Higher education R&D (HERD) financed by business enterprise sector as percentage of GDP (Eurostat) (2014)	0.06 ↗	↗ 0.07	0.03
Business expenditure on R&D (BERD) as percentage of GDP (Eurostat) (2014)	0.23 ↗	↗ 0.32	1.3
Total intramural R&D (GERD) by business enterprise sector financed from abroad, % of GDP (Eurostat) (2014)	0.05	↗ 0.07	0.14
Total intramural R&D (GERD) by higher education sector financed from abroad, % of GDP (Eurostat) (2014)	0.08	↗ 0.22	0.04
Enterprises cooperating with universities or other HEIs (2014) (Eurostat, Community Innovation Survey)	n.a.	8	Estonia 14.6 Finland 23
Enterprises cooperating with government, public or private research institutes (2014) (Eurostat, CIS)	n.a.	4.8	Estonia 9.5 Finland 18
Enterprises engaged in any type of innovation cooperation with EU/EFTA/EU candidate countries (excl. national) (2014) (Eurostat, CIS)	n.a.	19.8	Estonia 38.9 Finland 24.7

Indicator	LT 2010 %	Lithuania current %	EU-28 or benchmarks* %
Lithuanian Global Value chain participation index (OECD, Eurostat) (2011)	44.57	↗ 46.34	Estonia 55.61 Finland 57.4
Inward FDI stock as % of GDP (UNCTAD)	n.a.	32.2	46.7

\* Estonia and Finland are used as benchmarks when an EU-28 average figure is not available

\*\*Position of Lithuania in 2010 data and trend direction 2010-latest available year

Figure 4: Internal competitiveness factors in the national innovation system

Competitiveness factors	Competitive strengths (++) , opportunities (+), weaknesses (-) and threats (--)
Endowments	<p>Limited scale of national market (-) (WEF)</p> <p>Declining and ageing population and significant net emigration (-)</p> <p>Groundwater and specific mineral resources (+) / absence of non-renewable energy sources (-) / significant biomass potential (++)</p> <p>Below average 'eco-innovation' performance<sup>2</sup> (inputs and outputs) despite improvements in environmental performance<sup>3</sup>(-)</p>
Internal demand and product markets	<p>Significant dependence on external (EU) investment funds (-)</p> <p>Strong private consumption growth (+) but negatively affected by rising inflation (-)</p> <p>Buyer sophistication is ranked relatively low, as is government procurement of advanced technological products (WEF) (-)</p> <p>Local supplier sophistication is ranked relatively high (WEF) (++)</p>
Cultural (entrepreneurial) framework	<p>Business birth rates are relatively high and ease of starting a business is near EU average (++)</p> <p>Share of SMEs innovating in-house is close to EU average (strong growth 2010-16) (EIS2017) (++)</p>
Education and	Declining number of students and high emigration rates of

<sup>2</sup> [http://www.eco-innovation.eu/images/stories/2015\\_country\\_reports/lithuania\\_eco-innovation\\_2015.pdf](http://www.eco-innovation.eu/images/stories/2015_country_reports/lithuania_eco-innovation_2015.pdf)

<sup>3</sup> <https://www.eea.europa.eu/soer-2015/countries/lithuania>

Competitiveness factors	Competitive strengths (++), opportunities (+), weaknesses (-) and threats (--)
research system	<p>graduates limit the potential pool of skilled staff (-)</p> <p>Above OECD average share of STEM graduates (+) but overall the availability of skilled human capital for innovation remains an important concern (--)</p> <p>Shift to performance-based funding of research since 2009 has improved performance but is uneven across scientific fields (+)</p> <p>Significant investment in new research infrastructure during 2007-13 (+) but insufficient resources allocated to research activities (-)</p> <p>Some consolidation of academic and public research organisations but lack of strategic approach to research priorities results in fragmentation (OECD, 2016) (-)</p>
Intermediaries and knowledge transfer	<p>Over-dense intermediary system with a plethora of science and technology parks, open access centres, clusters, etc. with insufficient business know-how among the staff (-)</p> <p>Equipment and skills base in research sector not adjusted to higher technology readiness levels (TRL) needs of business (prototyping, etc.) (-)</p> <p>OAC/interface structures in university mirror fragmentation of host organisations – need for further training and professionalisation (-)</p>
Company system and business demographics	<p>Significant growth in share of business services in value added but also a slight increase in manufacturing since mid-1990s; productivity growth has closed gap with OECD average but is lower in business services, and weak innovation capacities make it difficult to close productivity gap (OECD, 2016) (--)</p> <p>The share of employment in high-tech and knowledge-intensive sectors is relatively low, although improving (Eurostat) and there are limited business absorptive capacities (-)</p> <p>A few high-tech sub-sectors (biopharma, laser, specialist engineering) with sustained R&amp;D (+)</p> <p>Employment shifting towards more high-skilled occupations (+), but shortage of high-skilled (e.g. digital) workers, leading to wage pressure in ICT (allied to inflow of FDI in this field) and other service sectors (--)</p>
Financial system	<p>Banking sector is relatively stable and profitable, with high dependence on Nordic parent banks financing. Banks play primary role in funding business investment within a shallow local equity market. Although Lithuania ranks 8<sup>th</sup> in the EU for venture capital as a share of GDP, there is a shortage of sustainable well-functioning financing sources for business</p>

<b>Competitiveness factors</b>	<b>Competitive strengths (++) , opportunities (+), weaknesses (-) and threats (--)</b>
	development (meagre seed and venture capital) (-)
Political (policy) system	<p>Lack of a systemic STI policy approach together with often cumbersome procedures and weak co-ordination has led to a fragmented mix of policies (OECD, 2016) (--)</p> <p>Specific gaps in the policy mix concerning industry-research projects rendering funds devoted to inter-sectoral cooperation obsolete (-)</p> <p>Multiple agencies providing business and innovation support with limited coordination and providing complex system for firms to access (-)</p>
Regulation and taxation	<p>The main complaints in terms of doing business (WEF, 2016) concern tax rates and regulations and restrictive labour regulations as well as inefficient government bureaucracy. However, overall the institutional environment is not the main cause for concern (-)</p> <p>The R&amp;D tax-credit instrument does not provide a sufficient incentive to additional innovation-oriented investments for either nationally or foreign-owned firms (-)</p>

*Source: Background report unless otherwise indicated*

Figure 5: External competitiveness factors in the national innovation system

<b>Competitiveness area</b>	<b>Competitive strengths (++) , opportunities (+), weaknesses (-) and threats (--)</b>
Trends in global demand	<p>Export specialisations relative to the EU are in food, drink and tobacco, raw materials and fuels, and other manufactured goods (-)</p> <p>Recent development in ICT start-ups and FDI in business service centres may offer potential for better integration in digital services markets (+)</p> <p>OECD (2016) points to need for developing closer relationships with customers abroad to improve anticipation of market changes and technological learning (+)</p>
Sectoral trade patterns	<p>Exports (by value) are dominated by oil refining, furniture, tobacco and certain basic chemical products. Exports of high-technology products as a share of total exports are below half the EU-28 average and the share has stagnated since 2007. Level of economic complexity of exports has increased but remains very low (-)</p>
Foreign direct	<p>Greenfield investments dominate, while M&amp;As declined (2011-15). Three-quarters of FDI is concentrated in three main cities.</p>



Competitiveness area	Competitive strengths (++), opportunities (+), weaknesses (-) and threats (--)
investment	<p>Overall, FDI stock is relatively small and growth low compared to main competitors (-)</p> <p>Increasing investment (2010-15) in knowledge-intensive sectors (+) but significant drop in high-tech manufacturing FDI (-). Foreign affiliated firms tend to invest more and create more value added than domestic-owned firms (+) but performance relative to other countries is lower (-)</p>
Structure and dynamics of global value chains	<p>Multinationals generate 30 % of value added or three times EU-27 (2013) (++)</p> <p>Weak position in global value chains (GVC) and poor backward linkages (share of foreign value added in exports) (-)</p>
Availability of renewable and non-renewable global resources	<p>Improved interconnection with European energy networks (+) but need to anticipate future global resource constraints (--) by improving domestic resource efficiency (-)</p>
Policy and regulatory environment of main export and competitor countries	<p>Exports and imports are orientated towards neighbouring EU countries (Latvia, Estonia, Germany, Poland). UK and US each account for 5-6 % of exports<sup>4</sup>. Main country trade risk relates to Russia (--) plus potential BREXIT impact<sup>5</sup></p> <p>Limited use of innovative regulatory instruments or innovative public procurement as a source of attraction for FDI (-)</p>
International mobility and knowledge flows	<p>Low share of foreign students in tertiary education (2012, Eurostat) (-)</p> <p>Most immigrants are returning Lithuanians (86 % in 2013) and salaries in research are not competitive internationally (-)</p> <p>The number of international scientific co-publications rose significantly between 2010-2016 (EIS2017) and are now above the EU average (+).</p>

*Source: Background report unless otherwise indicated*

Evidence, summarised in Figure 4, of the internal competitiveness factors underlines that there has been a considerable restructuring of and investment in the business base and the higher education and public research system. However, the overall quality of output of this research system remains too low to be competitive on a European level. The external competitiveness factors,

<sup>4</sup> <http://atlas.media.mit.edu/en/profile/country/ltu/>

<sup>5</sup> <http://www.enterpriselithuania.com/en/news/news/brexit-potential-threats-and-opportunities-for-lithuanian-exporters/759>

summarised in Figure 5, underline Lithuania's relatively weak position on a range of factors, including export specialisation, exposure to international trade risks, position in global value chains, and small FDI stock that is performing relatively less well than competitor countries, plus significant difficulties in talent attraction and retention.

In terms of science-business cooperation, there are four main challenges:

- Science-business cooperation in Lithuania – in the form of structured applied R&D – is limited to a small number of niche, high-tech sectors (e.g. biopharmaceuticals, photonic and some ICT). Wider-scale science-business cooperation is hindered by a number of clearly identified and well-recognised barriers on both sides (spelt out in the background report). A first challenge is that the policy mix does not sufficiently address the key bottlenecks on either the 'supply' (science) or demand (business) side. In particular, there are specific gaps and inconsistencies in the policy measures designed to support science-business cooperation.
- On the science side, the significant investment, co-financed by the ESIF, since 2007, in research infrastructure (buildings and equipment) has not been matched by sufficient growth in the number and skills sets of the management, researchers and technicians in the OACs. In particular, OACs' applied research activities remain over-dependent on core funding from government budgetary funds despite limited growth in contract research (including testing and related services<sup>6</sup>) income. Most OACs have not been able to create more permanent and structured business partnerships which raises issues of future financial sustainability. Therefore, a second key challenge is to support and incentivise a more business-orientated strategy in the country's network of applied research facilities.
- On the business side, there is a need to build capacity (by which we mean skilled staff with skills and experience in designing and managing innovation processes) within a larger number of companies, across a broader range of sectors. In saying this, we recognise that the Lithuanian smart specialisation strategy seeks to concentrate investment in six priority areas (divided into 20 more specific priorities). However, evidence from the first round of joint science business calls underlines the highly variable capacities of businesses across the priority areas to design and develop R&I partnerships. Thus, a

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<sup>6</sup> The *OECD Frascati Manual* (2015, pp. 76-78) excludes testing and standardisation and feasibility studies, etc. from formal R&D for statistical purposes. In reality, it is often hard to distinguish these activities and, moreover, such activities are often those most in demand by businesses that are not yet engaged in more formal R&D projects. There is need for a greater clarity in what types of services are being provided by OACs, etc. as this would help understand the current demand from the business sector.

third challenge is to better identify and support more proactively businesses with the ambition or competitive need to innovate to develop the internal capacity they require to engage with and absorb knowledge.

- The fourth challenge concerns the highly fragmented nature of the 'bridging' and R&I advisory organisations in Lithuania. Past policy initiatives and decisions have created an 'ecosystem' of business support and funding agencies, science, education and business valleys, OACs, science and technology parks and over 50 clusters. The system is neither effective nor efficient and leads to a dispersion of public funding rather than the consolidation of investment and targeted support for sustainable and strategic innovation partnerships.

The situation in Lithuania is an example of the type of system dysfunctioning highlighted in the recent RISE group report where not enough attention is placed on the issue of "absorptive capacity<sup>7</sup>, which plays an important role in open innovation processes and in the diffusion of innovation between firms and throughout the economy" (Soete et al., 2017). A good absorptive capacity is very important for the diffusion of impacts from investing in research infrastructure and R&D projects (knowledge utilisation as well as knowledge generation). In turn, absorptive capacity depends on the quality of the knowledge to which firms have access and the quality of human resources. Therefore, the advisory services supporting business-research cooperation must be of sufficient quality and have enough industrial/market expertise to help firms to build this absorptive capacity.

In our view, the challenge of attracting more innovative FDI cannot be disconnected from the overall performance of the innovation system (e.g. availability of sufficient skilled staff or industrial testing and R&D capacity). Moreover, if the national suppliers and partners of foreign investment firms do not have sufficient capabilities to engage with the more advanced foreign know-how, the impact on technological diffusion and upgrading will be compromised. Therefore, policy interventions to secure new 'innovation-rich' investment or encourage follow-on investments from existing foreign investor firms must be twinned with measures to help Lithuanian suppliers and partners of these firms to improve their position in global value chains.

If attracting talent to tackle population decline is important, then Lithuania should focus primarily on how to encourage some of those highly educated Lithuanians who have emigrated for study or work in the last decade to return. As the RISE report underlines, transnational entrepreneurs, like successful

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<sup>7</sup> That is, the dual role R&D investment plays in a firm: it serves both to generate new knowledge and to increase the capacity of the firm to identify and use new external knowledge.

return migrants, have played a crucial role in early industry formation in certain places. More emphasis on marketing Lithuania as a location for new business-model demonstration projects and living labs (e.g. by creating 'top-runner' regulatory environments) could help to attract both foreign talent and investment to Lithuania. In the short-term, quick gains can be achieved by a shift of effort to better aftercare services for existing foreign investment, encouraging a shift to more innovation-intensive activities (an FDI 'Pareto Principle').

The remainder of this report is structured around a limited number of recommendations – grouped into three types: cross-cutting issues, science-business cooperation, and innovation-oriented FDI. For each recommendation, a brief analysis and rationale is followed by the detailed recommendation and operational steps required for implementation (in the short, medium and longer term). In the first section, we set out these recommendations concisely and then develop the operational steps required to implement them.

## **2 STRENGTHENING THE FOUNDATIONS OF THE POLICY SUPPORT SYSTEM**

As explained above, the expert team are of the opinion that there are currently a number of issues limiting the effectiveness of the overall policy system which require attention if our specific recommendations for improving science-business cooperation and innovative FDI are to achieve their aim.

First, the team concurs with the findings of the Organisation for Economic Co-operation and Development (OECD) that “the large number of agencies responsible for a plethora of schemes makes the R&D and innovation support system complex and difficult to access and use”. Paradoxically, while the evidence points to an over-fragmented agency structure as being a barrier to effective policy delivery, during our mission we heard of plans to create yet another agency to address the ‘hot topic’ of talent attraction. We advise the Government to avoid adding to the agency structure but rather to embark on a process of consolidating and rationalising the existing agencies. This reform would be in line with the business and innovation support structures of near neighbours (e.g. Innovation Norway, the Team Finland process leading to the merger of Tekes and FinPro into a single agency, and Enterprise Estonia which encompasses all business support in a single agency). Likewise, it would align with other similar-sized western European countries (Northern Ireland’s Invest Northern Ireland, and Scotland’s Scottish Enterprise which incorporates Scottish Development International and the Scottish Development Bank).

The second cross-cutting recommendation relates to the need to review and overhaul the financial incentives for businesses to invest in innovation and cooperate both with other enterprises and with Lithuania’s research infrastructures and centres. As noted above, the current set of incentives, including the R&D tax credit, do not appear to be sufficiently targeted and ‘user-friendly’ to encourage a significant increase in cooperation.

The reform of the agency structure should go hand in hand with a shift to more user-oriented segmentation of business support services, including the account management of selected groups of companies, in line with good practice among business support agencies elsewhere in Europe. This would also be coherent with a stronger emphasis on and a shift of resources towards ‘after-care’ for foreign investment companies with a view to embedding them in the innovation system and encouraging them to invest in and partner with Lithuanian R&I centres.

Figure 6: Recommendations to address cross-cutting policy challenges

Core recommendations	Timescale
Consolidate then rationalise the business support agencies structure, including investment, export and innovation functions	Phased transition from 2018
Overhaul the financial incentives for business innovation cooperation and investment (domestic and foreign owned) including the R&D tax credit	By 2018
Refocus investment and business cooperation advice towards a target group of growth companies independent of their economic sector	By 2019

## 2.1 Consolidation of business support agencies

### 2.1.1 Analysis and rationale

The structure and number of business support agencies is complex and fragmented with five agencies allocated specific missions related to specific policy goals (see **Figure 7**). Four out of the five agencies report to the Ministry of Economy while the fifth (MITA) reports to both the Ministry of Economy and the Ministry of Education and Science. In addition, the Lithuanian Innovation Centre (LIC)<sup>8</sup> (which counts among its shareholders the Ministry of Economy and the Ministry of Education and Science) also provides support to firms (including as part of the Enterprise Europe Network). The OECD (2016) considered that, on paper, the establishment of MITA was a promising development as regards horizontal coordination. However, the largest programmes for innovation, financed through the ESIF, are not managed by MITA but by the Central Project Management Agency (CPVA)<sup>9</sup> and the Lithuanian Business Support Agency. This limits MITA’s reach in the business sector.

During the interviews, the idea of creating another agency specifically dedicated to talent attraction was floated. However, as the OECD (2016) noted, the large number of agencies responsible for a plethora of support programmes and instruments makes the R&D and innovation support system fragmented and

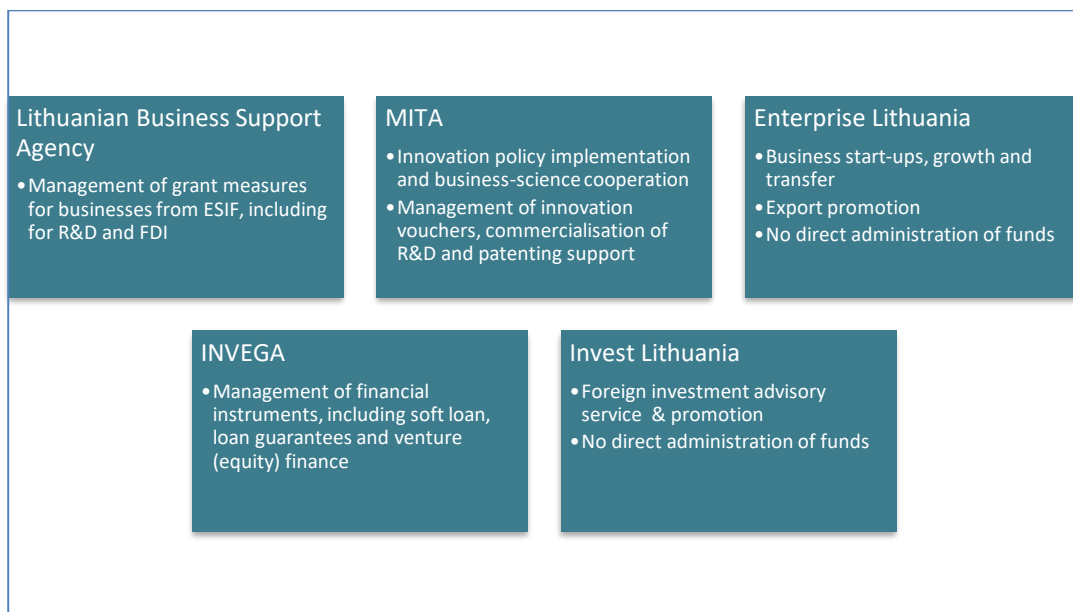
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<sup>8</sup> See: <http://lic.lt/en/lic/misija-ir-tikslai/>

<sup>9</sup> The CPVA is a legacy agency from the pre-accession funding period which has a role as a fund management and control agency; it does not have a specific mission to support businesses but rather manages the administrative and financial contracting, etc. for specific ESIF co-financed programmes <https://www.cpva.lt/en/about/history.html>

difficult for businesses to access and use. In our view, the effectiveness of the policy support can be increased by consolidating institutions and by support schemes, where overlaps exist, and by adopting a more industry and society need-based approach.

Figure 7: Main business support agencies



*Source: Authors, based on available information on agency websites*

In Lithuania, the missions currently spread across several agencies may, indeed, require specific expertise (e.g. the task of supporting national firms to export to a market is generally handled separately from the task of attracting inward investment from the same country) and may target different segments of the company base or organisations. However, in most advanced north-western European countries, there is a twin-track approach to business support:

- a) shifting emphasis from providing direct funding to individual businesses to organising the delivery of advice and fostering stronger 'business ecosystems';
- b) providing tailored and ongoing assistance to targeted groups of companies in line with their business change or growth strategies (account or client management).

