European Observatory for Clusters and Industrial Change

Policy Briefing – Lithuania

This policy briefing report was carried out for the European Commission by

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Selection as one of 10 regions in industrial transition

The customised advice on modern cluster policy in support of industrial modernisation provided to the 10 regions in industrial transition is funded by the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW), as part of the European Observatory for Clusters and Industrial Change (EOCIC). The regions were selected as a result of an open call for expression of interest, published and assessed by the Commission services. The Commission launched a first call for expression of interest on 29 September 2017 and, as a result of demand from regions, a second call was launched on 14 December 2017.[1]

The following regions were selected[2]:

- Cantabria (Spain)
- Centre Val de Loire (France)
- East & North Finland
- Hauts-de-France (France)
- **Lithuania**
- North-Middle Sweden
- Piemonte (Italy)
- Saxony (Germany)
- Slovenia
- Wallonia (Belgium)

The aim of the work being provided by the EOCIC to 10 regions in industrial transition is to define a set of actions in the form of a comprehensive strategy to foster regional economic transformation, identify collaboration and funding opportunities and connect with other regions in regional and cluster partnerships.

This pilot will help test new approaches to industrial transition and provide the European Commission with evidence to strengthen post-2020 policies and programmes.

The output of the first phase of the EOCIC advisory services was an assessment report, which summarises the key challenges of industrial modernisation for the region and the potential policy directions. The second phase of the EOCIC advisory services will build on this report to develop concrete policy proposals for each industrial transition region. DG GROW and the EOCIC are working closely with the Directorate-General for Regional and Urban Policy (DG REGIO) and the OECD to provide advice services for the pilot regions.

More information on the activities carried out by the EOCIC is available at the end of this report.

[1] Details on the selection procedure are available at: https://ec.europa.eu/regional_policy/en/policy/themes/industrial-transition/

[2] 12 regions were initially selected for the overall process of the project on pilot regions in industrial transition, of which 10 then engaged with the project through to the final stages of the work carried out by the EOCIC.

1. Introduction

1.1. Aims and objectives of the exercise

The aim of the work in Lithuania is to support the regional authorities and stakeholders in defining a strategy that facilitates the region's industrial transformation. In the case of Lithuania, the EOCIC work was carried out in close co-operation with the Lithuanian Ministry of the Economy, the AMI[3] expert – also funded by the European Commission – and the work of the OECD on Regions in Industrial Transition.

This document builds on the assessment report to summarise the challenges, barriers and drivers to industrial modernisation in Lithuania before outlining specific potential measures to be integrated into the regional policies for industrial transformation, together with a roadmap and an action plan.

This briefing is based on extensive desk research, a large number of interviews, a study visit (16 and 17 May 2018) and a policy review meeting (30 November 2018) in Lithuania. Throughout the process, there has been close co-ordination of regional meetings, research and outputs between the EOCIC team and the AMI expert. It is estimated that more than 60 regional stakeholders were reached directly via the study visit, policy review meeting and interviews.

The briefing provides input into a regional strategy focused on a "managed industrial transition" (Zuleeg et al, 2018), based on the insight that different regions across Europe are characterised by different assets, strengths and weaknesses, and that they face different obstacles and threats that need to be overcome. We adopt a tailored approach that builds on existing resources and we place considerable emphasis on generating and maintaining political commitment for the proposed activities.

Lithuania's industrial base consists of many small companies successfully integrated into international value chains, but not leading them. Therefore, the core challenge of industrial transition in Lithuania is identified as increasing the productivity of its workers even more rapidly than the current trend. Focusing cluster policy in Lithuania on achieving the strategic co-ordination needed for industrial transition can make an important contribution to addressing that challenge.

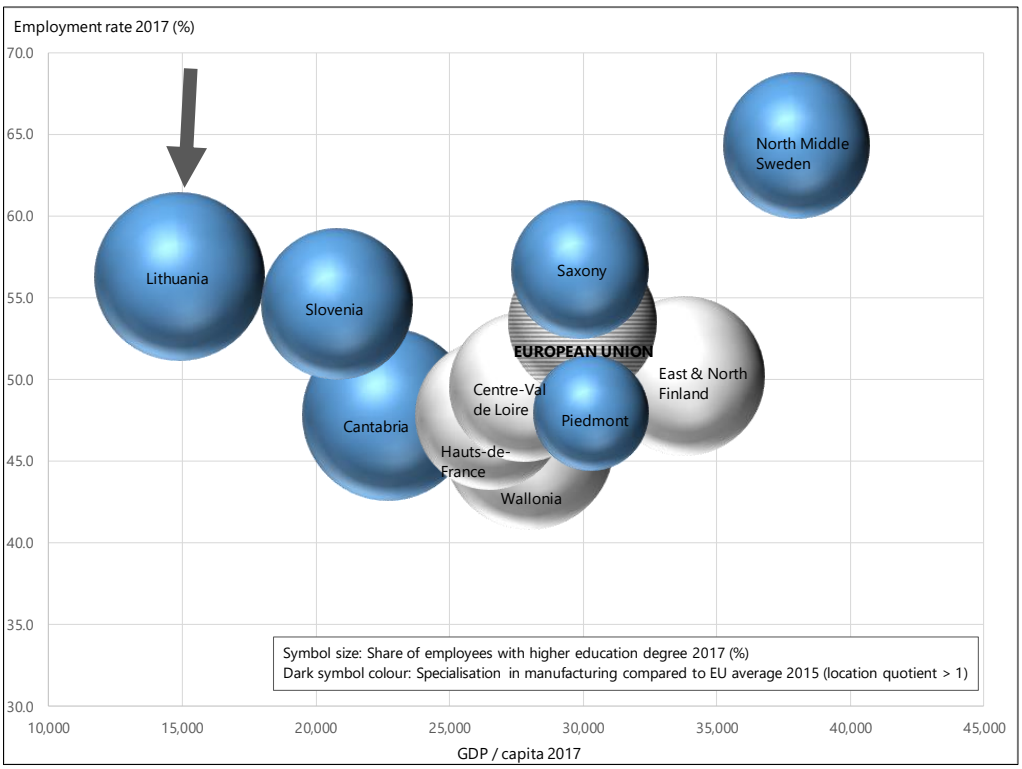
[3] External experts contracted by DG REGIO to provide support to the pilot regions in industrial transition.

1.2. Key economic and innovation indicators for the pilot region

In 2017, Lithuania had a gross domestic product (GDP) of EUR 14,900 per capita, which is below the EU level of EUR 30,000 and ranks Lithuania tenth among the pilot regions.