In this type of model, the functions or missions (and corresponding budgets) delegated to business support agencies by government ministries are translated into a set of services targeting specific business needs, markets and types of

companies. Examples of this structured approach include Innovation Norway<sup>10</sup> and Invest Northern Ireland<sup>11</sup>. In both cases, these national agencies run a network of overseas offices and include a department for FDI.

In our view, the current Lithuanian agency structure does not deliver 'joined-up' and effective business support or foster improved business-science cooperation. We therefore recommend reducing fragmentation, clarifying operations and ensuring better coordination through a staged integration of the current agencies into a single new agency. We are aware that there are counter arguments and models for a single agency model.

The counter arguments include the fact that smaller, more focused organisations (targeting certain functions or types of companies) can be more efficient and focused on delivery, and the risk that a merger process will distract from delivery of services, etc. Our response is that efficiency and focused delivery does not depend on structure but on a coherent strategy. One agency to tackle every problem is not per se more effective and Lithuania's current agency system illustrates that more is not necessarily better.

During our consultations, the most-cited counter example was that of Enterprise Ireland<sup>12</sup> and IDA Ireland<sup>13</sup>. Enterprise Ireland supports the development of Irish manufacturing and internationally traded services companies (including start-ups from outside Ireland), as well as researchers in higher education institutions and public research institutes. It helps them to engage in collaborative research with enterprises, while IDA Ireland seeks to attract and support a range of overseas companies ranging from small high-growth businesses to large multinationals. However, while the enterprise support agencies perform reasonably well<sup>14</sup>, the model 'mimics' the dichotomous nature of the Irish economy, requiring the two agencies to work jointly to bridge the divide between domestic and multinational firms that exists in Ireland (OECD, 2013)<sup>15</sup>.

Our recommendation is based on the principle that the business support system requires a 'client'-orientated focus and service delivery model tailored to target groups of firms. Whether the process of implementing the recommendation

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<sup>10</sup> See: <http://www.innovasjon Norge.no/en/start-page/>

<sup>11</sup> See: <https://www.investni.com>

<sup>12</sup> See: <https://www.enterprise-ireland.com/en/>

<sup>13</sup> See: <http://www.idaireland.com>

<sup>14</sup> See, for instance, the 2017 Spending Review on 'An Assessment of the Rationale, Efficiency and Targeting of Supports in Enterprise Ireland' and the 2015 'Evaluation of State Supports for Enterprise in Ireland'.

<sup>15</sup> OECD Economic Survey of Ireland, 2013 (pp.96-97)



leads to a single agency (the Norwegian or Finnish approach), a nested agency (the Scottish Enterprise model where a single legal entity has several 'public personas') or a domestic firm-foreign investor dual agency model (the Irish model), is not ultimately the issue. Rather, in line with international best practice, the aim is a more effective, joined-up and timely system of business support with interventions tailored to each company.

### **2.1.2 Detailed recommendation**

We recommend that a single national business and innovation support agency, tentatively called 'Business Lithuania', be established. The aim is to achieve a step change in Lithuania's economic and innovation performance through the promotion and support of a limited number of transformative innovation platforms and by strategically targeting a limited number of companies with high potential for growth and value-added creation. The agency would be formed by the phased merger of the five existing agencies (Figure 7 above) and possibly a related organisation such as the LIC. The overall logic of our approach is summarised in **Figure 8** below, with a single new agency integrating five key lines of service and working with clusters, open access (applied research) centres and the proposed new Interface Lithuania (see chapter 3.4) initiative as 'extended arms' of the agency's core staff.

The Business Lithuania agency should aim to catalyse a step change in the innovation ecosystem with the following impact:

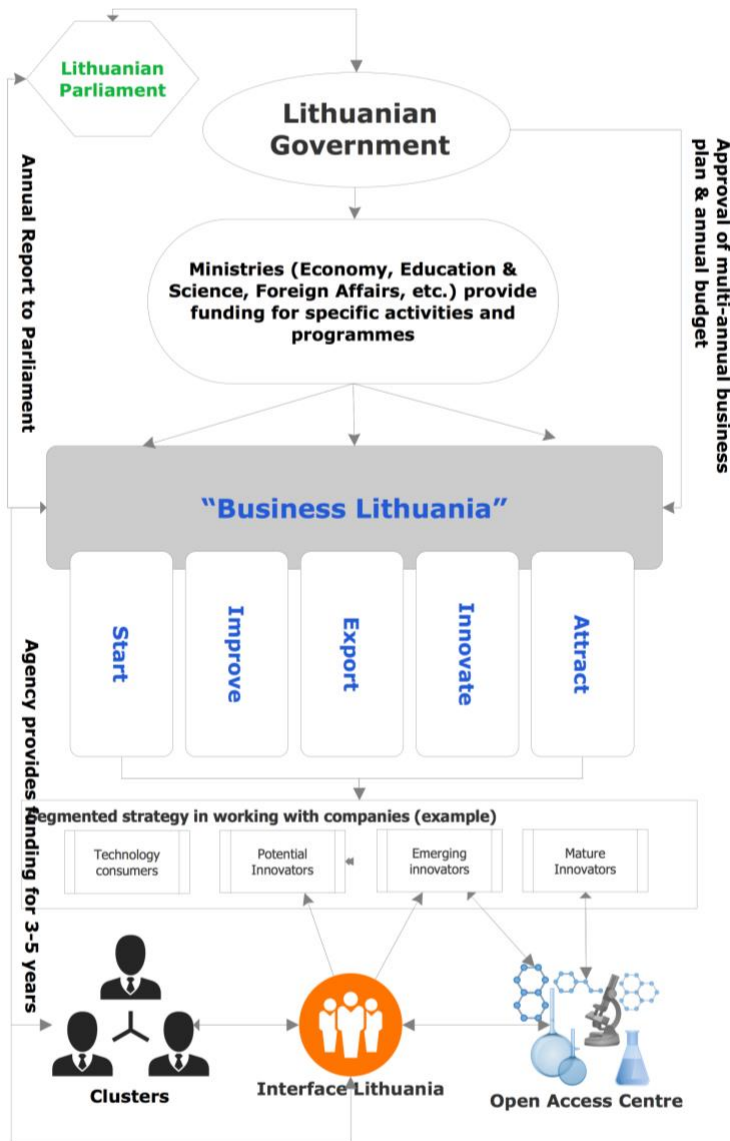
- Build Lithuania's reputation as an exciting and dynamic place of innovation, new business sector and creative solutions to social and economic challenges;
- Increase innovation capacity, capability and skills for people, businesses and organisations within Lithuania by encouraging collaboration;
- Take over the management of all relevant business support;
- Provide a strong voice for Lithuania's innovation ecosystem, facilitating dialogue with Nordic-Baltic, EU and global partners;
- Market Lithuania's innovations internationally while attracting relevant investors from across the world;
- Drive public service innovation and social innovation by leveraging-in and supporting the development of innovative platforms that are transformative and respond to current and future economic and social challenges;
- Improve economic performance, well-being and prosperity over the long term.

We recommend that Business Lithuania should be given the appropriate autonomy of action and sufficient authority to establish an operational model

and achieve an agreed set of goals over a three to five-year period (with a funding commitment for the operational budget for this period). The agency, its board and executive team should be given clear functions, roles and responsibilities so that its authority is clear and can be communicated widely and transparently to stakeholders and partners.

The agency would report to a board appointed by the prime minister with cross-cutting competences and with a majority of members drawn from business or financial sectors and appointed for a five-year term. We agree with the OECD recommendation that such a merger should be accompanied by the establishment of a common information platform for tracking account-managed companies as well as monitoring applicants and beneficiaries of R&D and innovation support across schemes.

Figure 8: Proposed new agency framework (simplified overview)



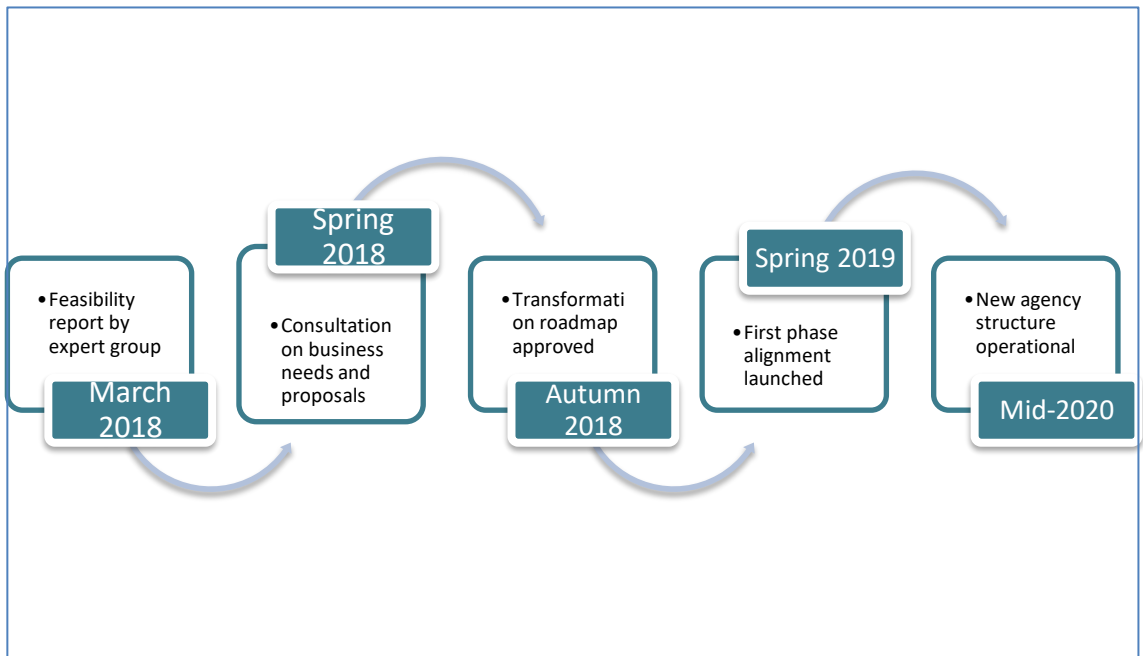
To minimise overlaps and duplication of functions, we recommend that a clear distinction is made between agencies responsible for collaborative R&I, on the one hand, and basic research funding, on the other. In practice, Business Lithuania, by absorbing MITA, would be responsible for all funding for applied R&D and business-science collaboration, irrespective of the beneficiaries (companies or research institutes).

### 2.1.3 Key operational steps and timeline

By launching the process of consolidating the business agencies from spring 2018, the aim would be to complete the process before the beginning of the new programming period in 2021. We suggest starting with an in-depth review of the existing agencies during spring 2018 in order to review various options and develop an initial proposal for a consolidation roadmap that would allow for a phased integration of the agencies.

As part of the process of developing the new agency structure and strategy, we suggest undertaking a broad consultation of business leaders as well as other associated stakeholders (cluster managers, S&T parks, innovation centres, etc.). It would also be advisable to consult with and examine agency management and delivery models in selected north-west European countries (e.g. Norway, Finland, Estonia, Scotland and Ireland).

Figure 9: Timeline for consolidation of business support agencies



In a second step, a roadmap for the phased merger of the existing agencies should be developed to provide a business case (plan) and recommendations to the government, relevant ministers and the parliament to ensure broad-based, non-partisan support and commitment to the principle of creating a single agency. Once the roadmap has been agreed, a detailed business plan, including budgets, role specifications and a roll-out plan will have to be drafted and approved.

The five service lines proposed (start, improve/grow, export, innovate and attract) cover standard steps in a business growth process. However, we advise against a procedure that would see the existing agencies continue to 'live on' as five departments of the new agency. Rather, the organisational structure should be carefully thought through as to how best to deliver services and support to businesses via funding programmes and account management in key growth companies. A cross-department 'team' approach might be one method whereby staff would report to a specific department (e.g. export promotion, foreign investment or innovation) but would also be part of cross-departmental teams working on specific themes (e.g. the smart specialisation priorities) or short-term strategic projects (e.g. developing a pilot innovation platform involving Lithuanian companies, researchers and foreign investors).

In spring 2019, the transition to a single agency should begin, including the appointment of a transition board and an executive management team to oversee the merger. It is likely that specialist professional advice and leadership will be required for developing the new agency's final name and branding.

## ***2.2 Segmentation and targeting of support to companies with growth potential***

### **2.2.1 Analysis and rationale**

The need for a more targeted approach to supporting business growth, innovation and cooperation in Lithuania is manifest from the background report and previous OECD review. The number of firms currently conducting formal R&D in Lithuania is limited so the challenge is to increase the number of innovators (broad definition from non-technological to technological innovation and process, product and service, etc.). In this context, the issue is to adopt what the OECD 2016 called customer-oriented approaches that target individual companies and support them to move along a business-growth trajectory or up an innovation ladder.

As the background report outlines, the potential innovators (and hence possible clients for services provided by applied R&D centres from the public and academic sector) are largely from the more traditional industries and 'emerging innovators'. A key limitation concerns in-house skills and the capacity to understand and adopt new technologies. The background report outlines one possible segmentation of the current business base in Lithuania (see Table 1 in Palokaitė, 2017) into technology consumers, potential innovators, emerging/new innovators and mature innovators.

Business support agencies need to target the limited (financial and human) resources they have as effectively as possible to work with those enterprises

(whether domestically or foreign owned) that are most likely to generate the type of impact expected by government policy. This process is not unlike that which companies undertake when considering how to leverage the optimal value from their own markets. Customer segmentation requires business support agencies to:

- Divide the market into meaningful and measurable segments according to customers' needs, their past behaviour or their demographic profiles;
- Determine the profit potential of each segment by analysing the revenue and cost impact of serving each segment;
- Target segments according to their profit potential and the company's ability to serve them in a proprietary way;
- Invest resources to tailor product, service, marketing and distribution programmes to match the needs of each target segment;
- Measure performance of each segment and adjust the segmentation approach over time as market conditions change decision-making throughout the organisation;
- Refocus investment and business cooperation advice towards a target group of growth companies independent of their economic sector.

In short, business support agencies seek to identify an enterprise's ambition and readiness for change before embarking on a process of targeted advice to selected companies, helping them to make best use of the various instruments and to climb the ladder (see OCED 2016, page 15 for an example).

### **2.2.2 Detailed recommendation**

In the case of public (or publicly funded) business support (enterprise or innovation) agencies, segmentation implies that an agency looks at the base of companies it wishes to influence and breaks them down according to a set of characteristics. This process leads to a differentiated offer, per target segment, tailored to maximise the impact and be more responsive to each set of clients. Segmentation also enables an agency to tailor its support to specific targeted needs within a segment, which hopefully, in turn, increases the efficiency of the support provided.

Interest in segmenting the client base can be justified on several grounds:

- By adapting interventions for specific client communities it is possible to maximise the impact and make better use of resources;

- This approach forces the agency to be very clear about client needs in a given segment and the barriers to growth which exist for them;
- Having this level of information also enables more client-specific impact metrics to be set for evaluation frameworks;
- Business models have shifted from being discrete silos (technology, marketing, sales, etc.) into a more unified approach whereby competitive advantage depends on more complex business models with a mix of products and services, etc. Segmentation is one way to target interventions in a rapidly changing landscape.

However, segmentation is not without problems (see Inno-Partnering Forum, IPF, 2013) and a number of challenges must be overcome to fully realise the tool's potential:

- If the support agencies are not able to establish a common service model (e.g. if support agencies in the national system do not work together efficiently towards a specific segment), this leads to a proliferation of support programmes which become confusing for clients;
- New interventions focused on the needs of particular groups of companies can be resource intensive in terms of finance and staff time. They can also require a new mix of skills within agencies;
- Many agencies see the broad base of industry as their clients, promoting programmes openly and seeking to control participation through eligibility criteria. This becomes much more difficult when a segmentation approach is taken, unless there is a specific client base on which to focus;
- The national context could also have a significant impact on the applicability of segmented approaches. The size of economies and the number of enterprises is likely to have an impact on the ability to segment the customer base. Furthermore, in some contexts, the political and competitive environment in which government support is delivered may create challenges for segmented approaches.

However, segmenting companies simply because a group of businesses employs under 50 or under 250 people, etc. is not a sufficiently robust criterion for attributing firms to an economically distinctive segment. Indeed, based on a literature review of business agency segmentation strategies, Blackburn (2012) notes that: "the evidence suggests that segmentation needs to be based on customer requirements rather than merely relying on administrative definitions by size, sector, etc. Whilst the latter may be useful for the purposes of measuring the size of the SME marketplace, they are rather rudimentary for the development of an SME segmentation strategy."

Atherton and Lyon (2001) summarised the possible segmentation approaches of business support agencies into four broad groups.

Figure 10: Segmenting the enterprise base

Category / characteristic	Criteria
Personal characteristics of the entrepreneur involved or being targeted	<ul style="list-style-type: none"> <li>- Experience of the founder</li> <li>- Personality of the individual entrepreneur</li> <li>- Motivation to start a business</li> <li>- Type of entrepreneurial activity undertaken: portfolio or parallel, serial, single</li> <li>- Venture-focused</li> <li>- Education and skill level</li> <li>- Ethnicity</li> <li>- Gender</li> <li>- Age</li> <li>- Disability</li> <li>- Unemployment</li> </ul>
Characteristics of the business	<ul style="list-style-type: none"> <li>- Size</li> <li>- Stage of development or life cycle</li> <li>- Type of entrepreneurial business activity: lifestyle, survivalist, limited growth, high potential</li> <li>- Performance</li> <li>- Economic sector</li> <li>- Non-economic sector: cooperatives, social enterprises, community enterprises, public enterprises</li> <li>- Origin: indigenous, foreign, incoming</li> <li>- Industry sector</li> <li>- Age of business</li> <li>- Location</li> <li>- Industry environment and dynamics</li> <li>- Formal or informal businesses</li> </ul>
Activities and processes undertaken within and by the business	<ul style="list-style-type: none"> <li>- Market development, including international market development and internationalisation</li> <li>- Business function, including human resource management; quality management</li> <li>- Information technology; marketing; research and development; and strategy</li> <li>- Technology and innovation</li> <li>- Take-up of support</li> </ul>



Category / characteristic	Criteria
	<ul style="list-style-type: none"> <li>– Type of support used</li> <li>– Patterns of use</li> <li>– Provider perspective</li> <li>– Nature of support offered</li> <li>– Forms of business-to-business collaboration</li> <li>– Business processes</li> <li>– Business performance stance or strategy</li> </ul>
Business support needs	<ul style="list-style-type: none"> <li>– By type of resource, or 'capital', needed: human, social, organisational, physical, or financial</li> <li>– Based on a specific incident or experience, focusing on: a specific problem, a particular crisis, or an identifiable opportunity.</li> </ul>

*Source: Adapted from Atherton and Lyon (2001)*

We consider that business support must be based on a detailed segmentation and thereby an in-depth understanding of the real needs of businesses. This could be achieved by a four-step approach to segmenting enterprises in the agency's client base:

- A first step segments the client base given the policy objectives for the support:
  - the objectives of the support – this could take account of both overall policy aims such as raising innovation activity, BERD, etc. but also the smart specialisation priorities;
  - the type of businesses that contribute to the support objectives;
  - the performance characteristics that influence the likely contribution of the enterprise to the policy objectives;
  - the industry or market conditions that influence business performance.
- In a second step, a service or engagement model is designed describing the approach used to create and deliver value to the firms in a given segment. The service model is the basis for connecting the outcomes and segments with a value proposition that describes the added value (or additionality) the agency offers a company and how the agency intends to improve the capability and capacity of the customer segment.
- The next step involves two building blocks that support the value proposition towards firms:
  - business relationships that describe how the agency establishes and maintains relationships with firms in the given segment;

- service delivery/channels which describe how the agency communicates with and reaches the businesses in order to deliver the value proposition.
- The last step involves addressing the operational support:
  - key activities that describe the most important activities the agency must undertake to make the service/engagement model work;
  - key resources which describe the most important assets required to make the service/engagement model work. This could involve human resources/skills, money, infrastructure/networks, etc.
  - key partnerships that describe the network of suppliers and partners that make the service model work.

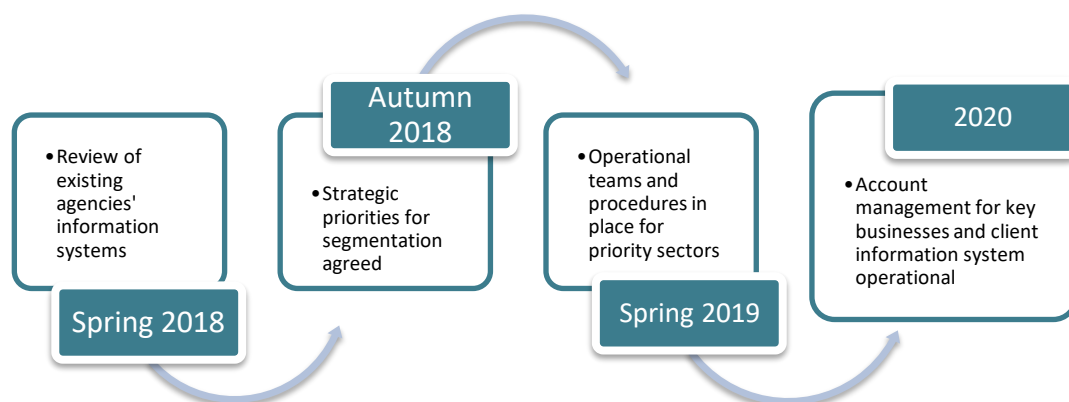
This four-step process is one way to build up a more sophisticated segmentation of the client base that could serve as a model for the new business support agency as it draws up a first strategic plan.

### **2.2.3 Key operational steps and timeline**

The shift towards a business support system that places greater emphasis on fostering businesses' strategic ambition, including account management for selected companies with growth potential from the company base, should go hand in hand with the consolidation of the business support agencies and the development of a robust management (client) information system.

However, since neither can happen as a 'big bang', it will be necessary to phase in the changes over a two to three-year period. Currently, none of the agencies are effectively operating any form of segmentation or account management and, indeed, a key critique is the lack of in-house expertise on business and industrial needs.

Figure 11: Timeline for account management system for business support



Not all client firms in the Business Lithuania agency will be account managed as the existing grant schemes will continue to be open to 'all-comers'. The agency will manage the 'legacy' programmes and financial measures inherited from the merged agencies, but will seek to begin a transition towards more targeted support, including 'after-sales' services to selected businesses. With a view to greater transparency, an open data approach should be put in place so that all grant funding and non-grant equivalent support is made available online every quarter.

## **2.3 Overhaul the incentives for innovation investment and cooperation**

### **2.3.1 Analysis and rationale**

Financial incentives are important and can be a differentiator for both domestic and foreign investors, but they are only one of many factors. To put it another way, "incentives are the cherry on the cake". The feedback from companies is that whilst a good range of instruments are available, the process for applying for them is bureaucratic, time consuming and costly, with an uncertain outcome (e.g. for foreign investors).

In terms of business-science cooperation, the lack of a (real) collaborative programme is a significant gap in the system. Similarly, plans to develop industrial PhD programmes have not come to fruition; this is a key mechanism

whereby companies can create better linkages with the HEI/PRO sector while benefiting from research on specific industrial challenges or opportunities. Some universities do have industrial internships built into their degree programmes but these are generally short term (e.g. KTU requires students to do a 10-week internship). Several companies interviewed noted that they were cooperating with universities by supporting teaching and providing them with equipment so that students can get an insight into operational reality – this could be promoted more as a means of improving interaction.

Given the trend to shift from grants to financial instruments that enable a 'recycling' of ESIF, new forms of financial engineering support are being developed by INVEGA. These include a EUR 5 million seed fund targeting university spin-offs with support from the ESIF, which would complement other existing venture capital funds that tend to be aimed at early-stage and growth firms in existing product or service markets. Working capital is a real issue for smaller and start-up companies carrying out product development, and several pointed that their experience of applying to funding agencies is that it is difficult to secure the necessary funding for development. While there are some successful measures that have helped shift the focus towards applied research, in general, the measures do not provide enough incentive for joint cooperation.

Adaptations to the mix of instruments supporting science-industry collaboration also play a role. Existing instruments are perceived as either being too small/short-term to be attractive for researchers (e.g. innovation vouchers), or too big and focused on basic research/early TRL phases to be attractive for most Lithuanian companies (e.g. Intelektas). There is a demand for more integrated packages of instruments that support the progressive development of science-business collaboration over time (discussed above). Universities experience difficulties in leveraging current instruments that support broader collaborative efforts (e.g. groups of companies and universities), as universities are considered as a company (requiring co-financing). A key issue raised both with respect to university-industry collaboration and new financial engineering instruments was the strict interpretation and application of EU state aid rules (also covered in other sections), with universities unusually being considered as large enterprises for R&D funding measures, while firms receiving equity funding through supported venture capital (VC) and seed funds are then refused grant aid as they are classified as being part of a larger undertaking (*de minimis* rule).

There is a consensus that the R&D tax credit system<sup>16</sup> is not working effectively and most companies find the scheme too burdensome and costly to apply for<sup>17</sup>.

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<sup>16</sup> See: <https://www.oecd.org/sti/rd-tax-incentives-compendium.pdf>, page 124 for details.

Aside from the difficulty firms find in securing the credit (three times the value of R&D expenses), another factor that might play a part is that the low rate of profit tax (15 %) means that firms are less likely to apply for R&D tax credits due to the relatively low rates of R&D spend, and that those which do spend more are often not making a profit (spin-offs) so the credit is not relevant. Those companies (notably in life sciences) that have been able to access tax credit consider it a critical differentiator and selling point for Lithuania as an R&D location. At the other extreme, one corporate stakeholder described the scheme as “totally useless”. The key points are that the process is considered to be complicated, unclear and inconsistently interpreted by tax authorities. There is a perception that the interpretation of rules is overly strict. This can cause problems for Invest Lithuania’s work when investors expect to qualify for the instruments/tax relief and are then refused. Another stakeholder comment was that the incentives on offer are great for larger companies but much less suited to smaller foreign investors and for “riskier” investments such as in the biotechnology field. There has been interest and some uptake of Smart Specialisation LT+ by foreign investors, one of them citing it as one of the key reasons why it chose Lithuania.

### **2.3.2 Detailed recommendation**

We recommend that, with a view to both the mid-term revision of the ESIF programmes and in preparation for the next programming period, an overall review should be conducted of the financial incentives for business-science cooperation, and innovation-oriented investment by businesses (domestic and foreign owned), including the R&D tax credit.

First, we recommend that greater priority be given to funding collaborative projects both through bilateral ‘commercialisation’ projects as well as in the form of ‘innovation platforms and pilots’ (involving several companies, research institutes and public authorities in the joint development or testing of technologies) that are of sufficient scale to generate ‘transformative’ economic change (e.g. linked to smart specialisation priorities). In our view, this implies the need for two key changes:

Integration of a collaboration element in most R&D and innovation instruments, which could involve additional percentage points of financial assistance for projects involving partnerships (domestic business and foreign investors, business-research institute, or public-private partnerships);

A review of the targeted instruments for commercialisation to ensure they encourage appropriate co-investment by business and science stakeholders

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<sup>17</sup> See also: [https://www2.deloitte.com/content/dam/Deloitte/lt/Documents/tax/LT\\_Lithuania\\_R&D\\_2016.pdf](https://www2.deloitte.com/content/dam/Deloitte/lt/Documents/tax/LT_Lithuania_R&D_2016.pdf)

(with a greater emphasis given to commercialisation in performance-based funding for researchers).

Secondly, we are concerned about the restrictive (compared to other countries) interpretation and the non-optimal application of state-aid rules in relation to collaborative projects and for certain financial engineering schemes. We are aware that the European Commission services (DG R&I and DG REGIO) have offered to provide expert support to review the current interpretation in more detail. Ideally, the review should be based on a comparative assessment of the application of the General Block Exemption Regulation (GBER)<sup>18</sup> and RDI Frameworks in Lithuania and three to four 'more advanced' European countries (e.g. Finland, Ireland, Scotland, Netherlands). The review should make specific recommendations to improve the current application of state aid for R&I in Lithuania, such as the definition of large enterprises, 'independent research', bonus for collaboration, etc. The findings should be used to inform the implementation (or rationalisation) of existing and the launch of new schemes for business-science cooperation.

In terms of innovation-oriented FDI, although tax incentives and investment and R&D grants are attractive instruments for foreign investors, they need to be applied consistently. We consider there is an obvious need to make these more visible, clearer, easier to apply for and to speed up the process. It is also important that there is consistent long-term interpretation of tax incentive rules. In short, there is a need for a simplification and consistency of applications and the processing of financial instruments. From an innovative FDI perspective, this should be a significant and attractive selling point for foreign investors. On paper, it is a very generous scheme. Life sciences companies have greatly benefited from this but there is little evidence that this is the case in other sectors. We strongly recommend that this R&D tax credit is only marketed and presented to investors when it is very clear that such companies are likely to qualify for it.

The R&D tax credit should be overhauled: we recommend a review of the administration and application process and the development of very clear guidance on eligibility. This review can draw on a broad base of international evidence on R&D tax credits. The OECD has recently summarised the evidence on R&D tax incentives<sup>19</sup> and a PSF Mutual Learning Exercise has compiled evidence on the Administration and Monitoring of R&D Tax Incentives<sup>20</sup>. These

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<sup>18</sup> [http://ec.europa.eu/competition/state\\_aid/legislation/block.html](http://ec.europa.eu/competition/state_aid/legislation/block.html)

<sup>19</sup> See: Appelt, S. et al. (2016), "R&D Tax Incentives: Evidence on design, incidence and impacts", OECD Science, Technology and Industry Policy Papers, No. 32, OECD Publishing, Paris: <http://dx.doi.org/10.1787/5jlr8f1dqk7j-en>

<sup>20</sup> See: <https://rio.jrc.ec.europa.eu/en/policy-support-facility/mle-administration-and-monitoring-rd-tax-incentives>

reviews point to a number of issues that should be considered in revising the current Lithuanian R&D tax credit scheme, such as:

- Ensuring R&D tax credits are adapted to the needs of smaller/younger innovative firms lacking the profit-generating capacity on which to realise allowances or credits (e.g. carry-forward provisions, cash refunds or reductions in social security/payroll taxes);
- Ensuring that the broader taxation regime is stable and predictable to guarantee a longer run and stronger impact on R&D investment;
- Simply the definitions of eligible costs to reduce the administrative burden and consider the option to adopt an *ex-ante* eligibility control, notably for major inward R&D investment projects;
- Enhance outreach efforts to explain the R&D tax incentives to a broader base of business and ensure that applications by companies do not lead them to incur significant auditing or consulting costs.

Finally, the R&D tax credit should be regularly evaluated (e.g. in Ireland, a methodology has been developed and a review of the impact is carried out every two years<sup>21</sup>), and a user survey fed into a periodic review and adjustment of the eligibility and administrative procedures.

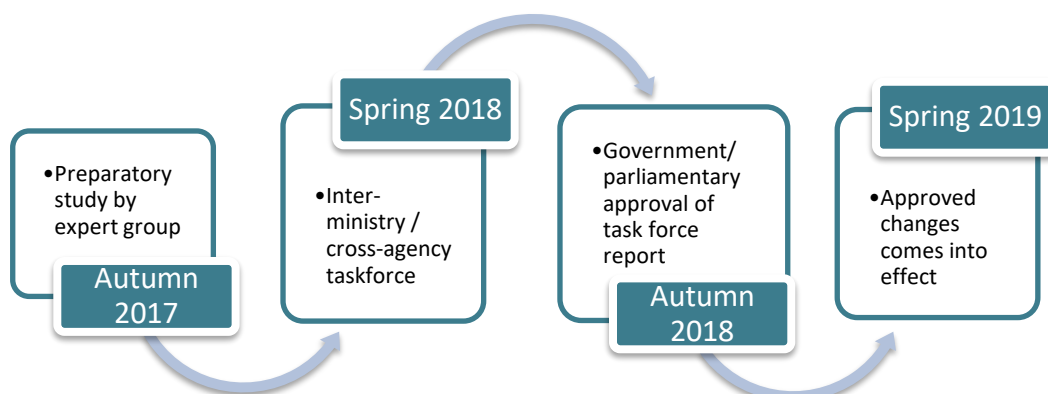
### **2.3.3 Key operational steps and timeline**

It is recommended that a preparatory study, including benchmarking with other more advanced countries' business support systems, should be undertaken to assess and review the current criteria for awarding support, including the related state aid rules. Based on this study's findings, an inter-ministry/cross-agency taskforce could be set up to review the existing schemes and recommend the termination, fusion or revision of current programmes (in line with the evolving roadmap for the merger of business support agencies). Following parliamentary approval, the revised set of funding instruments would come into force in 2019. A forward-looking evaluation of the 2014-2020 period business innovation and business-research funding schemes should be commissioned to report in 2019 with a view to preparing the policy mix for the next period.

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<sup>21</sup> See: <http://igees.gov.ie/publications/policy-evaluation/tax-policy/>

Figure 12: Timeline for review of financial support for innovation and cooperation



### 3 FOSTERING COOPERATION BETWEEN THE SCIENCE BASE AND BUSINESS

Policies to support collaboration between science and business sectors are an integral part of innovation and growth strategies around the world. This segment of policies focuses on addressing market and system failures, increasing knowledge exchange between actors/actor groups, and speeding up innovation processes.

The rationale for collaborative support mechanisms has evolved over time, from 'technology transfer' objectives (which sought to directly transfer the results of public-sector research into products, process and services that can be commercialised – based on a linear model of innovation) towards 'knowledge transfer' objectives (which aim to optimise a broader range of innovation characteristics that are embodied in the systemic view of innovation and which involve less tangible interactions and feedback loops between the actors engaged)<sup>22</sup>. This has had an effect on the design of policies to support collaboration – moving from short-term, project-oriented instruments, to longer-term, platforms (or other institutional forms) for collaborative action.

Based on an international review of cluster (and other collaborative innovation) programmes, common objectives and characteristics of current collaborative support policies include:

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<sup>22</sup> See, e.g. NESTA (2012), *The Impact and Effectiveness of Policies to Support Collaboration for R&D and Innovation*



Objectives of collaborative support policies	Characteristics of collaborative innovation platforms (e.g. cluster initiatives)
Strengthen public-private collaboration and capacity in areas with a strategic potential	Engagement or mobilisation of a critical mass of key actors from industry, academia and public sector; new configurations (based on technologies, societal challenges, S3 priorities etc.; not just sectors or key research areas)
Develop channels for flow (and use) of knowledge between public research organisations and enterprises – accelerating innovation processes	Organised efforts; proactive facilitation and coordination; neutral platforms/institutions/ supporting infrastructure for collaboration
Conduct problem-focused R&I – leading to economic and social returns	Aims for the collaborative effort (e.g. labour/skills building, R&D, international linkages and visibility) driven by industry and societal needs
Develop strategic partnerships (ecosystems) that boost innovative strengths	Long-term strategic agenda, focused on renewal/transformation and sustainable growth; network-based organisational structures or partnership models
Strengthen international visibility and global competitiveness	Integration of activities to strengthen international linkages, talent and investment attraction, export promotion, etc.

Source: Authors

In Lithuania, outside of universities and research institutes, the institutions mandated with supporting research-industry collaboration (referred to as public R&D infrastructure – RIs – in the background report) are the 'Integrated science, studies and business centres – valleys', OACs, Science and Technology Parks (STPs), and clusters. In addition to the policies supporting collaborative innovation platforms (or RIs), there are a number of other instruments (including the Intellect joint science-business projects<sup>23</sup> and innovation vouchers) that foster research-industry collaboration on a shorter-term, project basis – as well as university-driven activities (through technology transfer offices, etc.).

Policy initiatives have resulted in a diverse landscape of collaborative platforms for R&I (including five valleys, 25 OACs, eight STPs and 52 clusters) across

<sup>23</sup> <https://rio.jrc.ec.europa.eu/en/library/intellect-lt-joint-science-business-projects>

Lithuania, with different areas of specialisation, organisational forms, operational approaches, targets/KPIs and funding models.

Despite efforts to establish platforms and other support mechanisms to facilitate business-science collaboration in Lithuania, low levels of enterprise engagement with these initiatives and low levels of collaboration remain. This is due to a number of factors:

- Many OACs/STPs/clusters lack critical mass, including a dynamic ecosystem of companies (including international companies), and involvement of local/regional public-sector actors;
- Many OACs/STPs/clusters also lack a longer-term vision and direction for collaborative action, driven by industry needs;
- Although there are some examples of coordinated efforts (between clusters, OACs, STPs), there is an apparent lack of coordination and integration of collaborative efforts across the different platforms operating in the same field of specialisation;
- Investments have been focused on developing research infrastructure. Collaborative platforms lack 'boundary spanning' capacity – i.e. individuals/facilitators to proactively engage with industry and services that are tailored to industry needs (including the use of research infrastructure);
- Many collaborative platforms are based within larger research organisations (as against operating as an independent/neutral entity) – influencing the operating mindset and governance (steering and funding) models;
- It is not obvious how companies could benefit from various government support measures over time in order to develop their R&D and innovation competences. Thus, policies operate in isolation from each other instead of being used as an integrated package – helping to upgrade R&I activities in collaborative systems.

There are three main challenges related to the effectiveness of science-business cooperation policies: a lack of policy instruments which address industry needs (across all development phases) and that are designed and implemented as an integrated package; fragmentation and lack of strategic orientation of the collaborative platforms; and a lack of professional boundary-spanning capacity to coordinate and facilitate collaborative efforts.

To address the demand for policy instruments that are better tailored to industry needs, the expert group recommends introducing innovation voucher follow-on awards and perhaps an industrial fellowship scheme, as well as possible 'funding modules' (earmarked for collaborative projects between industry and research actors) as part of the cluster programme.

To address the fragmentation and lack of strategic orientation of the existing collaborative platforms, the expert group recommends undertaking a strategic review of operations and financing of OACs and Technology Transfer Offices (TTOs), as well as developing stronger and more internationally visible cluster initiatives (by applying stricter criteria and ensuring operational partnerships with STPs and collaborative research infrastructures).

To address the need for professional boundary-spanning capacity, the expert group recommends a service contract for the creation of a single national interface structure, as well as further efforts to strengthen operations within TTOs and cluster organisations.

Figure 13: Main recommendations for business-science cooperation

Core recommendations	Timescale
Introduce innovation voucher follow-on awards to foster successful business-science partnerships	In 2018
Implement a new financing model for applied research and other services to business provided by universities and state research institutes	From 2019
Develop stronger, more internationally visible and professional cluster initiatives	By 2018
Create a single national interface structure (staffed by industrially experienced staff) to ensure proactive engagement with business	By 2019

### **3.1 Innovation voucher follow on awards**

#### **3.1.1 Analysis and rationale**

As discussed in the background report, the Lithuanian economic structure (specialisation in low-to-medium tech and labour-intensive business sectors) is not conducive to a high level of business expenditure on R&D. The main mode of 'knowledge acquisition' (70 % of innovation expenditure) is tangible (acquisition of machinery and equipment) investment, even if there has been a recent growth in the intensity of non-R&D innovation (improvements in design, brand creation or process optimisation). Business cooperation with researchers tends to be on a bilateral basis and often with individual researchers (rather than through TTOs, OAC staff or cluster managers). On average, the scale of (technical testing, etc. rather than R&D) services contracted by firms from HEIs or PROs is small, with an average contract of EUR 1000-2000.

Despite criticism of the overly burdensome bureaucracy of the innovation vouchers scheme, this was highlighted by a range of stakeholders (from

policymakers to business people) as an important element in stimulating businesses to develop innovation projects and collaborate with technical expertise available in the HEI or PROs. As one interviewee noted: “they develop a culture of collaboration”. From the policy perspective, the scheme aims to support business projects on the TRL scale from 6-7, and while EUR 5000 is not a substantial amount, it does finance the drafting of a feasibility study. OACs were expected to play a role as an entry point to HEI/PRO expertise but have been unable to fulfil this role. Instead, companies have been left to choose ‘suppliers’ from a list of technical and research services. Around a third of the cooperation initiated by the voucher scheme has led to a follow-up cooperation although tracking such ongoing cooperation has been difficult. There are some successful examples of smaller companies involved in the innovation voucher scheme which have then applied for further support from the Intellect programme, etc.

Although innovation vouchers help develop a culture for collaboration, feedback from the business sector emphasises that the current policy measures are not sufficient to incentivise intensified and recurrent R&I activities. There is a need for additional, follow-up measures to take successful results from an initial trial or feasibility study to the next level to enable further development of a product, service or technology.

A key issue requiring specific attention concerns managerial skills sets on both sides of business-industry partnerships. On the business side, the older generation of managers may lack the required skills to restructure a business and put new production processes in place, while younger managers may have insights on new business models but often lack the operational experience. At the same time, the business sector expressed concern about the ‘translational capacity’ and R&D management/governance know-how (e.g. related to intellectual property (IP) of academic and public research staff. Such ‘skills gaps’ can be a major barrier to effective cooperation and should be addressed through enhanced staff exchange (e.g. industrial PhDs) and tailored support to business model and innovation management in firms. For instance, in the Basque Country region (Spain), the SPRI agency manages the Innobideak Strategy which offers a suite of advanced management and business model and change advisory support<sup>24</sup> to companies that are often the precursor to new collaborative (cluster or business-research) cooperation and investments.

### **3.1.2 Detailed recommendation**

To provide the possibility to build on successful initial cooperation between business and researchers, the expert team recommends **introducing**

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<sup>24</sup> <http://www.spri.eus/en/innovation/the-innobideak-strategy/>

**innovation voucher follow-on awards** (e.g. EUR 30-50k) to encourage firms to go beyond the stage of feasibility studies and to develop cooperation with firms. Such follow-on awards would aim at:

- encouraging existing partnerships that have previously collaborated and jointly received funding;
- continuing to leverage matching commitment (in funds and/or time) from the company;
- funding more ambitious (and longer-term) development activities, such as:
  - consulting on product or service development, production or technology
  - conducting product tests and industrial experiments
  - development and implementation of technological solutions
  - legal protection consultation, tests and registration regarding patents, utility models or industrial design.