Figure 1 combines selected economic indicators for the 10 pilot regions. It shows Lithuania's good position in terms of the employment rate – the pilot region ranks third behind North Middle Sweden and Saxony. With 44.5% of employees with a higher education degree, Lithuania ranks third among the pilot regions and has an above-average level of highly educated employees compared to the EU average (34.4%). In relation to the European Union, Lithuania is specialised in manufacturing: its location quotient is 1.2015.

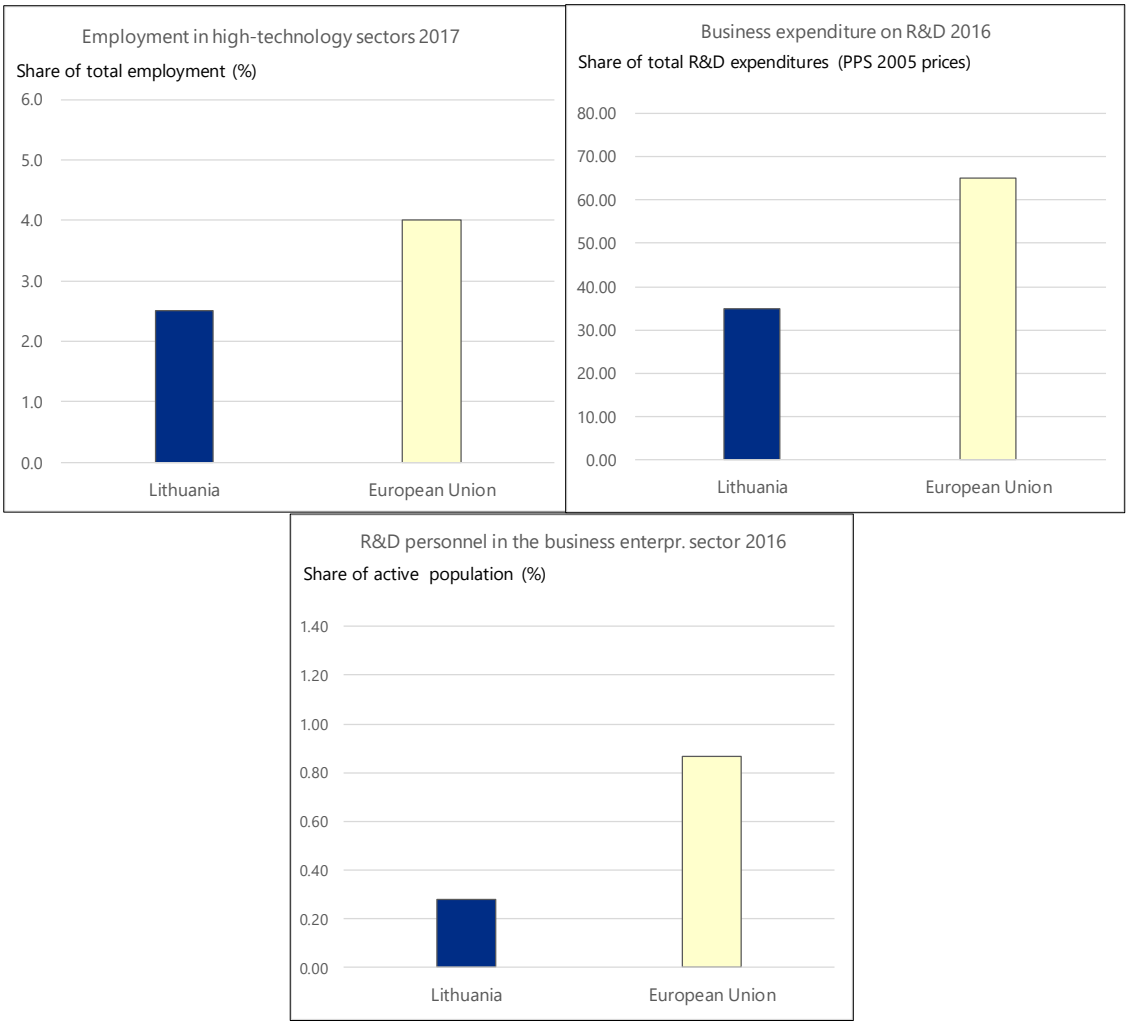
Figure 1: Selected economic data for the 10 pilot regions: GDP/ capita, Employment rate, Share of employees with higher education degree and Specialisation in manufacturing



Source: EOCIC, based on Eurostat data and own calculations

Lithuania's share of employment in high-technology sectors (high-technology manufacturing and knowledge-intensive high-technology services) is below the European average, and the Lithuanian business enterprise sector spends a lower percentage of total business expenditure on research and development activities than in the European Union. Lithuania's share of R&D personnel in the business sector is also below the EU figure (figure 2).

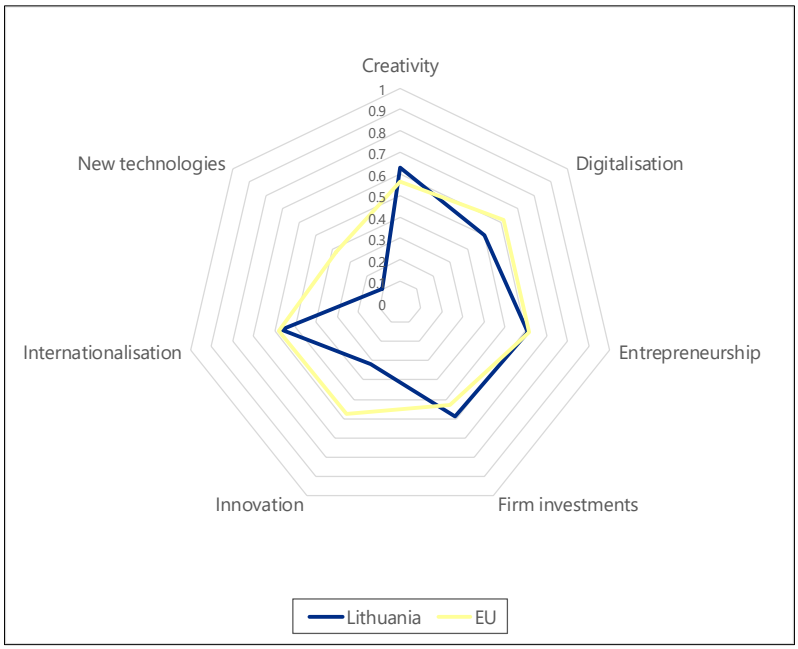
Figure 2: Selected technological indicators for Lithuania