The follow-on award could be modelled on similar support mechanisms in Scotland<sup>25</sup> and Estonia<sup>26</sup>.

In addition, the expert team recommends **considering the introduction of an industrial fellowship scheme** to help firms recruit specialised R&D and innovation managers for project delivery, and to support the development of academia’s translational capacity. Inspiration for such a scheme (linked to ‘standard’ innovation vouchers) could be drawn from the student placement vouchers administered by Interface Scotland.

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<sup>25</sup> <http://www.interface-online.org.uk/how-we-can-help/funding/follow-innovation-vouchers>

<sup>26</sup> <http://www.eas.ee/service/development-voucher/?lang=en>

Figure 14: Student placement innovation vouchers – example from Scotland

### **Scheme at a glance**

- The scheme is aimed at building on existing relationships between SMEs and HEIs to continue the development of a standard innovation voucher award.
- Only SMEs that have had a successful standard innovation voucher award are eligible to apply.
- The company contributes an equal value in cash or in kind (such as staff time, materials or equipment) or a combination of these.
- The voucher should be used to continue the development programme from the original innovation voucher project.
- The company should identify a clearly defined issue or opportunity that will benefit from PhD/Masters student interaction within their business to set timescales.
- The company must have suitable premises to host a student for the duration of the project.

### **Application stages**

1. Following completion of a standard innovation vouchers project, the SME and academic partner meet to discuss the student placement voucher opportunity.
2. The SME and academic partner fill out the application form and send it to Interface.
3. Interface reviews it and may ask for further information before sending to the Scottish Funding Council.
4. Scottish Funding Council assesses the application and communicates its decision.
5. The collaborative project between academic partner and business begins and a final report is produced on completion of the close-out meeting.
6. On receipt of the final report to Interface, the Scottish Funding Council makes the payment to the academic partner.

### 3.1.3 Key operational steps and timeline

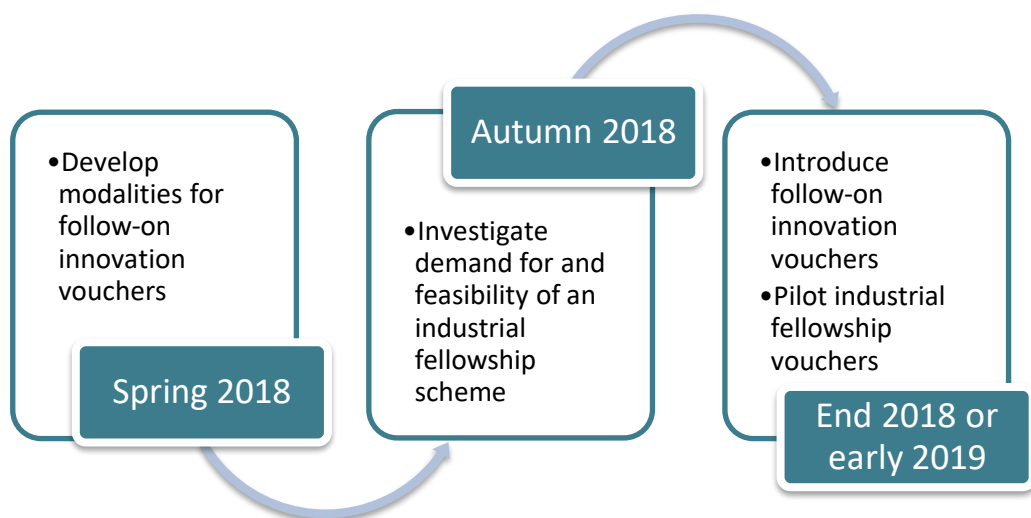
The development and implementation of follow-on innovation vouchers (and possible industrial fellowship vouchers) should be the responsibility of MITA, which is responsible for the current innovation voucher scheme. In future, the government could consider shifting responsibility for implementation of the innovation voucher scheme(s) to the national interface organisation (see fourth recommendation in this section).

From early 2018, modalities for follow-on innovation vouchers should be developed, and a budget for an initial round of implementation secured.

From mid-2018, MITA can investigate the demand for and feasibility of introducing an industrial fellowship scheme – leveraging inspiration from the student placement innovation vouchers (in Scotland) and similar mobility schemes in other countries.

By the end of 2018 (or early 2019), an initial round of follow-on innovation vouchers should be introduced. In addition, (depending on the study results), an industrial fellowship voucher pilot could be implemented.

Figure 15: Timeline - implementation of follow-on innovation vouchers



## **3.2 A performance – and partnership-based funding model for applied research centres**

### **3.2.1 Analysis and rationale**

As noted in the background report, research-industry cooperation is high on the political agenda and is subject to numerous measures and regulations. During 2007-2013, the main emphasis was on capital (equipment and buildings) investment in research infrastructure, STPs, etc. Despite the policy attention and past investment, Lithuania continues to lag well behind in indicators related to collaboration. The Lithuanian National Audit Office (NAO) published a critical report in April 2017 on the failure to ensure that all planned results were achieved from these major investments. The NAO noted in particular that “the fact that cooperation between science and business is not growing is evident from the ratio of funds received from economic entities (businesses) for the implementation of R&D related orders on the one hand, and the state budget funding for the development of R&D, on the other...during 2012-14, the ratio decreased”<sup>27</sup>.

As argued in the background report, the official statistics on the share of higher education and government R&D financed by business do not match with other evidence. Indeed, contract research revenue declined in 2014, possibly underlining the role of the ESIF (as this year coincided with the end of the previous programming period). Contract research is also heavily concentrated, with three universities accounting for two-thirds of the activity during 2012-2014. Most of the OACs created from 2013 onwards registered less than EUR 1 million in revenue from businesses during the period 2012-2014. Income from both Lithuanian and foreign enterprises increased in 2015 but still only totalled about EUR 6.5 million. The trend data makes it unlikely that the OACs will be able to reinvest using their own resources to replace or update equipment by 2020.

The barriers and drivers for cooperation have been examined in several studies and surveys and do not differ significantly from those reported in other countries with key factors that could promote greater cooperation. These include sourcing interesting applied research problems and reviewing criteria for researcher careers to take account of industrial or societal impact.

There is a general consensus that the current contract research and technology transfer capacities and processes in the public and university sectors are not optimal. The round-table session with technology transfer and OAC staff from the universities highlighted a need for a range of approaches depending on the

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<sup>27</sup> See: <https://www.vkontrole.lt/failas.aspx?id=3705>



type of partner firm and the sector. However, compared to the full range of possible options (see **Figure 16**), the current range of methods used appears to focus on three cooperation modes:

- First, patenting and licensing agreements, essentially with larger and/or international companies, where the role of a TTO is to negotiate technology licensing or sales agreement.
- Secondly, a proactive outreach based on the expertise/services/infrastructure of the HEI/PRO, by inviting selected local firms to visit the facilities or participate in international events. Through the OAC system, lists of services and equipment have been drawn up and are being promoted towards companies. However, the expert team concurs with the view that the MITA OAC website is not an effective means of fostering business engagement.
- Thirdly, personal relations – both formal and informal – are a key conduit for cooperation. This can include exhibitions and fairs, alumni network, or encouraging researchers and professors to get involved in smaller-scale advice or testing support (using innovation vouchers) to draw companies towards more substantial cooperation.

Figure 16: Organisational forms of university-industry cooperation

Type of cooperation	Specific form of cooperation
Personal informal relationships	<ul style="list-style-type: none"> <li>– Academic spin-offs</li> <li>– Individual consultancy (paid or free)</li> <li>– Information exchange forums</li> <li>– Collegial interchange, conferences, and publications</li> <li>– Joint or individual lectures</li> <li>– Personal contact with university academic staff or industrial staff</li> <li>– Co-locational arrangement</li> </ul>
Personal formal relationships	<ul style="list-style-type: none"> <li>– Student internships and sandwich courses</li> <li>– Students’ involvement in industrial projects</li> <li>– Scholarships, studentships, fellowships and postgraduate linkages</li> <li>– Joint supervision of PhDs and Masters theses</li> <li>– Exchange programmes (e.g. secondment)</li> <li>– Sabbaticals periods for professors</li> <li>– Hiring graduate students</li> <li>– Employment of relevant scientists by industry</li> <li>– Use of university or industrial facility (e.g. lab, database, etc.)</li> </ul>

Type of cooperation	Specific form of cooperation
Third party	<ul style="list-style-type: none"> <li>– Institutional consultancy (university companies including faculty consulting)</li> <li>– Liaison offices (in universities or industry)</li> <li>– General Assistance Units (including technology transfer organisations)</li> <li>– Government agencies (including regional technology transfer networks)</li> <li>– Industrial associations (functioning as brokers)</li> <li>– Technological brokerage companies</li> </ul>
Formal targeted agreements	<ul style="list-style-type: none"> <li>– Contract research (including technical services contract)</li> <li>– Patenting and licensing agreements (licensing intellectual property rights (IPR))</li> <li>– Cooperative research projects</li> <li>– Equity holding in companies by universities or faculty members</li> <li>– Exchange of research materials or joint curriculum development</li> <li>– Joint research programmes (including joint venture research project with a university as a research partner or with a university as a subcontractor)</li> <li>– Training programmes for employees</li> </ul>
Formal non-targeted agreements	<ul style="list-style-type: none"> <li>– Broad agreements for university-industry collaborations</li> <li>– Endowed chairs and advisory boards</li> <li>– Funding of university posts</li> <li>– Industrially sponsored R&amp;D in university departments</li> <li>– Research grant, gifts, endowment, trusts donations (financial or equipment), general or directed to specific departments or academics</li> </ul>
Focused structures	<ul style="list-style-type: none"> <li>– Association contracts</li> <li>– Innovation/incubation centres</li> <li>– Research, science and technology parks</li> <li>– University-industry consortia</li> <li>– University-industry research cooperative research centres</li> <li>– Subsidiary ownerships</li> <li>– Mergers</li> </ul>

Source: Ankrah S., AL-Tabbaa, O. (2015), *Universities-industry collaboration: A systematic review*, *Scandinavian Journal of Management* (2015) 31, 387-408:  
<http://dx.doi.org/10.1016/j.scaman.2015.02.003>

It was suggested that there is a growing practice within the TTO network of referring companies to other universities that are more specialised in the field of interest to a business, as well as cases of repeat contacts with companies, e.g. in life sciences (gene engineering). However, the limited number of staff in the TTO and the lack of expertise on specific issues, such as IPR or industry sectors, limits the potential effectiveness. The panel emphasises that technology transfer needs to be viewed as a strategic function in all universities, rather than something they feel obliged to do to align with public policy. There is need to invest in the TTO staff and give them a longer-term horizon to keep them motivated. For instance, gaps in funding between the MITAP project that supported OAC commercialisation managers and the follow-up project created significant problems.

Internationally, TTOs aim to market technologies rather than research infrastructure services or equipment. However, there are not many fields in which Lithuania can offer something unique at the global level. It was felt that there was a need to improve international marketing, especially integration into top innovation ecosystems in the EU. There is a need to experiment with other forms of cooperation, such as companies' co-location and investment on campuses and in the OAC facilities. This model encourages companies to use shared facilities and equipment and a responsive evolution of the facilities, e.g. the purchase of equipment for additive manufacturing or biotech developments.

An additional cooperation route is that of spin-offs, with the larger universities reporting over 50 spin-offs in the last five years, but only a handful by others. The access to public equity/risk capital is viewed as critical for university spin-offs, with the Ministry of Economy suggesting universities should take stakes/shares in their spin-offs with a view to better 'embedding' them in the Lithuanian innovation ecosystem (avoiding rapid trade sales or relocation internationally).

A key issue is that the HEI/PRO system lacks the capacities to work up to prototype development level, whereas businesses are not willing to invest in 'knowledge' and require the perspective of a commercial return. A few specialised spin-offs or start-ups and a small number of larger firms are able to work on technology development in partnership with the HEI/PRO sector, although in most cases such cooperation does not work well. Despite a number of national programmes focused on areas with high potential, there are only a limited number of firms working in each field, which means scale or critical mass is an issue.

### 3.2.2 Detailed recommendation

We recommend that the Lithuanian government commissions a **strategic assessment of the options for a performance-based funding system for the network of applied research centres**<sup>28</sup>. This should cover staffing and equipment in order to assess industrial relevance (e.g. potential to be involved in prototyping or testing of business products, services and processes), examine the basis for the reintroduction of the obligation to report on key performance indicators (KPIs) related to business usage of equipment, and propose a revised financing model that rewards those public and higher education institutes (HEIs) that secure third-party (non-state budget) funds. The assessment should examine the options for introducing performance-based funding drawing on international examples that could include, for example, the French Carnot Institutes, the UK Catapult Institutes or similar models that expect such centres to source a significant share of their funding from industrial partnerships.

Figure 17: Examples of funding models for applied R&D centres

Country	Funding model for applied R&D and technology transfer centres
France – Carnot Institutes	Founded in 2006, the Carnot label is designed to develop partnership-based research between public research laboratories and business. It arose out of the ‘Pact for Research’ and sought to reinforce the activities of existing public research institutes already involved in research partnership with enterprises. Currently, 34 institutes have been awarded the Carnot designation (a ‘seal of excellence’ for industrially relevant research) accounting for about 15 % of French research personnel. The institutes, which are located across France, are grouped in seven main fields and cooperate closely with the French ‘competitiveness clusters’. They receive core funding from the National Agency for Research (ANR) and over half their funding is derived from government sources (either core funding or research contract revenue). However, roughly half of the institutes’ research is financed by companies <sup>29</sup> , and the ANR provides core funding to Carnot Institutes based on an incentive formula that takes into account revenues from contract research, income from licensing IP, etc.
Germany – Fraunhofer-	A not-for-profit association of 60 research institutes performing contract research for public and particularly business clients. Each

<sup>28</sup> These would include OACs, competence centres, technology transfer centres and other business-relevant research infrastructure and equipment (e.g. at STPs, state research institutes, etc.). See Annex 4 of the background report for a list of OACs.

<sup>29</sup> See: <http://www.instituts-carnot.eu/en/key-figures>

Country	Funding model for applied R&D and technology transfer centres
Gesellschaft	institute is paired with a German university and can use students as part-time researchers, giving them practice experience in commercially orientated research and manufacturing environments. The institutes generate technology for commercial products and processes, and enable companies to test equipment, etc. A key impact is the flow of trained engineers and technicians to the private sector. Fraunhofer derives roughly one-third of funding from 'core funds', one-third from research contracts with government agencies and other public organisations, and one-third from contract research for private companies. Core funds are allocated to institutes based on their success in contracting research revenue. This model has the drawback of being unlikely to foster transformational research in thematic areas where few companies exist.
UK – Catapult Centres	The Catapult Centres (or Technology and Innovation Centres) were established based on existing industrial research capacities within UK universities and on industrial demand for contract R&D services. Catapults are not-for-profit, independent centres which connect businesses with the UK's research and academic communities. Each Catapult centre specialises in a different area of technology, but all offer a space with the facilities and expertise to enable businesses and researchers to collaboratively solve key problems and develop new products and services on a commercial scale. The funding model varies through the life of the technology and innovation centre, and can be expressed in simplified terms as following the one-third, one-third, one-third model. Under this model, centres are required (when fully established) to generate their funding broadly equally from three sources: business-funded R&D contracts, won competitively; collaborative applied R&D projects, funded jointly by the public and private sectors, also won competitively; and core public funding for long-term investment in infrastructure, expertise and skills development.

*Source: Authors based on website material and Wessner (2013)<sup>30</sup>*

Other possible models to consider include the Nordic countries industrial research centre networks such as VTT (Finland)<sup>31</sup> or SINTEF (Norway)<sup>32</sup>. We do not advocate a specific model of governance or funding, but rather consider that the proposed review should develop a suitable 'hybrid' that takes account

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<sup>30</sup> Wessner, C. (2013), 21<sup>st</sup> Century Manufacturing. The role of the Manufacturing Extension Partnership Program. National Academy of Sciences, Washington.

<sup>31</sup> See: <http://www.vttresearch.com/>

<sup>32</sup> See: <https://www.sintef.no/en/this-is-sintef/>

of Lithuania's specific situation, given the business demand and absorptive capacities and research system capabilities to carry out industrially relevant research. The aim should be to foster a medium-term (post-2020) shift towards a partnership-based approach to stimulating industrially relevant R&D and increasing the share of revenue towards at least one-third from private companies for all designated 'applied R&D centres'. More generally, evidence on performance-based research funding models that could be applied to the overall higher education and public research system could also be drawn from the ongoing PSF MLE on this topic<sup>33</sup>.

In parallel, a linked recommendation concerns a need to further strengthen and professionalise the universities' contract research and industrial liaison management teams to support a more strategic and focused approach to securing additional third-party revenue (whether from business, charitable or European programmes). The aim should be to phase in during the current programming period, and fully implement for the following period, a funding model that better rewards those 'units' within the research systems that generate the most revenue from third-party sources. This shift should be accompanied by the application of two key principles in the research funding and RI investment plans:

- Giving priority to those R&D projects that involve industry-research cooperation with industry co-funding, thereby reducing the intensity of public funding below 100 %;
- Investment in the development of RIs should be limited to cases where it is clearly shown that such improvements would be beneficial for the business sector.

In parallel to the review of industrially relevant public and higher education research infrastructures and centres, there is also a need to **further reinforce and 'federate' the network of university TTOs and industrial liaison staff**. As noted in the introduction of this section, the focus needs to shift from 'technology transfer' as a binary form of cooperation (a university licensing technology, etc.) towards the creation of collaborative innovation platforms co-located around research infrastructures and innovation centres. Equally, as underlined in the state audit report, there is a need for S&T parks to go beyond 'renting space' to playing a more active role as 'agents of change' or 'boundary spanners' and can help in the process of both 'national linkages' and international openness. At a minimum, there is a need to review the support and training provided for TTO staff:

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<sup>33</sup> See: <https://rio.jrc.ec.europa.eu/en/policy-support-facility/mle-performance-based-funding-systems>

- Further develop the existing network of TTOs (with regular meetings three to four times annually) for the purpose of sharing experience, discussing/agreeing common work practices or tools (e.g. handling IP), sharing specialist resources (e.g. legal assistance), adopting common KPIs, etc.
- Initiate a programme of capacity building for TTO employees (with many elements of training also relevant for cluster managers and other boundary-spanning individuals), e.g. as part of the Inogeb LT-3<sup>34</sup> instrument.
- Ensure that TTOs collate and feed in information on the companies they engage with to developing the Business Lithuania agency's account management system.

### **3.2.3 Key operational steps and timeline**

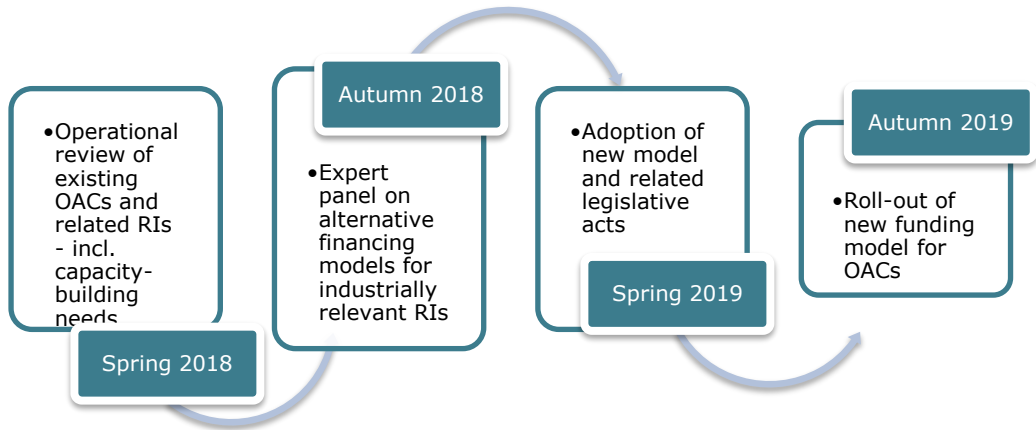
We propose a four-step approach to implementation of the new funding model, as summarised in the diagram below.

In a first phase, we suggest, in line with the recommendations by the NAO and the OECD, that the current capacity for effective delivery of business-relevant R&D and related services by the OACs (and all other industrially relevant research and testing centres supported by the state budget) should be subjected to a thorough review. This could be undertaken either as a study commissioned from a team of experts (preferably including international experts in industrial R&D) and/or involve a panel of leading business specialists from priority sectors. The output of this review should include not only a technical assessment of the relevance of the installed equipment for business needs, but also a review of staffing (principal researchers, laboratory staff, etc.) levels and capabilities and related industrial liaison and technology transfer capacities.

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<sup>34</sup> <https://rio.jrc.ec.europa.eu/en/library/inogeb-lt-3>

Figure 18: Timeline – new funding and partnership model for OACs



In a second step, an expert panel should examine and report on possible models for alternative financing and the feasibility of improving the ratio of funding from third-party (business, etc.) versus state budget resources across the network of applied research institutes. The panel should propose a timetable and related legislative or regulatory changes required for the introduction of a new system and indicate which organisations should be covered by this funding model.

We foresee that it would require a period for the parliamentary and governmental approval of the new financial model (step 3) before a roll-out of the new funding arrangement in late 2019. The new funding system should include a limited set of key metrics that all organisations should be required to report on annually to the government.

As noted above, in parallel to the reform of the funding model, there is a need to improve the skills and capacities of the associated industrial liaison and technology transfer staff attached to OACs. It is also necessary to ensure they become part of the overall business innovation support network working in partnership with Interface Lithuania experts, account managers from the new Business Lithuania agency and other intermediaries.



### **3.3 Stronger, more internationally visible and professional cluster initiatives**

#### **3.3.1 Analysis and rationale**

As described in the introduction to this chapter, collaborative support policies (e.g. cluster programmes, strategic innovation partnerships, innovation networks, etc.) have become a common feature in regional and national innovation policies in Europe and around the globe<sup>35</sup>. Clusters, or rather cluster initiatives (involving cluster firms, government and/or the research community), conduct organised efforts to increase the growth and competitiveness of a cluster within a region. Cluster initiatives are increasingly managed by specialised institutions, known as cluster organisations, which take various forms, ranging from non-profit associations, through public agencies to companies<sup>36</sup>. A cluster organisation does not necessarily have members, but it provides services to the cluster initiative participants. Services include, e.g. improving innovation capability, exploring business opportunities, fostering entrepreneurship, education and training, internationalisation, etc.

In 2011, the European Cluster Excellence Initiative established a set of indicators (and minimum requirements) for assessing the excellence of cluster management organisations<sup>37</sup>. These include guidance on the structure of the cluster (including size/critical mass and composition of cluster participants, level of commitment, and geographical proximity). Evaluations of cluster programmes<sup>38</sup> have evidenced the importance of skilled management and facilitation of cluster initiatives, the quality of support services offered to cluster initiative members, and the ability to facilitate a critical mass of actors towards joint strategic action. Evaluations highlight that strategic collaboration leads to the ability to leverage and access additional funding, strengthen the depth of research-industry collaboration, and attract additional (higher-value-added) talent and investments. In addition, impact evaluations of cluster programmes<sup>39</sup> have shown that firms engaged in cluster initiatives experience stronger revenue, employment and productivity growth and a greater capacity for collaborative R&I than comparable firms 'outside' cluster initiatives.

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<sup>35</sup> See, for example: European Commission (2016) *Smart Guide to Cluster Policy*; OECD (2010) *Cluster Policies*; OECD (2007) *Competitive Regional Clusters-National Policy Approaches*

<sup>36</sup> EC Communication: Towards world-class clusters in the European Union: Implementing the broad-based innovation strategy- SEC(2008) 2637} 17 October 2008, p.8

<sup>37</sup> [https://cluster-analysis.org/downloads/20111128\\_European\\_Cluster\\_Excellence\\_BASELINE\\_web.pdf](https://cluster-analysis.org/downloads/20111128_European_Cluster_Excellence_BASELINE_web.pdf)

<sup>38</sup> See, for example: NESTA (2012) *The Effects of Cluster Policy on Innovation*

<sup>39</sup> See, for example: Statistics Norway (2015) *Effect on firm performance of support from Innovation Norway*; DASTI (2011) *The impact of cluster policy in Denmark*

Currently, there are over 50 clusters in Lithuania which aim to foster networking and develop cooperation within their respective ecosystems; facilitating companies' (and other actors) engagement in research, development and innovation activities; and promoting clusters' integration into international networks. Innovative cluster development comprises a set of measures: Inocluster LT and LT+ and Inogeb LT-3. The Inocluster set of measures started in 2010 with the aim of supporting cluster infrastructure development activities to promote open innovation and ensure knowledge and technology transfer. In the context of these support programmes, clusters are defined as the agglomeration of at least five private legal entities, connected in the value chain and sharing common economic interests. There are no requirements for a longer-term vision and direction for the collaborative action. Public funding supports investment into the cluster's training and research infrastructure, the cluster's joint (open source) R&D infrastructure (laboratories, testing labs), and marketing of the cluster to attract new members (Paliokaite, 2014a).

Clusters in Lithuania are relatively small, with an average of 12-15 members (including companies and industrial associations, and universities). Most company members are micro and small enterprises. Clusters operate as independent legal entities (private companies or associations), led by a cluster management/secretariat working proactively to develop cooperation between members, understand R&I needs, and engage members in R&I projects and international cooperation. Clusters are funded through the ESIF/Inocluster programme (around 30 %), member contributions (around 40 %), and other financial instruments. In addition to funding, advisory support and promotional activities are provided through MITA and Lithuanian Innovation Centre (LIC) consultants and the Klaster.LT homepage.

In Lithuania, the large volume of clusters with low critical mass poses a number of challenges:

- Low reach and efficiency
  - Cluster managers focus their efforts on a very limited group of (member) companies and have weak incentives to expand their membership base.
  - Funding is short term and project oriented – requiring a large amount of time to be spent on securing new funding (vs. developing longer-term, more strategic activities or improving service offerings to companies).
- Low impact potential
  - With low requirements on participation (members) and involvement of primarily micro and small enterprises, the potential impact (in terms of increased innovation, sales, productivity, exports, etc.) is limited.

- Without a critical mass of companies, specialised knowledge and infrastructure, it is difficult to foster new interactions and transfer knowledge – leading to innovation.
- Low international visibility and attractiveness
  - A small group of companies without a clear strategic profile has more difficulties in standing out among others, thereby limiting possibilities for international collaboration. (Of the 52 clusters in Lithuania, only 16 are profiled on the European Cluster Collaboration Platform – as of 7 September 2017 <sup>40</sup>, and only one cluster has received a cluster management excellence label<sup>41</sup>).
  - Without critical mass and evidence that the collaborative environment fosters interaction and development, it is more difficult to attract new talent and investment – using cluster initiatives to complement efforts to attract innovation-oriented FDI.

To address these challenges, it is recommended that stricter criteria be applied in the cluster programme (reducing the total number of clusters and ensuring operational partnerships with existing STPs, TTOs and OACs), and that cluster organisations’ services to firms be further professionalised.

The ongoing evaluation of Lithuania’s cluster measures (to be published end-September) will provide a more detailed analysis of the current state of the cluster landscape in Lithuania and how cluster initiatives have contributed to realising stated policy objectives. The evaluation will also provide further detailed recommendations (see 3.3.2) that should be taken into account when planning operational steps (see 3.3.3).

### 3.3.2 Detailed recommendation

In order to develop stronger and more internationally visible cluster initiatives (reducing the total number of clusters and ensuring operational linkages with existing STPs and OACs), the expert team recommends **applying stricter criteria in the cluster programme**. These criteria should encompass, for example:

- The importance and potential of the domain (e.g. sector, thematic area);

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<sup>40</sup> <https://www.clustercollaboration.eu/cluster-list>

<sup>41</sup> As of 7 September 2017, one Lithuanian cluster (iVita wellness cluster) has received the bronze label (which expired 03/09/2016); none have received the silver or gold quality assessment labels. See: <https://www.cluster-analysis.org/benchmarked-clusters>

- Critical mass and engagement of companies (different sizes), knowledge institutions, TTOs/OACs/STPs and other support infrastructure;
- Relevance and coherence of (long-term) strategy and action plan for the cluster initiative;
- Quality of management and services provided by the cluster initiative.

Figure 19 : International examples – selection criteria

Several regional and national cluster programmes exist which can serve as a source of inspiration. Some examples include:

- Basque Country, Spain
  - Scope and critical mass of members within the region (presence of leading companies, SMEs and STI system at different links in the value chain; minimum cluster size in terms of total turnover/% of regional GDP, employment and export)
  - Relevance and alignment of cluster initiative with government strategies
  - Strategic plan addressing common challenges that can be addressed through cooperation
  - Active (i.e. services provided) in the strategic areas of internationalisation, technological innovation, business innovation and talent development.
- Flanders, Belgium
  - Strategic domain for Flanders (economic base and technological competence in Flanders, economic potential, scientific competence in Flanders)
  - Cluster potential (extent and potential of competitiveness increase, timeline of increase, relevance and complementarity with existing efforts, representativeness and support/commitment by stakeholders)
  - Quality of the project (plan of action, organisation and functioning of the cluster management).
- Norway
  - Cluster resources and relations (critical mass of companies, knowledge institutions and support infrastructure in the region, existing linkages between them)
  - Cluster position and potential (current position in an area relevant to the economy, potential for renewal/growth)
  - Cluster project's goals, strategy and potential for effect
  - Ownership and leadership of the cluster project (stakeholder anchoring and engagement in the governance, capacity of cluster manager and team)
  - Action plan (clear strategy and goals, adequate human and financial resources for implementation, structure for communication and learning).

In advance of establishing stricter criteria, it is recommended that the **intervention/effect logic for the cluster programme be clarified**, establishing expectations for shorter-term outcomes/results and longer-term

effects, as well as the types of indicators that will be used to track progress over time.

In parallel to adjusting the criteria for the cluster programme, the **overall approach to funding and other support activities should be revised** – relating funding levels (and duration) more directly to fulfilling the adjusted criteria and applying “modular funding” packages. Financial investments should be targeted at those initiatives which can demonstrate critical mass and cohesive linkages, a clear strategic direction, and the management capacity to deliver professional services to firms (i.e. those cluster initiatives which meet the adjusted criteria). An accreditation process (similar to the process used in Hungary<sup>42</sup>) could be applied.

Initiation of “modular funding” packages targeting different types of activities (e.g. networking/collaborative development, skills development, RDI projects, international linkages<sup>43</sup>) – where different funding modules follow different state-aid rules (different duration of funding, etc. allowed for different activities) – could also be explored. The idea behind modular funding is to tailor the activities and services of the cluster initiative in those areas that provide most value to the companies (mainly SMEs), and relate the funding level to the ambition of the activity (and the cluster’s stage of collaborative development). The application of modular funding packages could provide accredited cluster initiatives<sup>44</sup> with more flexible, ‘fast-track’ funding to pursue collaborative opportunities that arise over the course of a funding period.

In addition, the expert team recommends **expanding support activities for cluster organisations beyond the funding programme** in order to develop the management and delivery capacity of cluster organisations’ services to firms. Financial incentives currently provided to cluster organisations are an important element. However, professional cluster management matters, but is only supported to a limited degree within the current funding scheme. Approaches like the European Cluster Excellence Initiative (ECEI) or the European Foundation for Quality Management (EFQM) can be appropriate both to strengthen the performance of the cluster organisation as well as to increase international visibility when receiving respective internationally recognised labels.

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[http://www.clusterpolisees3.eu/ClusterpoliSEEPortal/resources/cms/documents/Hungarian\\_cluster\\_accreditation\\_system\\_intro\\_2014.pdf](http://www.clusterpolisees3.eu/ClusterpoliSEEPortal/resources/cms/documents/Hungarian_cluster_accreditation_system_intro_2014.pdf)

43 The funding approaches used in the Norwegian Innovation Clusters programme and the Flemish Spearhead Cluster programme could provide inspiration.

44 i.e. those cluster initiatives with a strong critical mass, clear strategic vision and proven track record of delivering value from collaborative action.

An enlarged cluster support scheme could cover four new (or strengthened) elements:

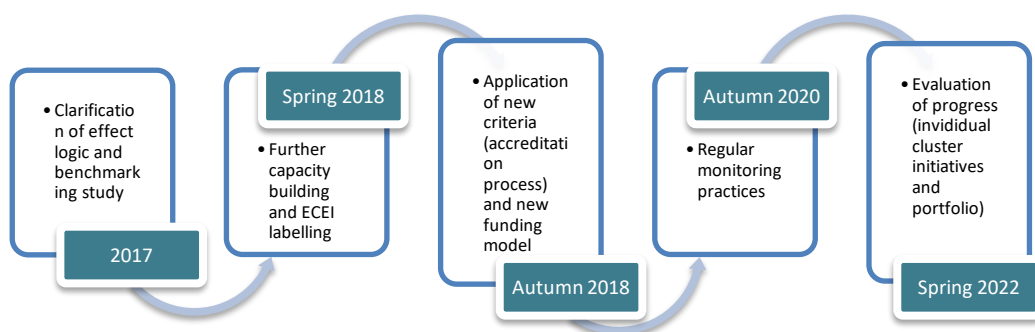
- Training and coaching towards professional cluster organisations and the development of new, tailor-made services;
- Structured information and experience exchange among the cluster organisations;
- Labelling of cluster organisation according to the ECEI<sup>45</sup> or EFQM<sup>46</sup> approach;
- Setting up a common platform (in English) to present (strongest, accredited) Lithuanian cluster initiatives internationally.

### 3.3.3 Key operational steps and timeline

The development and implementation of stricter criteria and a new approach to funding and other support activities for cluster organisations should be undertaken as a joint effort between the Ministry of Economy and the Ministry of Education. We recommend that a joint task force be set up during late 2017 – taking on the first steps of clarifying the cluster programme effect logic and conducting a benchmark of international practices for the selection and funding of cluster initiatives.

During spring 2018, a strengthened process should be initiated for training and coaching cluster organisations – focusing on discussion and anchoring adjusted criteria, and possibly initiating additional ECEI labelling activities among Lithuanian cluster organisations.

Figure 20: Timeline – consolidation of Lithuanian clusters



<sup>45</sup> [www.cluster-analysis.org](http://www.cluster-analysis.org)

<sup>46</sup> [www.efqm.eu](http://www.efqm.eu)

During autumn 2018, the new criteria and 'performance-based funding' approach should be phased in through a process of strategic dialogues and accreditation, as well as the initiation of regular monitoring practices.

Cluster initiatives should track and report their progress on a regular basis – using standard tools as well as leveraging regular exchange of experience to enhance learning between the cluster initiatives. A national summary of progress (relative to KPIs established in the clarified effect logic) should be made in autumn 2020 – providing insights on development dynamics and overall results that have been achieved in individual cluster initiatives, and guiding changes in cluster initiatives' strategic direction and services to companies.

In autumn 2022, an external evaluation of the cluster programme should be carried out – providing an overview of results and perceived benefits from the cluster companies, as well as testing the programme effect logic (realistic goals and timing of results and longer-term impacts).

### ***3.4 Proactive engagement with business: Interface Lithuania***

#### **3.4.1 Analysis and rationale**

A key bottleneck in the business-science cooperation relates to the internal capabilities and motivation of firms to engage in more substantial innovation and R&D projects (with or without research partners). The evidence (see the background report, section 1.2, Palokaite, 2017) suggests that the Lithuanian economic structure (specialisation in low-to-medium tech and labour-intensive business sectors) is not conducive to a relatively high level of business expenditure on R&D (Lithuania is ranked 23<sup>rd</sup> out of 28 EU Member States for BERD as a share of GDP). The main mode of 'knowledge acquisition' (70 % of innovation expenditure) is tangible (acquisition of machinery and equipment) investment, even if there has been a recent growth in the intensity of non-R&D innovation (improvements in design, brand creation or process optimisation). Overall, the Lithuanian business sector's ability to absorb and assimilate external information is limited (royalties and licence fee payments, as well as high-tech imports remain persistently at very low levels). Indeed, Lithuania is bottom of the league in the EU for the assimilation of external knowledge.

However, there is growing pressure on the standard business model (i.e. cheap labour and natural resources) of, what the background report calls, the 'current locomotives' in the economy. As one interviewee noted: "70 % of industry is still a legacy of the Soviet period, most of the companies have benefitted from low depreciation costs and low salaries. Now we are facing [a] turnaround situation due to a change of management allied to rising wages. Before there was little interest in innovation, now there is a shift towards increasing competitiveness based on new technologies or business models."

Most business cooperation with researchers tends to be on a bilateral basis and often with individual researchers (rather than through TTOs, OAC staff or cluster managers). The scale of services (technical testing, etc. rather than R&D) contracted by firms from HEIs or PROs is small and the value of contracts is usually less than €2000. A coordinated effort to help manufacturing firms and the energy and transport sectors to digitalise (Industry 4.0) is required.

Overall, the current policy instruments are not sufficiently incentivising for business to begin or intensify ongoing R&D and innovation activities. As described above, the current innovation voucher scheme is appreciated as a step towards developing a culture of (science-industry) collaboration, yet additional mechanisms are needed to build on the depth and duration of such initial collaboration efforts, and to proactively facilitate new strategic linkages.

### **3.4.2 Detailed recommendation**

The expert team recommends the implementation of a service contract for creating a national interface structure (staffed by industrially experienced staff) to ensure pro-active engagement with businesses to support them in translating their needs and to act as neutral brokers in securing support from the most appropriate partner institutions. The model proposed is inspired by Interface Scotland (see box below).

The mission of Interface is separate and distinct from that of university technology transfer offices or industrial liaison officers. The Interface will be tasked with a proactive business outreach function which will include a programmed series of visits to companies that request support in defining their needs for external support in developing an R&D or innovation project (broadly defined to cover product, process, service, marketing or organisational innovation).

The Interface Lithuania team should be staffed by industrially experienced personnel (with at least five years of business experience in one or more specific sectors), as well as knowledge and networks across Lithuanian universities and research institutions. As part of its service contract, Interface Lithuania should define an annual programme of outreach and engagement visits to companies that are 'potential innovators' (based on a set of criteria and in line with the segmentation strategy of the new business agency) in all Lithuanian regions, without a pre-defined sectoral or technological focus. Moreover, the Interface management should seek to work closely with main sectoral or cluster organisations to identify companies that are 'potential innovators' and seek to engage actively with them. This could lead to targeted 'campaigns' in specific sectors (e.g. agro-food, energy, etc.) to engage with companies not yet actively collaborating with university or public research institutes.



Figure 21: A potential model – Interface Scotland

Interface Scotland was established in 2005 as a central hub to connect businesses from a variety of national and international industries to Scotland's higher education and research institutes. Its core commission is to enable business-academic collaborations for economic and social benefit. Interface works closely with Scotland's eight Innovation Centres to ensure effective cross referrals and stimulate demand for collaborative academic projects. In recent years, Interface has become a success story and a reference for other countries because of its major impact on the economy and society. According to Interface's Annual Review 2015-2016, companies supported by Interface add an estimated £70 million to the Scottish economy each year through new services, processes or products, or efficiencies leading to cost savings.

The activities undertaken to support businesses and academics to collaborate are:

- **Business engagement:** Stimulating business demand for academic expertise and awareness of the benefits of collaborating with academia through events, PR, social media, e-marketing, website, case studies, etc. Facilitating mutually beneficial collaborations through direct contact with businesses and by stimulating referrals from intermediaries (Scottish Enterprise, Highlands and Islands Enterprise, Business Gateway advisors), across all Scottish regions via business engagement staff based locally. Key areas of activity include: translating the needs of business to propositions for HEIs to consider; brokerage to match capability and capacity in partner institutions; outcome management of collaborative projects and follow-up for sustained outcomes and maximising opportunities from other support mechanisms.
- **Innovation vouchers:** The innovation voucher programmes are aimed at building relationships between SMEs and HEIs in Scotland. The collaborative projects must lead to new products, services or processes that will benefit the company, the academic institution and the Scottish economy. Standard innovation vouchers: This type offers HEIs up to £5000 to meet up to 50 % of the costs of new collaborations with Scottish SMEs whose contributions can be matched either in kind or in cash. The awards are specifically to encourage new partnerships that have not jointly received funding previously from any source for the proposed project to build links between Scotland's HEIs and small businesses.
- **Follow-on innovation vouchers:** This programme was launched in January 2012 by the Scottish Funding Council in conjunction with Scottish Enterprise and Highlands and Islands Enterprise. It offers HEIs up to £20 000 and should encourage a longer, sustained relationship between companies and HEIs with the SME contributing 50 % of the total project costs in cash.

The 2013 Evaluation and economic impact study of Interface by BiGGAR Economics estimated that Interface currently generates £17 million gross value added (GVA) per year for the Scottish economy and supports more than 350 jobs. This was forecasted to increase to just under £80 million GVA per year and 2400 jobs by 2016. The evaluation also found that Interface is fulfilling an important gap in Scotland's current knowledge-exchange landscape by helping to make engagement between SMEs and academia more cost effective and efficient.

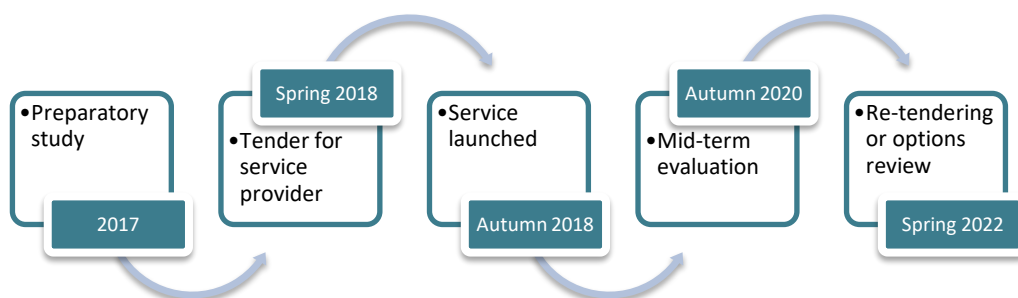
The Follow On Innovation Voucher Scheme has proven to have large direct impacts on companies: 45 % of companies receiving funding in 2016 reported an increase in turnover, while 89 % of all beneficiaries reported continued partnership with the universities or research institutions with which they have worked together on large-scale projects. Moreover, Interface-supported research has proven to be inclusive and to provide larger returns beyond economic ones. The innovation voucher scheme has underpinned key themes of environmental sustainability, equality and social inclusion.