Source: EOCIC, based on Eurostat data and own calculations

In order to provide insights into industrial modernisation, the European Observatory for Clusters and Industrial Change (EOCIC) provides composite indicators on seven dimensions: Evolution towards a more innovative regional economy; New and emerging technologies; Digitalisation; Firm investments; Internationalisation; Creativity; and Entrepreneurship. Each dimension is represented by a set of specific indicators, which are condensed to a composite indicator. Figure 3 presents the results for those seven dimensions in Lithuania. It shows that Lithuania displays high scores on the creativity, entrepreneurship and firm investments dimensions. The lowest scores are for new and emerging technologies, where Lithuania has the lowest score of all pilot regions. Lithuania's score on the digitalisation dimension is also below the EU average score. Lithuania achieves higher scores than the EU for both creativity and firm investments, and is close to the EU level on the entrepreneurship and internationalisation dimensions.

Figure 3: Composite indicators for Industrial Change: Lithuania

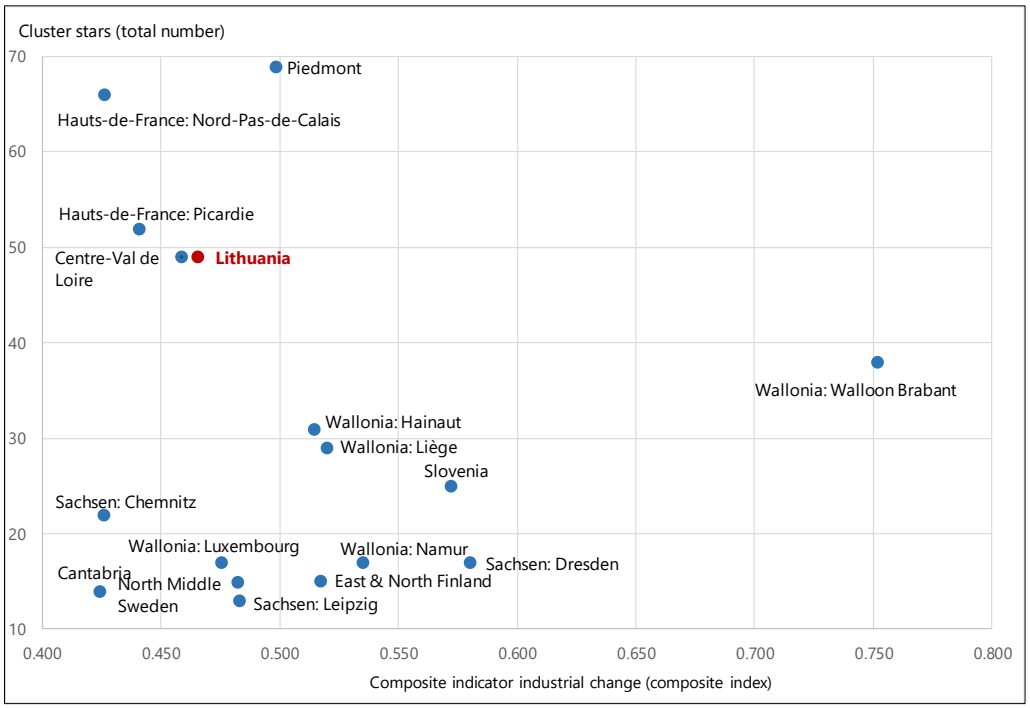


Source: EOCIC, based on various data sources and own calculations

Figure 4 shows the most recent total composite indices for industrial change and the total number of clusters stars in the pilot regions (NUTS2 level). The composite indices show industrial change in a range between 0.4 and 0.8, and the total number of cluster stars in a range between 10 and 70 in the 10 pilot regions. Five NUTS 2 regions have 45 or more cluster stars. Piemonte is the clear leader (69 stars). With 49 cluster stars, Lithuania also belongs to this group. By contrast, various regions have 20 or fewer cluster stars – among them North-Middle Sweden (15 stars). Figure 4 also shows that the industrial change ranking is led by Walloon Brabant: on a scale of 0 to 1, this NUTS 2 region has a score of 0.751.

Mapping the pilot regions' industrial change and cluster stars reveals three different types of region: (1) high number of cluster stars, but moderate composite index of industrial change (below 0.5) (Piemonte, Nord-Pas-de-Calais, Picardie, Centre-Val de Loire, Lithuania), (2) regions with moderate figures for both indicators (below 35 cluster stars and composite indexes of industrial change below 0.6) (Hainaut, Liège, Slovenia, Dresden, Namur, East & North Finland, Leipzig, Luxembourg, North Middle Sweden, Cantabria, Chemnitz), and (3) Walloon Brabant (composite index of 0.75 and xxx cluster stars. In the second group, Hainaut, Liège and Slovenia stand out from the other regions due to the higher numbers of cluster stars. In part, this is also the case for Chemnitz, but it has a lower index for industrial change.

Figure 4: Composite indicator industrial change (total index) and cluster stars (total) for pilot regions



Source: EOCIC, based on various data sources and own calculations

2. Key challenges, barriers, and drivers of industrial modernisation in Lithuania

This chapter summarises, in tabular form, the political, economic, socio-cultural and technological framework conditions in Lithuania that were outlined in detail in the assessment report. The chapter then presents the key strengths, weaknesses, opportunities and threats that need to be considered in the development of the regional policy framework in Chapter 3.

Figure 5 summarises the key **political, economic, socio-cultural and technological (PEST) features, conditions and challenges for Lithuania**, as identified and detailed in the assessment report. The country's economy has undergone a fundamental transition in the last 25 years. GDP growth and unemployment are in line with the EU average. Mainly due to emigration, Lithuania's population has been shrinking since the country's independence, making productivity increases the crucial condition for economic growth in the future. Lithuania has developed several support schemes for clusters.

Figure 5: The regional ecosystem and framework conditions of Lithuania (PEST analysis)

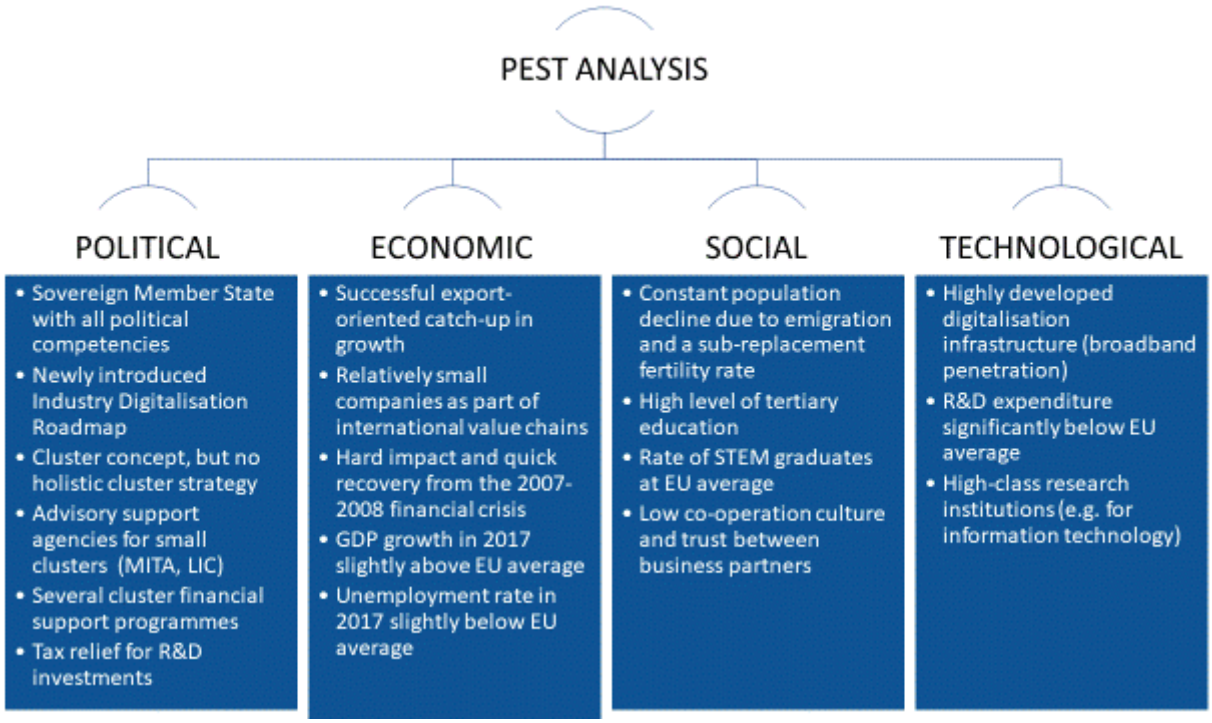


Table 1 details the **strengths, weaknesses, opportunities and threats of industrial transition in Lithuania**. The country's strengths lie in the region's strong industrial sectors (e.g. food processing, furniture, energy), as well as in its excellent digitalisation infrastructure. Skill shortages, which are a major threat to Lithuania's industrial transition, are directly related to the population decline presented in the PEST analysis above.

Table 1: Strengths, weaknesses, opportunities and threats (SWOT) of industrial transition in Lithuania

Strengths	Opportunities
• Strong industrial base (20% of GDP and 80% of exports are generated by industry) • Major industry sectors: food processing, materials, energy, machinery, ICT, furniture • Cluster landscape covers the key sectors • Excellent digitalisation infrastructure • Flexible businesses adapting quickly to changes in world markets	• Moving up the value chain • Further internationalisation/integration into global value chains • Involving more research institutions in co-operation and cluster activities • High number of cluster organisations with existing trust relationships with their companies • High affinity with "Industry 4.0"
Weaknesses	**Threats**
• Dominance of low and medium-tech industries and contract manufacturing • Not enough cross-sectoral co-operation • Lack of long-term strategy for financing cluster activities • Small scale of cluster organisations (on average 13 members and mostly SMEs) • Lack of cluster management capacities (skills, financing)	• Skill shortages due to emigration and ageing population • Productivity growth not strong enough to keep up with economic growth • Lack of trust among businesses hindering co-operation • Understanding of cluster organisations as a loose set of activities with low commitment

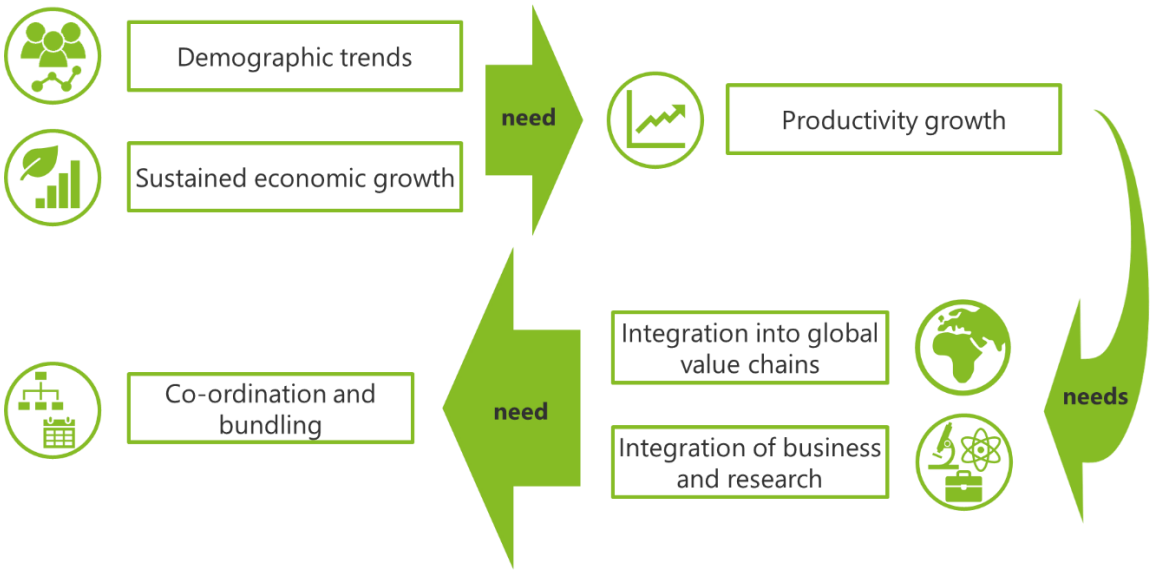
The above SWOT and PEST analyses have led to the formulation of several main challenges that need to be addressed. Seeing that Lithuanian companies are on average small and do not lead the value chains in question, co-operation between companies is needed to bring Lithuanian companies into global value chains and into the positions in the value chains that can provide the value added and productivity for future growth.

Cluster policy can make an important contribution to achieving the needed change in co-operation, productivity and industrial transition. The strategy sketched out below and the suggested measures aim to foster that closer co-operation.