Source: <http://www.interface-online.org.uk>

### 3.4.3 Key operational steps and timeline

The development and implementation of an interface service would be delivered via a service contract tendered out to ensure that a consortium of experts with the correct mix of industrial and research and innovation management know-how is commissioned. The two-year contract should be renewable once (for a further two-year period) with a mid-term evaluation commissioned to review processes and results and estimate the initial return in terms of GVA and employment generated from the projects supported. The Ministry of Economy's 'Technology Scouts' (funded by Inogeb LT) could provide a foundation for developing Interface Lithuania.

Figure 22: Timeline for development of Interface Lithuania



We recommend that the design of the service contract is based on a preliminary feasibility study that should be undertaken during autumn 2017 with a view to scoping out the target sectors and/or types of companies that would form the initial remit of the selected Interface team. The feasibility study should result in a set of specifications for inclusion in the tender for services (including a profile of the expertise required, target companies/sectors/clusters, estimation of KPI targets, etc.).

The Interface structure should retain due operational independence but should meet periodically with a steering group (selected ministries – economy, education and science, etc. – Business Lithuania, cluster managers, university TTO heads, etc.). It should produce an annual report detailing the services provided per target group as defined in the service contract or revised, in agreement, with the steering committee based on annual results.

## 4 INNOVATION-ORIENTED FDI

Lithuania has had some success in attracting FDI in business services (shared services, contact centres), software development/IT services and, to a lesser extent, in manufacturing. However, in terms of attracting R&D and, more broadly, innovation-oriented FDI, it is still early days. There have been some high-profile wins in software design, development and testing (e.g. Uber) but, in terms of pure R&D centres, Lithuania faces a tougher challenge. Although there are good examples of foreign affiliates having core R&D facilities in life sciences and lasers, almost all of these (and all the really significant ones) are the result of M&A.

At present, Invest Lithuania (InvestLT) is only mandated to attract greenfield (organic growth) FDI. In the context of innovation-oriented FDI, there are other modes of investment, and precursors to investment (R&D contracts, innovation pilots, venture capital investments in start-ups) which need to be considered and serviced to increase Lithuania's attractiveness as an 'innovation-location' and to secure long-term, higher-value investment.

InvestLT's FDI strategy places greater emphasis on attracting new investors rather than aftercare, that is retention and growth of existing foreign companies. Aftercare is also commonly referred to as investor development in many countries. There is clear evidence from successful countries (notably Ireland, Northern Ireland and Scotland) showing the critical importance of aftercare in securing longer-term, sustainable investment that enables locations to 'move up the value chain'. We firmly believe that this is much needed to ensure Lithuania's success in attracting FDI, in particular innovation-oriented FDI. This has significant implications for FDI attraction resourcing, both in Lithuania and overseas.

However, two fundamental issues are influencing the growth of innovation-oriented FDI in Lithuania, especially core R&D functions:

- The current quality of business-science cooperation in the country: Whilst evidence clearly shows that foreign investors are much more likely to invest in higher-value-added functions than local companies, both foreign and indigenous companies face similar challenges in accessing the potential opportunities from Lithuanian science.
- Brain drain and engagement with the Lithuanian diaspora: The global talent supply of highly skilled people (software developers, life scientists, laser experts, engineers, etc.) does not meet current global demand. European and global companies are competing for this resource and talented Lithuanians can find work around the world very easily. R&D laboratories and software development studios all need these skills. If Lithuania cannot supply

these skills, its attractiveness for innovation-oriented FDI will be seriously compromised.

As discussed above, Lithuania is challenged by a fragmented landscape of collaborative platforms for R&I. Although there are some cases where groups of research and industry actors work together to implement longer-term action plans (e.g. the Centre for Life Sciences and the Laser and Engineering Technologies Cluster), many university TTOs and OACs, STPs and clusters lack critical mass and operate in isolation. In addition, most collaborative platforms lack the 'soft infrastructure' (boundary-spanning individuals and other services) needed to proactively communicate and reach out to potential foreign partners and investors.

Broadly speaking, we consider the challenges are very similar for both Lithuanian and foreign companies, although significantly harder for the latter. Well-functioning and credible R&I platforms can serve as a means for boosting international visibility and attracting investment and talent. Clear long-term strategies for collective action can help highlight areas of particular strength, where pools of specialised labour, research capabilities, and infrastructure provide a stimulating and attractive environment for companies and research actors working in the field. Joint strategies can also highlight areas where capabilities or productive capacity are lacking, where talent attraction or international collaboration is most relevant.

In terms of 'place-based' dynamics, only five cities have a realistic chance of being suitable for R&I-type FDI as most others either do not have universities or have those with little to offer. The presence of local universities matters a great deal as they provide a pipeline of well-educated future workforce.

A related issue is that international flight connectivity is not at the same level as competitor countries. This can be a more significant issue for R&I centres because of the multinational nature of the teams and their research projects in their wider company context. International flight connectivity to Lithuania, in our opinion, is adequate but there is much room for improvement. Any measures that can increase the number, choice of carrier and frequency of services to key European business locations would be welcomed by foreign investors and international-oriented Lithuanian businesses.

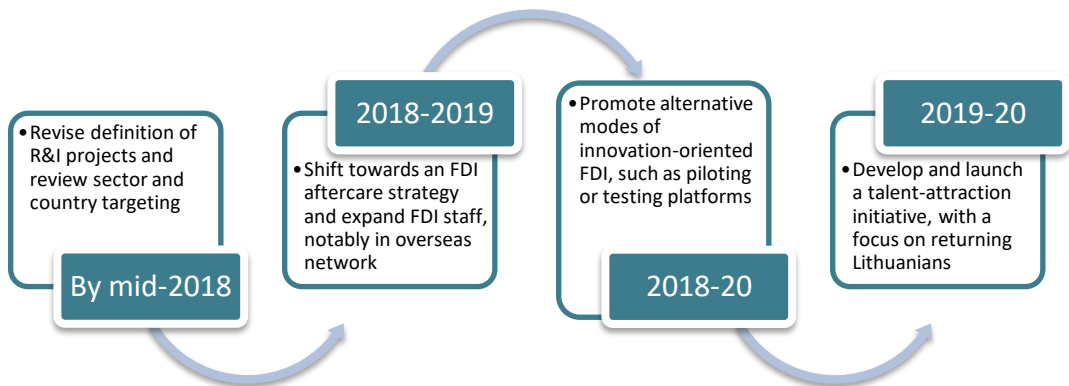
Six recommendations are outlined under the theme of innovation-oriented FDI. The recommendations are interlinked and can be seen as steps towards a revised and updated approach to optimising the value obtained by Lithuania from attracting and retaining more innovative foreign investors.

Figure 23: Main recommendations – innovative FDI

Recommendations	Timescale
1. Revise classification of innovation-oriented FDI and related KPIs	2018
2. Review sector and country targeting to improve coverage of most likely sources of innovative FDI	2018
3. Shift towards an FDI aftercare strategy based on key account management	2018-2019
4. Reinforce the staffing available to attract FDI, notably in the overseas network	2018-2020
5. Encourage alternative modes of innovation-oriented FDI projects and activities that are precursors to FDI	2018-2020
6. Develop a talent-attraction initiative to reinforce Lithuania’s image as a place where innovators live and work	2019-2021

The key steps in implementation of these recommendations are summarised in Figure 24.

Figure 24: Key operational steps and timeline – innovative FDI



## 4.1 *Revise classification of innovation-oriented FDI and related KPIs*

### 4.1.1 Analysis and rationale

Between 2012 and 2016, evidence from both InvestLT and private FDI databases confirms that Lithuania has been successful in attracting greenfield R&D FDI projects or those that have a significant innovation function, in particular for software development/design/testing services. , Lithuania has

been much more successful than both the other Baltic States in attracting such projects (Financial Times fDi markets data). However, it lags both the Czech Republic and, in particular, Poland, which have secured almost twice as many projects.

Between 2012 and 2016, 94% of the greenfield R&D/innovation type FDI projects in CEE countries were of the “design, development and testing” type. Only 17 “pure R&D centre” type FDI projects were recorded over the four-years across the CEE and this dropped to only three projects announced in 2016. In contrast there has been a general increase of “design, development and testing” projects – there were 50% more projects in 2016 than in 2013.

Figure 25 R&I greenfield FDI classifications

### Research and Innovation (R&I) greenfield FDI – scope of definitions

R&I greenfield investments classifications by *Financial Times* fDi markets database

- Research and development centres: core function of the investment is ‘pure’ R&D: “research activities drive product and process innovations”
- Design, development and testing: “design and development activities drive commercialisation, market expansion and ultimately the returns to research investments”

InvestLT present classifications:

- Projects whose functions are purely R&D
- Projects whose core function, for example manufacturing, which have an additional R&D or other innovation function

Source: Authors, Invest Lithuania, *Financial Times fDi Markets*, Belderbos, Sleuwaegen, Somers and De Backer (2016) from *OECD STI Policy Note December 2016*

InvestLT’s current strategy is for the period 2015-2020. One of the main targets (KPIs) is that 20 % of FDI projects should be “pure R&D” centres. However, this has been revised because it was (rightly based on market observation) unrealistic and replaced with a target that 40 % of projects should have some sort of R&I function (meaning it could be a manufacturing plant with some sort of laboratory). In addition, Invest Lithuania targets (overall – not specifically for R&D) 60 % of investments from new investors to Lithuania and 40 % from existing foreign investors (i.e. aftercare). In our opinion, that is an unrealistic target in the case of R&D-type investments. Moreover, as we explain above, currently, no systematic effort is being made to attract other types of FDI (e.g. selling Lithuania as a location for piloting and testing projects, etc.).

Whilst we believe the revised target is more realistic for Invest Lithuania, 40 % is still a very high goal and one which would be almost impossible to benchmark against other countries. Existing market databases do not record projects this way and therefore must have a tighter classification of R&D or design or development and testing (the terms used by *Financial Times* fDi markets).

Hence, a key challenge is to have a clear distinction and classification as to what pure R&D is versus a “project with an R&D function”. InvestLT’s existing definitions seem logical from our perspective. However, it is important that the investor provides tangible evidence of the project’s true nature – which can usually be ascertained from the job profiles.

A second challenge is how to benchmark performance against competitor countries. Unfortunately, all the existing comparative databases of FDI projects are privately owned and all have differences in their data-collection methodologies and classification of R&D projects. At the time of writing, only two of the databases (Bureau van Dijk and *Financial Times* fDi markets) enable the subscriber to look at individual projects and to analyse trends by different project type. Nor is it straightforward to make comparisons with the annual reports from competitor agencies, even were they willing to share them. The reason is that different national **Investment Promotion Agencies** (IPAs) measure different things and in different ways. For example, several agencies include the number of ‘safeguarded’ jobs (i.e. sites that were at risk of closing down/downsizing but which agency support managed to mitigate). This is not a KPI currently measured in Lithuania (although, in the medium-long term, it will inevitably become an increasing focus as existing investors review their global sites and operations).

#### 4.1.2 Detailed recommendation

We recommend that from October 2017 to June 2018, the Lithuanian authorities review the strategic framework for attracting innovative FDI. This strategic overhaul should include revising the definition of R&I projects, introducing new criteria to support decision-making and reviewing the target sectors and source countries for innovative FDI.

First, we recommend that a **new ‘umbrella’ term**: research, development and innovation (RDI) be adopted and that this should be based on a clear definition, including classification criteria, of the different types of R&I projects. Currently, InvestLT distinguishes between **“pure R&D projects”** (i.e. an investment whose core function is, for example, a research and development centre for new drug discovery) and **“projects with an R&D function”**. The latter could be, for example, a manufacturing site which also has a small product development unit.

We believe this is a logical way of defining R&D/innovation FDI but we would also recommend a separate category for software/IT development centres. These are definitely innovative FDI projects, employing highly skilled and well-paid personnel, but clearly differ from something such as a biotechnology, lasers or robotics R&D unit.

Figure 26: Recommended classifications of R&I investment projects

Type of R&D project	Characteristics
Pure R&D project	Investment is clearly and solely focused on research or development
Project with an R&I function	Investment whose core function might be, for example, manufacturing, but which has an R&D or innovation-type function as part of the project
Software/ICT development centres	Investments whose core function is some form of ICT software development. (If the project relates primarily to hardware or electronics or something like bioinformatics, then it would belong to the pure R&D projects.)

We recommend using the International Labour Organization’s ISCO-08 classification as a means of classifying individual investment projects and the quality/eligibility of the jobs<sup>47</sup>. This would also have the added benefit of increasing the chances of success of applications for R&D-related investment incentives and instruments.

Finally, we recommend a further review of the KPIs. The KPI of 20 % of projects being “pure R&D” is unrealistic – it does not reflect market reality either in Lithuania, Central and Eastern Europe (CEE) or even Western Europe. **A 10 % target would be more realistic but still very challenging.**

#### 4.1.3 Key operational steps and timeline

The implementation of this process would be led by Invest Lithuania but we recommend that this involves dialogue with key existing investors (both foreign and Lithuanian) and other relevant stakeholders in the Lithuanian science and innovation ecosystem.

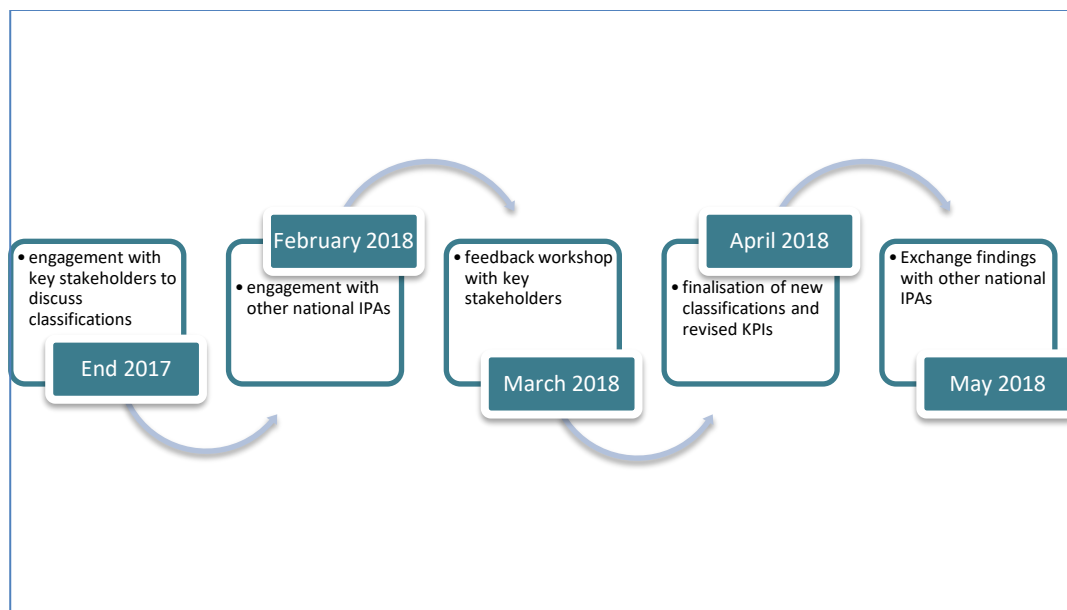
We also strongly recommend engaging with other national IPAs, such as Denmark, Ireland and Sweden, to investigate their approach to this issue. In so doing, Lithuania will learn from others and increase awareness about what is required to improve performance in meeting RDI investment promotion targets.

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<sup>47</sup> <http://www.ilo.org/public/english/bureau/stat/isco/isco08/>



Figure 27: Timeline for revising innovative FDI classification and KPIs



## ***4.2 Review the sector and country targeting to improve coverage of most likely sources of innovative FDI***

### **4.2.1 Analysis and rationale**

#### **Sectors**

It is beyond the scope of our work to provide a comprehensive review of the sector- and country-targeting strategy for FDI, in general, and for R&D/innovation FDI, in particular. However, we consider that a critical gap in InvestLT’s FDI target sectors is the absence of the cleantech and energy sectors. Both these areas (energy is often considered as a sub-domain of cleantech) are global megatrends that present challenges to all countries, including Lithuania. They are areas of major investment by venture capital, and digital innovation is transforming the cleantech space, particularly in the context of smart cities.

InvestLT has also identified the need to develop specific value propositions relating to R&D for ICT, life sciences and robotics. Fintech is another area InvestLT has identified as an opportunity. It is a key disruptive technology with much start-up activity around the world and is also a good fit for Lithuania in that it leverages the country’s proven competence in digitalisation/software and its strong record in attracting back-office financial services investors (e.g. Barclays).

There are some general observations. First and foremost, pure R&D investments are challenging projects to win as they are risky investments and are more easily won through proactive aftercare (investor development). As an example, IDA Ireland has been extremely successful in its investor development and has a highly effective process in place that could be learnt from. Secondly, life sciences is a globally competitive area in FDI terms and the reality is that there are few R&D FDI projects each year in Europe: according to *Financial Times* fDi markets, there were 224 R&D or design, development and testing investments in the life sciences cluster in Europe between 2012 and 2016, of which only 29 were in emerging Europe (i.e. on average, less than five per year). In contrast, there are vastly more cross-border alliances, partnerships and contract R&D in the life science sector.

## Countries

InvestLT's highest priority target countries are:

- Finland, Sweden, Norway, Denmark, Germany, UK and the USA
- Second-level priorities are Ukraine, China, Russia, South Korea and Japan

The choice of top-priority countries is logical as it is definitely easier to sell closer to home to Nordic and German investors. Both the USA and the UK are two of the world's leading sources of outbound FDI. Moreover, the UK will create some opportunities through Brexit and is a key hub of non-European companies' European HQs, so another source of 'deal flow'. The second-level markets are also logical as, likewise, many Japanese and South Korean investors have their main European HQs in Germany and the UK. Whilst we have not done a full assessment, **we believe there are some significant gaps** in this target list:

- Austria, France, Netherlands, Spain and Switzerland – e.g. in life sciences, French, Spanish and Swiss companies are all significant investors. The Netherlands and Switzerland are also the location of many European HQ of non-EU investors and are the location for relevant decision-makers.
  - Sweden should also be considered from the perspective that the Stockholm region has the highest concentration of Nordic/Baltic regional headquarters<sup>48</sup>.
- India: for example, in automotive, IT services and biopharma there are some very large Indian players. Estonia, for instance, has won an Indian pharmaceutical investment in manufacturing generics with some R&D to be

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<sup>48</sup> Global companies with offices in the Nordic region, a study of global and regional headquarters: Stockholm Business Region and Øresundsinstittuttet 2015

added (an example of a “manufacturing project with an R&D function”). Tata TCS has a number of interesting initiatives in Europe and is seriously looking for partners in its Co-Innovation Network (COIN).

- The Middle East is one to watch and to consider although perhaps more so for infrastructure, capital and VC-type investments.

## Competition

Market evidence from *Financial Times* fDi markets and other databases points to the main competitors being from the other Baltic and CEE states although the specific mix of countries depends on the sector and the type of project. For example, India and other long-haul locations can be competitors for IT shared services and software development.

InvestLT has identified as its general competitors for FDI across its target sectors:

- Main competitors: Bulgaria, Czech Republic, Estonia, Latvia, Poland and Romania
- Other competitors: Finland, India, Ireland, Norway, Portugal, Serbia, Ukraine

In our view, for high-end and pure R&D, Lithuania faces very tough competition from Western European and North American countries, e.g. in biotechnology R&D and/or manufacturing.

For **digital innovation** or ‘design, development, testing’ FDI projects, **Lithuania has enjoyed some very good wins** and a logical target would be to work with the existing investors which have IT-shared services functions to pitch for these higher-value-added roles. Competition is genuinely global for these activities. Lithuania has a good reputation with some high-profile investors (e.g. Barclays, Uber) and still offers a highly cost-effective solution (very good quality at a comparatively low cost). Competition here would include the USA, UK, Ireland, most other Western European and Nordic countries as well as CEE neighbours such as Estonia, Czech Republic and Poland.

### 4.2.2 Detailed recommendations

By the end of 2018, the inward investment division of Business Lithuania should review and reassess the target and country-sector priorities for FDI in general and specifically for R&I FDI:

- Review sector and sub-sector targeting with the goal of identifying the most promising FDI opportunities for Lithuania. This should include the full spectrum of FDI opportunities rather than just focusing on greenfield investment.

- The sector assessment should focus on the potential investment deal flow (i.e. the market size) in conjunction with the competitive strength of Lithuania's sector/niche FDI value proposition.
- Review country targeting priorities to consider the potential from other important European and global FDI source markets. In this process, it is also critical to consider the FDI investment decision framework to include consideration of European, CEE, Nordic-Baltic and global HQs and other key decision centres in multinational companies.
- Some key gap markets (e.g. Austria, France, India, Spain and Switzerland) could be approached through lead generation consultants so we recommend a series of pilot market-engagement projects to explore initial investor reaction and to raise awareness of Lithuania as a potential FDI location.
- China, Japan and South Korea are very difficult markets but definitely have potential and are particularly relevant in digital innovation and manufacturing industries. We believe that there needs to be a long-term strategy for these countries. However, this must be part of the larger overall strategy for political, cultural and trade relationships.
- The country and sector targeting review should be closely linked to the account management process as the overseas FDI staff should play a key role in the account teams.

Above all, both sector and country targeting must be grounded in market reality. For example, evidence from fDi markets shows that the number of greenfield life sciences R&D FDI projects in Europe is 10 times less than the number of design, development and testing investment in ICT in a given year.

Figure 28: Analysis factors framework for FDI sector and sub-sector targeting for Lithuania

### Analysis factors framework for FDI sector and sub-sector targeting for Lithuania

**Focus on Lithuania's strengths and/or future** opportunities (e.g. such as autonomous vehicles or 5G testing). It is not essential that Lithuania is the best location – but it needs to be 'good enough' to show investors some tangible, credible evidence.

- How competitive is Lithuania's value proposition – especially in the sectors where very highly skilled talent is the most critical factor (e.g. in life sciences)?

**Niche-value propositions can also be developed successfully concerning very specific assets/resources**, e.g. a special economic zone (SEZ), life science or other centre of excellence, a newly developed site, a site being converted for reuse, etc. A good example would be the Google data centre in Kotka, Finland<sup>49</sup>.

**What is the size and growth of the FDI market**, either currently or with evidence of significant medium-term growth potential:

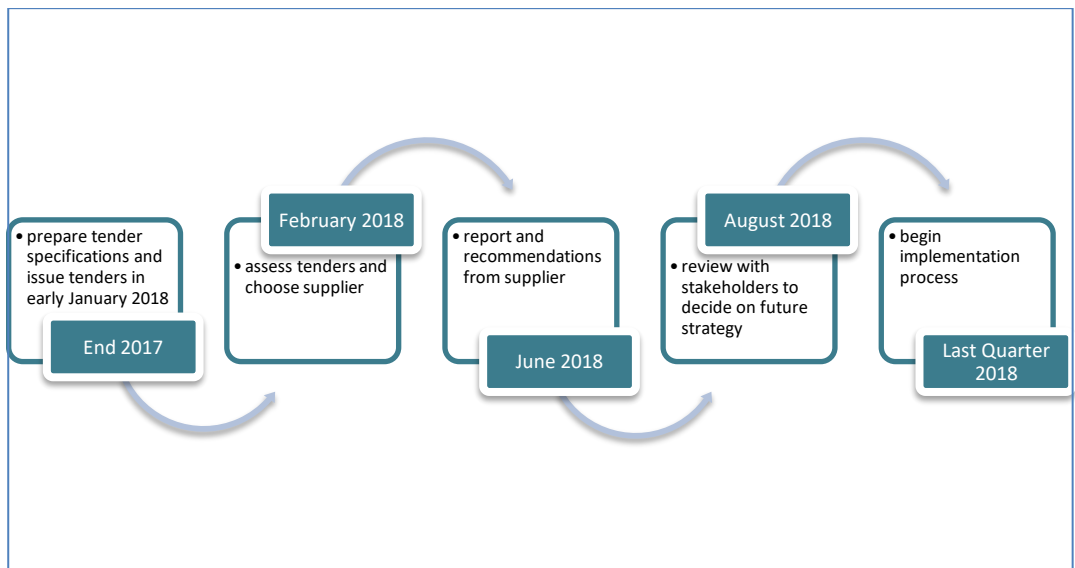
- What is the average number of projects per year into Europe, CEE and the Nordics?
- How many direct (and indirect) jobs, on average, are created by such investment projects?

**Target projects are of a scale for which Lithuania can actually compete**, e.g. Lithuania does not have the capacity to attract an investment requiring 5000 personnel in shared services. For some investors, the potential for scaling-up activities can be a key factor. This is a common limitation for all smaller countries.

**Evidence of other types of FDI** in the target sector: e.g. cross-border R&D contracts; innovation pilot projects; 'jvap' joint-ventures, alliances and partnerships; M&A; venture capital.

### 4.2.3 Key operational steps and timeline

Figure 29: Timeline for review of the sector and country targeting



<sup>49</sup> <http://arcticstartup.com/article/google-aalto-university-and-cursor-to-focus-on-south-eastern-finland/>

### **4.3 Shift toward FDI aftercare strategy based on strategic, key account management**

#### **4.3.1 Analysis and rationale**

Evidence from the annual reports and KPIs from some of the most successful European investment promotion agencies clearly shows the importance of aftercare in developing long-term sustainable FDI. Exemplar agencies include IDA Ireland, Invest Northern Ireland and Scottish Enterprise. It is also a fair observation that the importance of aftercare is not truly reflected in the private greenfield FDI databases. This is not an overt criticism of such databases – it is merely an observation of their limitations. It is often the case that additional job growth (and often retention) is not reported in the media and, consequently, is not captured by the FDI databases.

InvestLT does not have a systematic strategy in place for aftercare/investor development of existing foreign companies although it does hold a great deal of information about its clients and their investments already made in Lithuania. Data from the background report to this PSF exercise shows that foreign investors create substantially higher value-added than Lithuanian companies.

There has been no systematic mapping or SWOT analysis of the existing base of foreign investors. The overall KPI for InvestLT has been oriented 60/40 in favour of winning new investments (from new companies) versus follow-on investments. Historically, there was greater emphasis on aftercare but this has shifted because of the need to increase the number of foreign companies in Lithuania. We consider this was a logical decision at the time because, relatively speaking, the stock of FDI in Lithuania is low compared to, for example, the Czech Republic, Estonia and Poland.

The shift towards a key account management model will have significant resource implications, details of which are covered in more detail in section 4.4 (Resourcing to attract FDI).

As an example, IDA Ireland has been extremely successful in its investor development and has a highly effective process in place that could be learnt from. In particular, the goal is to rapidly ascertain an investor's long-term potential. This presents different levels of services at key stages in the investor's development and involves a team-based account management approach.

Figure 30: Example of an aftercare service model: IDA Ireland's eight-stage model

Stage of investment	Descriptive	Service solution
1. Establishing start-up	Initial new-new FDI case Typically 6-18 months	New business executive supporting project implementation
2. Satisfactorily carrying out parent mandate	Company achieves its operational performance goals	Transfer to company development executive at national level, supported by regional office; move to investor development programme
3. Performing mandate in superior way	Critical phase: entity either establishes credentials as a 'rising star' or fades into the crowd of global business units	Recruitment, skills, training; access to local specialist suppliers; support for product/process development/testing; financing
4. Extending the basic mandate	Company begins to add extended functions and activities	Partner with local managers to get support from KDMs at European/global corporate HQ; overseas IDA staff plays key role; coordinated support with other Irish govt. agencies
5. Extending mandate – strategic development	Migration to value-added functions: R&D, design, strategic marketing, VA production and logistics; customer support and shared services	Similar to role in 4: overseas staff play an increasingly active and important role
6. Becoming strategic centre for the corporation	Unit becomes key centre at European or even global level for function or business line – a unique competence centre in the global entity	Extensive support provided in Ireland and internationally; political-level involvement; tailored incentives programme to support development
7/8. Become a strategic pivot or apex	Migration from functional remit to high level of global autonomy and influence	Bid support, high-level networking, influencing key opinion formers, embedding companies into local and national economic policy.

### 4.3.2 Detailed recommendations

By the end of 2018, the Investment division of Business Lithuania will have developed a key accounts strategy in order to identify those existing foreign investors with the greatest potential for migration to R&I and other higher-value-added functions in Lithuania:

- Re-focus the KPIs so that the overall balance for aftercare should account for 60 % of all FDI jobs and 80 % of R&I FDI jobs;
- Appoint a dedicated aftercare lead and two assistants;
- Map, segment and prioritise the existing foreign investors in order to identify the cohort of companies that will be account managed as against more indirect support;
- Produce a SWOT analysis for each individual key account which would form a key component of the account plan;
- Develop key account plans which include named account managers, account teams and KPIs for each of the key investors. Key account plans would be reviewed at least twice yearly and ideally would also be co-developed with the investors themselves;
- Aftercare relationships would mainly be with the investor's Lithuanian country management but Business Lithuania should also be looking to develop strategic relationships at other levels e.g. Nordic/Baltic, EMEA or global HQ – and/or the main R&D leadership units in the case of R&D investments;
- Assign a number of key accounts to more experienced business advisors, which should also include regional managers and possibly the head of the investment division:
  - Once trained, city/regional economic development agencies should also be part of the key account management team. In time, this process could be developed so that city/regional agencies also replicate the process for those companies (foreign and Lithuanian) that are key to their own location;
  - Ministry of Foreign Affairs staff and/or Business Lithuania overseas staff should also be a key resource in the account management process. Their role would be to engage with the investors' global, European or Nordic-Baltic headquarters as part of a coordinated strategy.



## Example segmentation approach for FDI investors used with other IPAs

Mapping and segmentation of the existing foreign investor base will have the goal of prioritising those of most critical importance to Lithuania and those with the most potential. The segmentation model is based on a simple process which categorises investors into four segments, analogous to air travel: first class (a handful of investors nationally), business class, premium economy and economy.

An account management approach that is linked to the segmentation model: first class are all account managed, possibly even with a minister involved (which used to be the case in the UK). Business class are also account managed. Premium economy and economy class are managed mainly through events and digital communications.

*Source: MCJ Lemagnen Associates Ltd.*

### 4.3.3 Key operational steps and timeline

We believe that the transition to an account-management-based approach is critical for Lithuania, not just in the context of attracting more R&D FDI but for FDI attraction, expansion and retention as a whole. This goes hand in hand with recommendation “2.2 Segmentation and targeting of support to companies with growth potential”. The key difference for foreign investors is that the account management relationship with investors is multifaceted with key executives from different levels and units of the company around the world: from the country manager in Lithuania to the global HQ, possibly even to the global CEO in some cases. This means that Lithuania’s government agency overseas staff have a significant role in the aftercare process, which is discussed in recommendation 4.4.

For this recommendation, the steps and milestone proposed are as follow:

End 2017

- revise aftercare to 60 % of all FDI jobs and 80 % of R&I FDI jobs in InvestLT KPIs for 2018
- appoint dedicated aftercare team leader in InvestLT

February 2018

- Recruitment/appointment of two dedicated aftercare team assistants
- Preliminary identification of five to ten key investors to serve as a pilot group for account management
- Design specification for key account plans and SWOT analysis

- Initial selection and training (where needed) of pilot account managers and account management team

March-May 2018

- Segmentation and prioritisation of existing foreign investor base
- Complete SWOT analysis of top five to ten key investors
- Development of account plans for account management plans and account teams for pilot group of five key investors

May-September 2018

- Initial key account engagement, in Lithuania and overseas, and review of initial pilot key accounts process
- Develop key account plans and teams for the next five key accounts
- Development of pilot account-management solutions for second-tier accounts

October-December 2018

- Review of the process and existing key account plans
- Review of second-tier accounts pilot
- Set KPIs for 2019

2019

- Training programme for new account managers and wider account team
- Roll-out of process and review against KPIs

#### ***4.4 Reinforce the staffing available to attract FDI, notably in the overseas network***

##### **4.4.1 Analysis and rationale**

There are two main organisations responsible for attracting FDI:

- Invest in Lithuania (Invest LT), the national investment promotion agency, which reports to the Ministry of the Economy

- Lithuanian embassies and consulates, which are part of the Ministry of Foreign Affairs.

These are supplemented (currently to a very limited extent) within Lithuania by economic development/business support functions at the city level (e.g. Go Vilnius).

Invest in Lithuania is the national public agency, mandated to attract FDI from international companies. A preliminary observation is that InvestLT's balance of staff is quite different to competitors such as Estonia. In particular, InvestLT does not have any dedicated overseas teams, which in our view is significant for proactive investor targeting and aftercare account management. Another key point is that InvestLT's new regional officers can play a critical role in the aftercare process.

InvestLT is highly dependent on partners in the science and innovation community for its sales and marketing of R&I intensive FDI. Whilst there are some examples of excellent cooperation, as a whole this is not optimal and is a key constraint on the ability of InvestLT to deliver R&I type FDI – in particular from companies that do not currently have a presence in Lithuania. This relates in particular to the effectiveness of cooperation between business and science – but Invest Lithuania is also challenged because it cannot ascertain the quality of what universities have to offer in terms of research. MITA has an important role to play in this respect and is the key partner agency for Invest Lithuania.

### **Within Lithuania**

Invest Lithuania has a team of 55 in Lithuania of which 44 have a core role relating to FDI work. There are 22 in the business development team, split into three main sector teams: business services; manufacturing, and technology. This would appear to be a well-resourced team and is much bigger than the Tallinn team in the FDI unit of Enterprise Estonia.

Invest Lithuania is in the process of hiring three more regional managers, bringing this to a total of four. They will not have regional offices in Invest Lithuania (like the model of IDA Ireland) as it is considered that the cities and regions themselves should also have economic development personnel to support the regional managers. It is also felt that the current cities business support personnel are both insufficient and have significant skills shortages. We agree with the regional managers concept proposed by Invest Lithuania and feel that, to be effective, it is essential that organisations like GoVilnius exist, with sufficient resources and good training to develop the confidence and competence of the business-focused staff. It is very important that cities are committed to business support and economic development work as this will be critical to increasing the attractiveness of locations outside of Vilnius to both foreign and domestic companies.

The cities of Vilnius, Kaunas and Klaipėda have also established their own units which will have a role in supporting InvestLT's work. These city agencies will mainly assist InvestLT in operational work, rather than acting as a proactive investment promotion agency (IPA) such as those in larger countries (e.g. in Poland, regional IPAs are doing their own lead-generation work). We believe that the cities can be a valuable additional resource, play a critical role in investor aftercare key account management (see recommendations) and can have a potentially significant impact in improving local business-science-government cooperation. However, to achieve this will require significant training and best-practice guidelines across the country.

Invest Lithuania works with different stakeholders across the country to help coordinate visit programmes and to identify universities' R&D offers. The overall impression is that whilst this works reasonably well, there is much room for improvement. Experiences of working with the universities are very mixed, although some in particular receive praise. However, overall the level of cooperation with the universities needs to improve with the latter becoming more business-oriented.

## **Outside of Lithuania**

**In our opinion, Invest Lithuania is under-resourced overseas.** Its overseas representation is via the part-time service of commercial attachés and officers in the embassies, with each one having a KPI commitment to do FDI work. Unlike many other national IPAs, in effect, Invest Lithuania has no dedicated overseas personnel under its direct control. This is not a satisfactory arrangement, particularly for R&I-type investments which are strategic in nature and have a long 'gestation' period.

InvestLT is atypical compared to other countries' inward investment agencies in that it does not have any overseas offices or personnel. Estonia and the Czech Republic have FDI teams and/or export promotion teams directly reporting from different countries around the world. CzechInvest has seven offices in six countries. Although overseas personnel and offices can be costly, they are a critical resource for attracting higher-quality FDI. The Netherlands Foreign Investment Agency(NFIA) has an even more extensive overseas office network with seven locations in the USA and four people in the UK. IDA Ireland has a large presence in the US market. Whilst near-to-home markets can be managed (to some extent) from Lithuania, more remote markets, in particular in the USA and Asia, really require a local presence to make a significant impact on FDI attraction.

Currently, InvestLT is not proactively targeting the global, European, Nordic/Baltic or CEE headquarters functions of non-European multinational companies. The European/regional HQs and other key decision-making units in

North American companies can play a critical role in FDI decision-making in Europe. Key locations are London/SE England, Dublin, the Amsterdam area, Switzerland, Germany, Austria, Brussels and Sweden (for Nordic/Baltic).

The Ministry of Foreign Affairs (MFA) has a network of embassies and consulates. All staff are employed by the MFA which works closely with InvestLT to agree objectives and plans. InvestLT also helps to train and brief MFA staff. However, there are no dedicated full-time-equivalent (FTE) investment promotion resources at the overseas missions. Furthermore, MFA staff are also having to service many other roles – for example, exports (Enterprise Lithuania), tourism, agriculture and transport, as well as supporting official visits by ministers.

Also, as the majority of the MFA staff are economic/commercial diplomats, these staff are regularly (every three years) moving to other countries. With only a much smaller team of 'locally engaged' staff, this is very challenging for the development of long-term relationships and key account management with the most important foreign investors.

#### **4.4.2 Detailed recommendations**

We believe Business Lithuania should have dedicated overseas teams, focusing solely on inward investment, reporting directly to Vilnius, which is the case for IDA Ireland, NFIA and Enterprise Estonia. Ideally, we would like to see a model where there are dedicated 'invest-in' personnel, co-located in Lithuanian embassies or consulates, and reporting directly to Invest Lithuania. However, this clearly needs further consideration and discussion with the MFA.

Within Lithuania, we believe it is imperative for the Lithuanian municipalities to commit to investing in a local economic development/business support team and that part of this role should be FDI related. This can potentially be a key resource for both account management and supporting visits, together with the Business Lithuania regional manager. The team should use common methods and practices and receive regular training and mentoring. The alternative would be to significantly increase the number of InvestLT staff around the country, although we do not believe this would be desirable as it does not commit local cities to engage in their own economic development.

Specific recommendations to be accomplished by 2020:

- In Lithuania
  - In Lithuania – expand and increase resources to include a network of investment promotion officers at each of the main city economic development agencies across Lithuania, supported and mentored by Business Lithuania's regional investment managers.

- Implement a national inward investment training and quality training process for city economic development personnel by 2020, to ensure high-quality, best-practice services and to increase cities’ commitment to business and FDI support.
- Overseas
  - Strategic assessment of the opportunities and challenges of establishing direct in-market employees from Business Lithuania or a dedicated resource within Ministry of Foreign Affairs’ embassies/consulates;
  - Creation of a dedicated ‘invest-in’ overseas network in each of Lithuania’s core and secondary target markets. In larger core target markets (larger meaning either geographically and/or FDI investment volume potential), there would be at least two FTE-dedicated resources. These overseas staff would work on winning new investments as well as being a key member of aftercare key account teams.
  - Supplement the overseas resources by working with Lithuanian diaspora organisations (e.g. overseas ambassadors’ network) and bilateral chambers of commerce.
  - Where required, selectively use outsourced resources (consultants) to supplement lead-generation and other FDI marketing work in appropriate markets.
- All new resources in Lithuania and overseas must be given a programme of ongoing training and mentoring to increase their confidence and to ensure they are quickly up to speed with the Lithuanian FDI framework and account-management process.

#### **4.4.3 Key operational steps and timeline**

Clearly, our recommendations would have significant practical and budgetary implications for both the overseas network staffing model and the level of commitment of the municipalities and/or regions in Lithuania. Whilst the authors prefer the IDA Ireland overseas model, because of the direct line of reporting to Vilnius, some sort of hybrid model might be more suitable for Lithuania, e.g. the old UK Trade and Investment was a joint function between the Foreign Office and various evolutions of the Department of Trade and Industry.

We propose the following milestones for implementation of the recommendations:

December 2017: hiring of InvestLT regional managers

January-March 2018:

- InvestLT and Ministry of Foreign Affairs explore feasibility and potential for a dedicated invest-in resource (either InvestLT staff or contracted resource within the Ministry of Foreign Affairs)
- Identify pilot overseas markets, linked to developing the key account-management process

March-June 2018:

- Initial training workshop for economic officers in Kaunas, Klaipėda and Vilnius
- Initial 'recruitment' of overseas staff in pilot markets

July-December 2018:

- Engagement (e.g. group session in Vilnius or national roadshow) with other main cities/regions to promote the benefits of economic development officers and their potential benefit to attract foreign investment
- Teams in Kaunas, Klaipėda and Vilnius introduced into account-management process
- Review and recommendations from overseas pilot projects

2019-2020:

- Expansion of overseas teams in priority target markets. Appropriate resourcing linked to the key account-management process and to potential investment flows from individual target markets, e.g. ideally, the USA should have both a west- and east-coast presence
- Pilot outsourced exploratory lead-generation representation in selected target markets
- Roll-out of national network of city economic development officers and implementation of quality standards process in investment promotion assistance (note that this could also include other business support work for Lithuanian businesses).

## ***4.5 Attraction of alternative modes of innovation-oriented FDI projects and activities that are precursors to FDI***

### **4.5.1 Analysis and rationale**

Investment Promotion Agencies (IPAs) around the world have differing mandates in terms of the types of FDI opportunities, which include: greenfield and expansions; M&A; growth capital (VC and corporate venture capital); and cross-border R&D contract/partnership facilitation and talent attraction (including attraction of entrepreneurs to establish or relocate their start-ups). Talent attraction is covered in section 4.6. The vast majority of IPAs have traditionally focused on attraction of so-called greenfield (organic) FDI – that is foreign companies which establish/expand their own operations in their country.