3. Proposed regional strategy to address the challenges

As the EOCIC assessment report shows, Lithuania's industry is characterised by steady economic growth challenged by a negative demographic trend. It is crucial for businesses to be able to increase productivity even faster than already achieved to offset demographic developments and maintain sustainable growth. Clusters are drivers behind innovation, development and modernisation processes and thus play a major role in the modernisation of Lithuania's industry. Therefore, the regional value chain networks must be sustainable and effective in fostering cooperation and co-ordinating within and beyond their clusters (Figure 6).

Figure 6: Challenges and needs of industry modernisation in Lithuania



Source: EOCIC

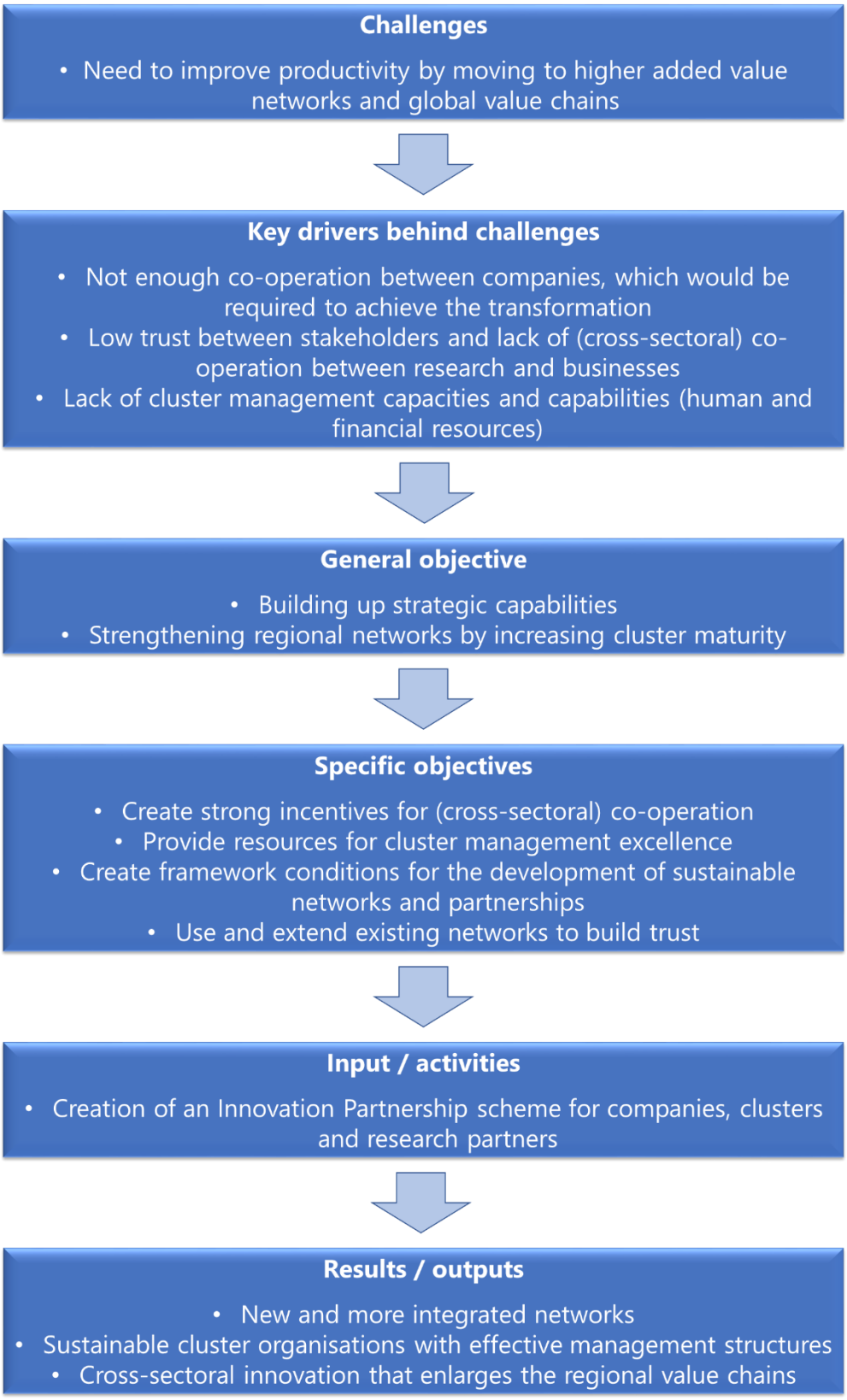
The assessment report and the subsequent policy review meeting identified several key drivers behind these challenges. Many cluster organisations in Lithuania have not reached the necessary level of maturity yet; cluster managers struggle with a lack of human and financial resources; overall commitment of businesses to cluster networks is low due to a lack of trust in each other and in the cluster organisations.

The measures suggested in this policy briefing need to be integrated into the existing industrial policies and strategies currently being developed in Lithuania. The government's newly introduced Industry Digitalisation Roadmap sets out how the existing strengths in the ICT sector can be further developed and better connected to other sectors in Lithuania in order to boost innovation, increase knowhow and develop new technologies and solutions. At the same time, the Directorate-General for Regional and Urban Policy supports the development of a Circular Economy Strategy aiming to foster industrial modernisation in resource-intensive industries in Lithuania.

As a result, the **general objective is to build up strategic capabilities and strengthen regional networks by increasing cluster maturity and cross-sectoral co-operation**. This is to enable the business environment and entrepreneurial basis in Lithuania to speed up the industrial transition and

improve the global competitiveness of regional industrial value chains. Figure 7 below maps these elements against the main challenges identified in the previous section:

Figure 7: Overview of the strategic background for industrial modernisation in Lithuania



Source: EOCIC

With clusters having been identified as key actors and facilitators for the implementation of modernisation and digitalisation objectives, they become the main addressee of the measure suggested in this briefing. The following elements need to be taken into account as specific objectives to overcome the challenges:

1. Creating strong incentives for (cross-sectoral) co-operation;
2. Providing resources for cluster management excellence;
3. Creating framework conditions for the development of sustainable networks and partnerships;
4. Using existing cluster structures to maintain and foster trust between stakeholders.

A potential option for addressing these challenges is outlined in the next chapter: a funding scheme focusing on cross-cluster innovation and expansion of existing networks, and a so-called Innovation Partnership Competition. The Innovation Partnerships, which complement existing cluster initiatives, are intended to incentivise new co-operation ventures, and to lead to the development of innovative products and services that will enable Lithuanian businesses to develop new markets, and move up and integrate their value chains.

4. Specific recommendations for policy intervention: Competition to create "Innovation Partnerships"

4.1. Description

One of the most important aims of the strategy outlined above is to enable the cluster initiatives in Lithuania to foster and shape the industrial transition of the key sectors of the Lithuanian economy. Improving labour productivity and the resource efficiency of the economy will require different sectors and institutions to co-ordinate their efforts. Clusters need the capacities and the capabilities to identify and take advantage of the resulting opportunities.

The outline is similar to a concept that has been implemented in Saxony (Germany) under the name Innovation Clusters[4]. Although the cluster landscape in Saxony is in many respects different from the situation in Lithuania, there are nevertheless certain similarities between the challenges faced by these two regions. One of the main objectives of the Saxon Innovation Clusters is to increase collaboration between clusters and stakeholders from science and research to develop new technological solutions. The competition for funding organised in Saxony sought up to five Innovation Clusters that have demanding concepts for the future to develop new solutions for the 'tasks and needs of tomorrow'.

These Innovation Clusters are not existing cluster organisations but must be newly created partnerships between existing stakeholders and stakeholder groups. Some (but not all) of the partners can be and are existing cluster organisations, meaning that the expertise of those clusters and the trust these organisations have built with their companies is also utilised. The Innovation Clusters aim to expand those existing networks. The winners receive funding of up to EUR 5 million each that they can use over a period of up to 10 years. Participating consortia are required to concentrate on the fields of interest outlined in Saxony's innovation strategy: environment and resources, energy, raw materials, mobility, health and nutrition, and digital communication. The four Innovation Clusters that have already been awarded focus on sensors, alternative power trains (hydrogen/fuel cells), smart railway infrastructure and digital medical technology.

Some features of this approach could be used in Lithuania, but would need to be tailored and extended to be suitable for Lithuanian circumstances. A very strong focus would need to be put on capacity and capacity-building as well as on trust-building within the existing cluster organisations to make them fit for the strategic co-ordination tasks needed for industrial modernisation.

Objectives of the Innovation Partnerships

This Innovation Partnership Competition would have four major objectives:

1. To boost innovation and activate potential in areas where Lithuania's economy needs to modernise:
2. To improve and integrate collaboration among business and research stakeholders across sectors;

[4] Call for proposals on Innovation clusters, Sächsische Aufbaubank. Available at: https://www.sab.sachsen.de/förderprogramme/sie-möchten-ein-unternehmen-gründen-oder-in-ihr-unternehmen-investieren/clusterförderung.jsp?cookieMSG=allowed

3. To help to build up the strategic capabilities of cluster organisations and other stakeholders;
4. To use existing structures and their trust relationships to help to build new partnerships.

The first and second objectives are addressed by the scope of the competition (the relevant economic sectors or technological applications selected) and by the targeted networking between the partners to attain the Partnership's specific goals. The third and fourth objectives are addressed by the design of the competition requirements that participating consortia need to fulfil. The results of the EOCIC assessment report have shown that trust among business stakeholders in Lithuania is a major obstacle for cluster development. This is aggravated by a lack of cluster management resources and a corresponding lack of strategic vision on the part of cluster initiatives. These factors have to be taken into account in the Innovation Partnership Competition award requirements. The design of the competition should encourage the members of the participating consortia to intensify and integrate their collaboration. Figure 8 and Figure 9 present two illustrative examples of potential Innovation Partnerships in Lithuania:

Figure 8: Example of a potential Innovation Partnership for the food processing industry and the circular economy

ILLUSTRATIVE INNOVATION PARTNERSHIP I:

THE FOOD PROCESSING INDUSTRY AND THE CIRCULAR ECONOMY

Strategic goals

The food processing industry is one of the largest contributors to Lithuania's GDP. This industry provides many lower productivity jobs and at the same time is an important user of Lithuania's natural resources. Therefore, the food processing industry might be a good example for implementation of the upcoming Circular Economy Strategy. An Innovation Partnership in the food processing industry with a focus on circular economy goals could therefore contribute to the generation of higher productivity and the reduction in fewer resource-intensive jobs that are needed for a sustainable and inclusive economy. Innovation can in many ways contribute to that higher resource and labour productivity by helping to avoid food waste or by using existing food residuals in higher value processes (e.g. bio-economy). Most of these innovations require cross-sectoral approaches and could be supported by cluster management and the suggested Innovation Partnerships.

Who?

Potential partners that could collaborate in the food processing Innovation Partnership are those in agribusiness sectors, farmers, and all relevant waste collection and waste treatment industries, as well as related research institutions. Such a partnership could work both on strengthening the position of Lithuanian food products in global value chains, and on developing methods and business models that reduce food and agricultural waste, or make higher value use of it. Research can bring great value to such processes either by developing technologies for higher-value uses of food and agricultural waste or by developing better logistical models for the value chain.

Figure 9: Example of a potential Innovation Partnership for the digitalisation of manufacturing

ILLUSTRATIVE INNOVATION PARTNERSHIP II:

DIGITALISATION OF INDUSTRY – MANUFACTURING

Strategic goals

Lithuania's regional economic strengths include on the one hand its digitalisation infrastructure and ICT sector and on the other a strong manufacturing sector, which requires ever more advanced ICT both in the production processes and in the final products. For that reason, the manufacturing industry is an important focus of Lithuania's Industry Digitalisation Roadmap. An Innovation

Partnership in this domain could focus on supporting the adaptation of advanced IT solutions by Lithuanian SMEs in the manufacturing industry (including Industry 3.0 adaptations where companies are not yet prepared to move directly to Industry 4.0 applications). This could help to improve Lithuanian companies' productivity and strengthen the share of value added generated in Lithuania.

Who?

The Innovation Partnerships would include the existing strong digital industry clusters and link them with manufacturing clusters. Additionally, research institutions in the areas of robotics, automation and/or AI could and should be brought on board. An example for a potentially valuable partner for industry digitalisation is the Lithuanian Engineering Industries Association (LINPRA)[5].