Invest Lithuania's core mandate, reflected in its KPIs, is to focus on greenfield investments (both new investors and follow-on expansions/new projects from existing foreign companies). It does not normally get involved in M&A investments, nor does it actively promote this as a service (which is the case for the vast majority of IPAs across Europe and North America).

Two key points that would warrant Lithuania allocating resources to M&A investment are:

- On average, cross-border M&A deals account for at least 50 % of the total number of global FDI investments;
- Some of the highest profiles and most successful foreign investors in R&D-intensive sectors originated from acquisitions of existing Lithuanian companies; Thermo Fisher is a prime example;
- Given that Lithuania is highly committed to growing its technology start-up ecosystem, there is an implicit need to facilitate and market these start-ups to international investors, both for follow-on rounds and for M&A exits. The market reality is that trade sales are by far the dominant exit strategies for technology start-ups.

To function, a thriving and dynamic technology start-up ecosystem needs capital investors (angel, venture capital, corporate venture capital and private equity). As in most European countries, even more so in CEE, there is a critical lack of indigenous 'growth' capital in Lithuania. In some countries, notably Ireland, state-owned 'VCs' also play a very important role.

### **Venture capital**

Attracting international VC and corporate VC is not part of Invest Lithuania's mandate – it seems likely that this falls more naturally into Enterprise Lithuania's remit, given the nature of its client base. There are examples where



IPAs have been highly successful in facilitating this type of investment – notably the Helsinki Business Hub model. Enterprise Ireland could be considered another good example although it is a VC in its own right with a large portfolio of companies. It is also ‘mission critical’ that the Lithuanian angel and VC community should be heavily involved in any such initiatives.

Given that Lithuania is highly committed to growing its technology start-up ecosystem, there is an implicit need for support in attracting both corporate and VC investors. In the latter case, the VC Zone<sup>50</sup> (now called Investors Services) model developed by Helsinki Business Hub (HBH) (formerly Greater Helsinki Promotion) is a good example of how an investment promotion/economic development agency can be an important player in this process. At present, there is no evidence that any Lithuanian government agency is proactively engaged in attracting international VCs. Helsinki Business Hub has had considerable success in these areas since 2007. Feedback from VC stakeholders during the consultation process suggests that something akin to the Helsinki International VC Zone model<sup>51,52</sup> would be of value for Lithuania.

## The Helsinki experience – from International VC Zone to HBH Investor Services

**Original rationale:** “An initiative aimed at providing top-tier, technology-focused international VCs with an easier way to conduct business in the Nordic countries and find interesting companies for potential investments and/or partnerships.”

History:

- The Initial concept was first explored in 2007/2008 by Helsinki Business Hub (then known as Greater Helsinki Promotion) and Technopolis Ventures (Technopolis OY, a major technology park operator in the Nordics and Baltic sea countries). At the time, the HBH was the financing partner and Technopolis provided the service delivery. HBH also provided personnel.
- By 2009/2010, Aalto University had become a partner, the Helsinki International VC Zone brand was established and a website has been created. Sitra (the Finnish Innovation Fund) and the city of Tampere became partners after 2010.
- From the outset, whilst HBH was one of the key drivers and funders, the model always took a Finland-wide perspective. The clear rationale for this was that Finland is a small country with, at that time, a relatively small start-up ecosystem. Indeed, the international VCs were interested in target investment companies from anywhere across the Nordics and Baltics.

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<sup>50</sup> <http://www.helsinkibusinesshub.fi/from-margins-to-mainstream/>

<sup>51</sup> <http://helsinkibusinesshub.fi/helsinki-international-vc-zone-launched-at-moneytalks-forum/>

<sup>52</sup> <http://www.helsinkibusinesshub.fi/how-one-small-city-attracts-dozens-of-international-vc/>

- 2014/15 Invest in Finland/Finpro launched its own concept (led by a former HBH team member). Today, the service is known as HBH Investor Services with HBH as the financier and delivery partner.

#### Concept:

- The VC Zone partners identified a target list of about 70 international VCs from Europe and North America.
- The original value proposition was effective access to deals for international VC companies. HBH would send the VCs a pre-screened list that meet their criteria on paper. So, effectively, the VC Zone partners in Finland offered a scouting and matchmaking service.
- The emphasis was on delivering excellent service: making the meetings happen. When the VCs actually visited, they received red-carpet treatment – really high-quality introductions, not just to the potential deal flow, but also to the local investment community and any other highly relevant stakeholders (e.g. sometimes also meeting expert groups within Finnish universities).

#### Extended concept:

- From 2012 onwards, the concept evolved with the creation of a 'deal-makers club', which focused on working with the local (Finnish) growth capital investment community, e.g. entrepreneurs, board members, angels, VCs.
- It is important to note that the HBH and Will Cardwell (at that time, Aalto Centre for Entrepreneurship) were firm supporters of Slush and Arctic Startup, two organisations that have been at the forefront of the emergence of the Finnish tech start-up scene.
- Typically, the value of first and second rounds deals is €1-10 million. The model that evolved made it an even stronger value proposition for international VCs. Although interest was still primarily in the early-stage start-ups, introductions could therefore be a lot earlier – some even wanted to visit the universities to meet future entrepreneurs. There has always been mutual interest in meeting other VCs as well as the limited partnerships (LPs) and institutional investors in Finland.

#### Impact:

- First and foremost, investments in Helsinki/Finnish start-ups from VCs that would not otherwise have happened.
- Beyond money: the quality of the investors themselves (their expertise, networks and global visibility).
- Benefit to the local investment community, increasing and augmenting their networks.
- Since being founded in 2008, VC Zone members have made 39 investments in Finnish companies in rounds totalling over EUR 230 million. In 2014, VC Zone arranged some 130 meetings between foreign VCs and promising Finnish start-ups.

#### Key learnings<sup>53</sup>:

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<sup>53</sup>Based on an interview, in August 2017, with Micah Gland, former CEO of the HBH, and now a member of the Arctic Startup team.

- It may be advisable to start with the deal-makers concept first. However, the earlier success of the International VC Zone model gave its members a great deal of credibility it would not otherwise have had.
- The deal-makers club itself must really be the '*crème de la crème*' of the local growth capital community: really significant individuals (who might include people from the public sectors, universities and economic development bodies). It is essential to be highly selective in eligibility for the deal-makers club – only those who are going to be committed, who really add value and who will be credible to international VCs. Real commitment means having regular, scheduled meetings and reacting to opportunities to 'pull out all the stops' when needed. It is recommended to 'start small' to get the concept off the ground.
- Even in Finland, the level of potential deal flow is relatively limited compared to larger countries or even cities (e.g. London, Paris). Thus, for Lithuania, this will be an even bigger challenge in attracting international VCs. Lithuania would be best advised to engage with other countries in the region (Estonia, Latvia, Poland and the Nordics) to explore joint initiatives. The risk is that different country partners may think in narrower horizons, not seeing the bigger-picture benefits to the international VCs of an enhanced regional offer.

### **Innovation pilots 'living labs'**

The possibility of marketing Lithuania as a location for 'living labs' or open innovation-type demonstration projects is not something currently being pursued by Invest Lithuania, although there are several such initiatives and programmes in the country – mainly focused on local companies. Whilst it does not immediately create permanent FDI, it can be a very good way of presenting opportunities to international companies (large, medium and small) to come and 'taste' Lithuania and test out some innovative new technologies and business models. Copenhagen, Helsinki, Oslo, Stockholm and other Nordic cities are all doing this with some good successes. The key point is that these sorts of projects can be a precursor to a permanent FDI project. A recent initiative to attract technology-based FDI was a pitch to Tesla using Minecraft to build the GigaFactory 2 in the Kruonis free zone<sup>54</sup>, which is also close to a pumped storage hydroelectric plant. This type of innovative place-based promotion may be an example to follow.

### **R&D contracts and partnerships**

R&D contract/partnership facilitation is a critical component and precursor to attracting cross-border R&D-type FDI. This is true for both existing and new investors. InvestLT does work on such cases to some extent but it is a

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<sup>54</sup> <http://www.investlithuania.com/kruonis-technology-park/>

secondary focus. The ability of InvestLT to service these opportunities is highly dependent on the existing effectiveness of business-science cooperation in Lithuania. In dealing with such cases, InvestLT staff are not technical/scientific experts and therefore depend heavily on the competence and willingness of personnel in the clusters, centres of excellence and universities. In the current system, MITA was supposed to play the role as a key agency for this activity, for example, by supporting applications for financial incentives. Of course, there are many actors involved, not least the universities themselves, clusters and the science parks. InvestLT considers all these organisations as important partners and does indeed work with them when handling investment cases.

As is the case with open innovation pilot projects, R&D and other types of collaboration with universities and similar organisations are a key precursor to a foreign company establishing permanent R&D or an innovation centre. Logic and evidence from other countries clearly shows that it is far easier to propose such opportunities to existing foreign investors. This does, of course, depend on key factors such as the nature of the existing operations a foreign company has in Lithuania, the importance/visibility of the Lithuanian operations within the corporate group and – of critical importance – the level of the local country manager's 'ambition/hunger'. This is why a coherent aftercare strategy is of key importance in FDI operations – the best examples of this would be IDA Ireland, as well as both Invest Northern Ireland and Scottish Development International.

#### **4.5.2 Detailed recommendations**

We propose four actions to be taken during the period 2018-2020 to improve the promotion of Lithuania as a location for co-investment, testing and piloting by foreign investors:

1. Proactively market opportunities, Lithuanian innovation pilots, R&D contracts and partnerships to both existing and new foreign investors. These opportunities are precursors to FDI which also help to raise awareness of Lithuania as an innovation-oriented business location.
2. Develop a network to focus on attracting international VC investment with the aim of increasing the connections of the Lithuanian start-up ecosystem to Nordic, European and global VC networks. This will help to raise awareness of Lithuania as a 'tech start-up' location and increase the supply of angel and VC. Lithuania should give serious consideration to developing a concept such as the International VC Zone.
3. Encourage the development of pilot-testing platforms or projects which could include, for example, smart city piloting opportunities for new technologies such as autonomous vehicles testing or for 5G development. Several Nordic investment promotion and economic development agencies have been promoting pilots to both local and overseas

companies. Similarly, low-cost, short-term university innovation opportunities, such as the Démola network<sup>55</sup>, can be highly attractive to international companies. Open innovation and piloting opportunities in Lithuanian cities can be a very useful way of introducing innovative foreign companies to Lithuania as well as providing opportunities for local Lithuanian partner companies.

4. Business Lithuania's future FDI division should, at least reactively, start to promote M&A opportunities. For many international companies, M&A is their preferred expansion strategy. Corporate venturing firms are also constantly looking for innovative young companies. It is understandable that Lithuania would want to grow and retain strong local companies which could themselves become multinationals. However, for start-ups in particular, the investors and owners of these companies are looking for exit strategies and/or further investment to take them to the next stage. It is critical to remember that some of the most successful very high-tech foreign investors in Lithuania today originated from an acquisition. This is particularly critical for the start-up ecosystem to provide exit opportunities for founders, owners and investors.

#### **4.5.3 Key operational steps and timeline**

These four recommendations, whilst straightforward on paper, require great commitment with the added complexity of involving a range of partners in Lithuania itself as well as internationally. This cannot be achieved by one organisation alone; it will be an iterative process requiring organisations to be agile, flexible, collaborative, innovative and open minded. Innovation pilots, R&D contracts and partnerships will require building consortia and involving the science base, Lithuanian and foreign companies. Whilst the FDI division in the future Business Lithuania agency should still be the lead partner for managing relationships with foreign investors, cross-departmental task forces will be required to ensure that the required links between business and science are developed.

We propose the following milestones for the operational roll-out of the recommendations:

January-March 2018

- Establish a cross-organisation working group to investigate the feasibility of each of the four recommendations. We recommend there are dedicated subgroups with a focus on each of the four areas. Each one would have a

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<sup>55</sup> <https://vilnius.demola.net/>

lead or 'chair' organisation. For example, this could be a Lithuanian venture capital firm

April-September 2018:

- Working groups undertake feasibility studies and report back with recommendations and proposals for each of the four themes

October 2018-June 2019:

- Initial 'beta' programmes relating to the proposals from the feasibility work
- Review of the beta programmes in June 2019

July-December 2019:

- Implementation and roll-out of the most successful beta programmes
- Alteration and adjustment of less successful beta programmes

2020:

- Review of all programmes
- Full roll-out and implementation phase

#### ***4.6 Develop a talent attraction initiative to reinforce Lithuania's image as a place where innovators live and work***

##### **4.6.1 Analysis and rationale**

R&I centres (both for pure R&D investments and for software development) are strongly driven by the availability of the right skills base and accessing an attractive location for foreign workers (be they EU or non-EU).

##### **There are two aspects to talent attraction: Lithuanians and immigrants.**

Talent attraction is possibly Lithuania's foremost challenge in terms of retaining, attracting and expanding FDI. Most critically, Lithuania remains a net-emigration country with a forecast population decline, and there is a risk of further 'brain drain'. Despite there being a relatively high rate of employment, there is a shortage of skilled talent in various fields across industry as a whole.

All R&I centres are manned by very highly educated and skilled people. Both locally, in Europe and globally, the demand and competition for these skills is intensifying with demand clearly exceeding supply. It is ironic that the most

internationally mobile labour is, on the one hand, very highly skilled people and, on the other, those that work in low-skilled jobs.

Skilled Lithuanians can (and do) very easily find much better pay and career prospects in other countries, like Sweden, Germany, Ireland, UK (though less clear in the Brexit discussions) and even the USA/Canada, Australia and Singapore. Some IPAs, e.g. Enterprise Estonia, also have a talent attraction unit. Countries with large diasporas all face similar issues in trying to repatriate talent, e.g. to establish start-ups 'back home'. **Diaspora marketing** is an important potential tool for Lithuania that could be leveraged to support FDI attraction. There are several examples where Lithuanian diaspora have already been key factors in FDI cases (e.g. Fos, Uber).

**Immigration** is the other aspect of addressing skills shortages and one that remains controversial with the electorate. **EU nationals** may, of course, freely reside and work in Lithuania. It is essential to ensure that these people are given a 'soft landing' that supports their relocation in all practical aspects (bank accounts, housing, schools, learning the language, to name but a few). Realistically, it seems plausible that the majority of such people are going to be nationals from other CEE Member States. A more politically sensitive issue is facilitating the immigration of **non-EU nationals** from countries such as Belarus, Russia and Ukraine.

One observation from the different meetings and company interviews during our work is that the immigration rules are considered to be too stringent – although there was by no means a consensus that immigration is desirable. As one company CEO commented: **"we are already able to hire the right sort of immigrants when needed. The process is a little painful but it does work"**. There is a consensus that measures aimed at bringing back the diaspora should be a core priority.

**Attracting foreign entrepreneurs to establish start-ups in Lithuania** is already being done to some extent, with some proposals in place to facilitate immigration. However, we believe that much more effort should be focused on attracting entrepreneurs from the Lithuanian diaspora. There are already several examples of returning Lithuanians who have created business. The Back to LT<sup>56</sup> initiative is a great example of what is already being done by private companies to attract diaspora students and graduates.

In terms of the focus of talent attraction, a general observation is that whilst there still seems to be plenty of IT talent in Lithuania, sectors such as biotechnology and engineering have a much smaller talent pool and this is a

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<sup>56</sup> <http://www.backto.lt/>

globally scarce resource. It is estimated that half of the existing research workforce in the life-sciences space is working in academia, the healthcare system or a government research body. It is also the case that three large companies probably account for as much as 80 % of the corporate life-sciences workforce.

- In our opinion, this would be a very significant deterrent to any larger-scale new foreign investor in the life-sciences sector because they cannot be confident that they would be able to fulfil their hiring plans.
- Similarly, given that the life-sciences talent pool is very limited, the arrival of a new company, even if it only hired 50 researchers, would quite possibly be very unwelcome from the perspective of existing employers.
- If Lithuania is committed to being a serious competitor for life-sciences R&I FDI projects, this must be reflected in significant increases in the numbers of students and graduates (at BSC, MSC and PhD levels), supplemented by highly targeted immigration or talent repatriation.

Similarly, the over emphasis on training IT professionals may mean that the education system is at risk of not producing enough engineers in manufacturing and other industries.

Finally, **quality-of-life factors** become much more important for any project, which involves a significant number of international staff and, in our opinion, this is likely to be a serious weakness for Lithuania in attracting such projects. The difference in earnings levels between Lithuania and Western Europe would prove an extremely difficult (**and possibly unsurmountable**) challenge in attracting such staff. However, this may be a more realistic option for attracting talent from neighbouring Baltic countries (including Poland), Ukraine, Belarus and Russia.

#### **4.6.2 Detailed recommendations**

By 2019, we recommend establishing a dedicated unit within the new Business Lithuania agency with responsibility for talent attraction. The focus of the unit should be twofold: a) the Lithuanian diaspora and b) immigrants. In 2018, during the process of creating the new Business Lithuania agency, this unit could be incubated within InvestLT.

In our view, the highest priority should be given to the Lithuanian diaspora and could be launched as a pilot exercise during 2018-19. The aim would be to develop a process to attract potential entrepreneurs from the Lithuanian diaspora, including Lithuanian overseas students. There are already several examples of such cases. To achieve this, however, there needs to be a strong



mix of incentives to support such returning entrepreneurs (either start-ups or 're-shoring').

In our view, any policies that might be introduced relating to work/resident permits for non-EU personnel must have very clear guidelines and meet specific skills gaps. It is also critical to ensure that there is an efficient and effective process for **expatriate country managers and specialists** e.g. for US, Japanese, Chinese, Swiss and Norwegians.

Estonia has another interesting solution here: the e-Residency programme has already attracted over 1000 British applicants <http://www.howtostayin.eu/>. For non-Lithuanian nationals, we suggest considering a digital residency scheme, along the lines of the Estonian model<sup>57</sup>. This also has the potential to attract foreign entrepreneurs to establish a business in Lithuania as well as making it easier for international companies to administer their Lithuanian business.

Points to consider:

- Lithuania's biggest weakness is its brain drain coupled with an ageing population, yet with still relatively high unemployment. Other countries, such as Ireland and the other two Baltic states, face similar challenges. In the specific context of R&I FDI, availability of a good supply of highly skilled talent (both existing and student pipeline) is consistently rated as the most important location quality selection criteria.
- The tax regime for expatriate experts who are on short-term contract could be another factor. The workforce in FDI R&I centres often have a very international flavour; therefore, issues such as work and residency permits are of concern for non-EU staff. Although we have not examined this aspect in detail, it could become a critical factor.
- Immigration policy and procedures should be reviewed annually to ensure that the system is functioning smoothly and punctually, to identify and resolve problem areas, and to ensure that policy and process reflect Lithuania's key skills challenges

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<sup>57</sup> See <https://www.workinestonia.com/> as well the e-residency programme <https://e-resident.gov.ee/> managed by Enterprise Estonia [check link and spelling or e-residency or e-Residency (as above)].

### **4.6.3 Key operational steps and timeline**

Purely for the purposes of this document, we have called the proposed talent attraction unit 'WorkInLT'. The key milestones proposed are:

First semester 2018:

- Ratification of funding to initiate WorkInLT, possibly within InvestLT
- Hiring and appointment of unit director

Second semester 2018:

- Development of strategy and of the 2019 operational plan
- Hiring of initial team of three full-time-equivalent staff to support the director
- Consultation with stakeholders and establishment of working groups (one focusing on diaspora, the other on immigration)
- Working groups develop proposals and recommendations for pilot initiatives
- Workshop to discuss next steps and to agree operational plans for pilot initiatives

First semester 2019:

- Launch of pilot initiatives

Second semester 2019:

- Review of pilot initiatives and drafting of operational plan for 2020-2022 (as part of Business Lithuania's three-year rolling business plan)

2020:

- WorkInLT unit fully operational within Business Lithuania
- Implementation and roll-out
- Ongoing review of model and KPIs.

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To support countries in reforming their research and innovation systems, the Directorate-General for Research & Innovation (DG RTD) of the European Commission set up a Policy Support Facility (PSF) under the European Framework Programme for Research & Innovation 'Horizon 2020'. It aims to support Member States and associated countries in improving their national science, technology and innovation systems.

The Lithuanian Government expressed its interest in receiving specific support under the PSF on how to strengthen, attract and assist science-business cooperation and innovation-oriented foreign direct investment (FDI).

The PSF expert panel, of four independent experts, worked from January to September 2017 including two missions to Vilnius to consult with stakeholders. The expert's key policy recommendations, grouped into three themes, call for a more balanced policy mix to address the "gaps and inconsistencies" holding back wider-scale science-business cooperation. The panel also set out a range of options to help attract a more diverse range of innovation oriented foreign direct investments. Each recommendation is structured to provide detailed guidance, a timeframe and illustrative examples to inspire the required changes.

*Studies and reports*