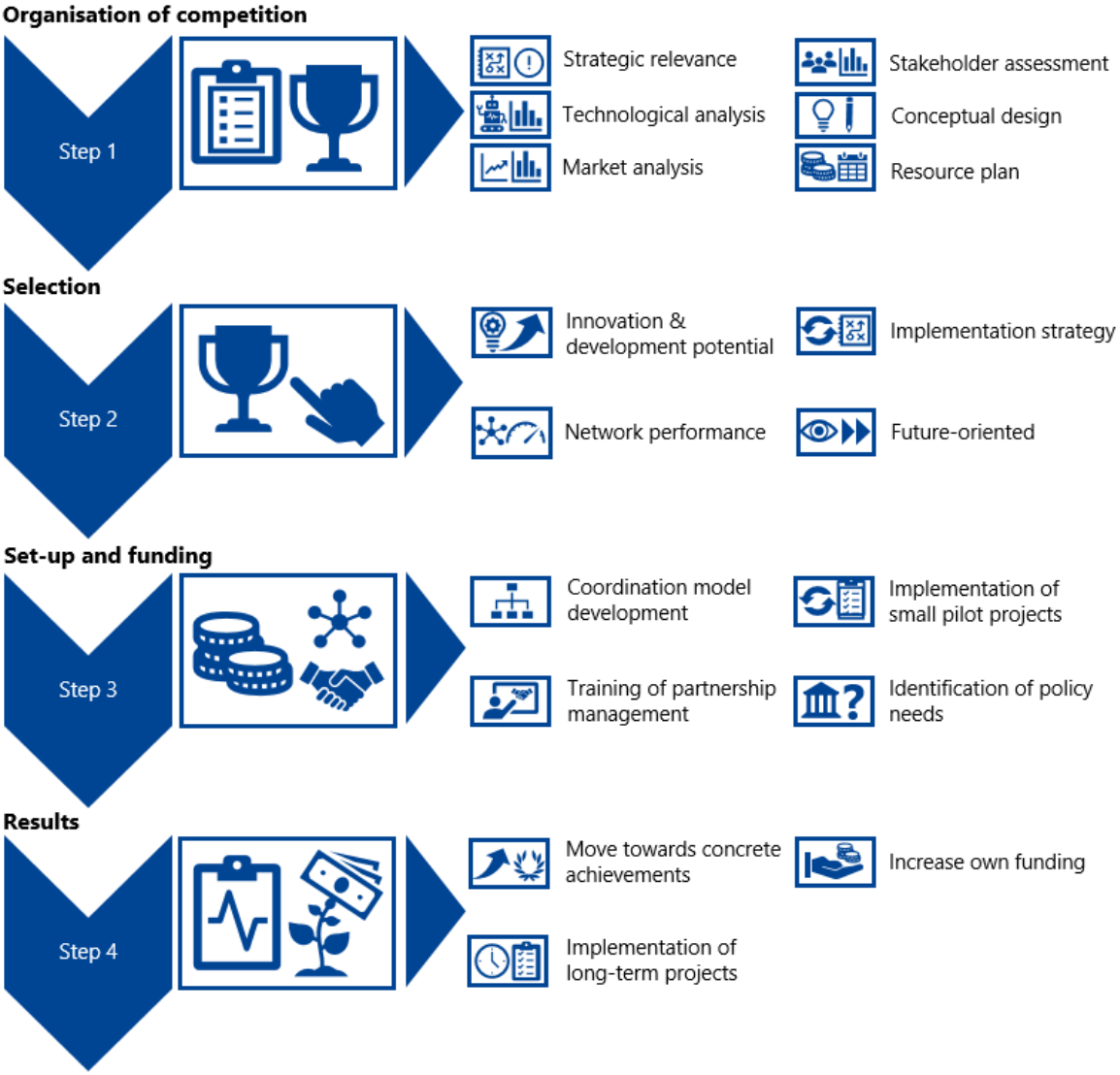
There would be four steps in the Innovation Partnership Competition.

1. **Step 1:** Organisation of competition
2. **Step 2:** Selection
3. **Step 3:** Set-up and funding
4. **Step 4:** Results.

The Lithuanian Ministry of the Economy and Innovation[6] will need to organise a competition to identify applicants, to select the Innovation Partnerships to be awarded, to support the development of the strategy and the network building, and to support the consolidation of the Innovation Partnerships and the development of concrete outputs. During the last two steps, the government will need to oversee and monitor the execution of the strategy and implementation activities. The four steps for the implementation of the Innovation Partnership Competition are outlined in Figure 10Figure 10 below:

[5] https://linpra.lt/en/about-us/linpra-europoje/
[6] http://eimin.lrv.lt/en/

Figure 10: The four steps in the Innovation Partnership Competition



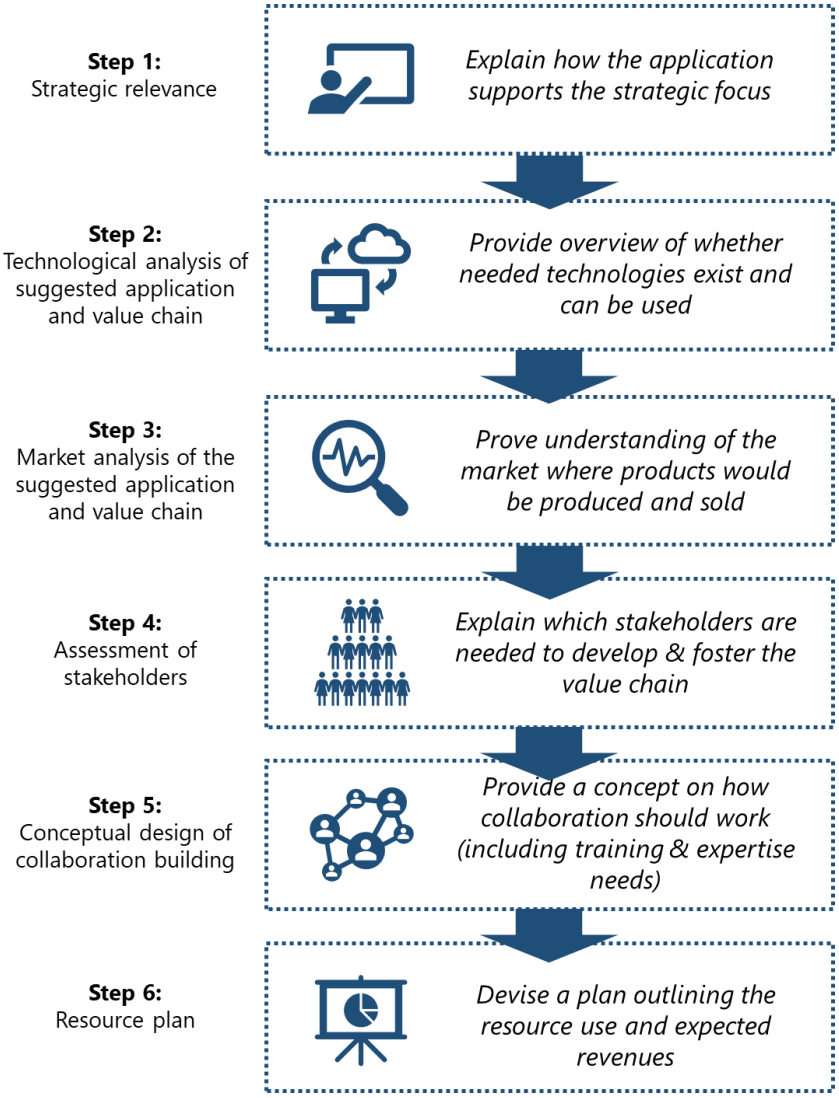
Source: EOCIC

Step 1: Innovation Partnership Competition

The first task will be the development of a competition where groups of organisations can bid to become one of the identified Innovation Partnerships. The tender documents would not choose concrete value chains but would describe certain fields of activity. For example, Industry 4.0 and circular economy are two thematic axes that came up repeatedly during the EOCIC assessment phase and which could thus also be the basis for the Innovation Partnership Competition.

The Innovation Partnerships describe in their bid which technical application they would develop and use to build an added value chain that could provide the high productivity jobs and the increased resource efficiency that Lithuania needs. The applicants' main rationale in the definition of their application and value chain should be market-driven. The Innovation Partnerships need to prove in their bid that they have all the applied research and industrial capabilities, and capacities in their team, and that they have an understanding of how to develop the collaboration in a way that results in a competitive and productive industrial value chain in Lithuania. Figure 11 shows the requirements that the applicant networks would have to fulfil in a tender for such a competition.

Figure 11: Requirements for the applicant networks



Source: EOCIC

1. **Strategic relevance**: The applicants need to explain how the suggested application or value chain supports the overall strategic focus, for instance how the application will support sustainable high-productivity jobs and/or resource efficiency or other strategic policy objectives.
2. **Technological analysis of suggested application and value chain:** The applicants need to provide an overview of whether the technologies needed for the application already exist (or can be developed) and whether the consortium can use these technologies.
3. **Market analysis of the suggested application and value chain:** The applicants also need to prove their understanding of the markets in which the application would be produced and sold.
4. **Assessment of stakeholders:** On the basis of these analyses, the applicants should explain which stakeholders are needed to develop and foster the value chain and how they want to engage with them. The composition of the Innovation Partnership needs to fulfil certain criteria to create added value beyond existing networks (minimum number and different types of partners; at least one key partner able to attract SMEs and transfer knowledge from and to international value chains, e.g. an international company). The applicants should also explain how they will ensure the development of the Innovation Partnership over time and how they would integrate new partners or stakeholders if and when needed.

5. **Conceptual design of collaboration building:** The applicants will be asked to provide a concept on how the collaboration should work and how they want to develop it. The co-ordination managers' training and expertise needs should be part of that concept. Applicants should also include a concept for trust-building within the Innovation Partnership, such as small starting projects to get to know each other.
6. **Resource plan:** Lastly, the application needs to include a plan that outlines the resource use and the expected revenues (at least for the initial setting-up phase). The plan should also describe the strategic approach to increasing the Innovation Partnership's own financial resources (e.g. from membership fees or EU funds) over the course of the whole funding period, with the aim of reaching a certain degree of self-sustainability.

If there is to be a real competition, the number of awarded Innovation Partnerships should be limited to two to three. Clearly, communicating the competitive element of the scheme will serve as an additional incentive for applicants. The application procedure should be accompanied by a public support mechanism to facilitate the composition of consortia (finding and matching partners) and the development of the application. The support should help applicants understand the individual selection requirements and design high-quality applications. Such support could be provided by the two Lithuanian organisations with experience in cluster support (Science, Innovation and Technology Agency – MITA[7] and Lithuanian Innovation Center – LIC[8]), but also by trade associations that have the capabilities to organise such a partnership.

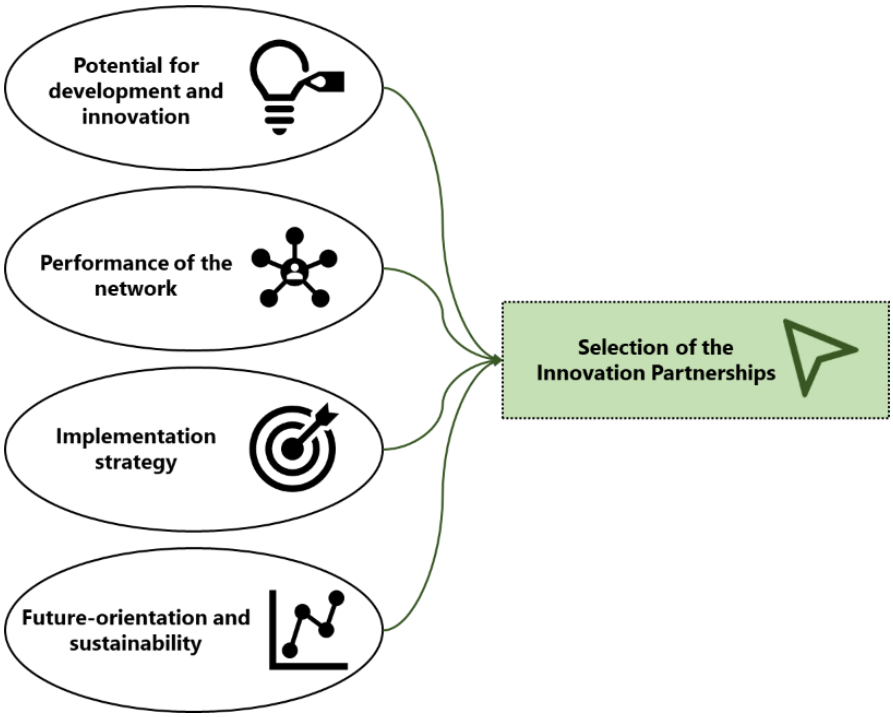
Step 2: Selection of the Innovation Partnerships

After the applications are closed, the Innovation Partnerships to be awarded will be selected by a jury. The composition of the jury should be as diverse as possible. The majority of members should represent industry, but the jury might also include representatives from the Ministry of the Economy and Innovation, representatives from facilitation agencies (MITA, LIC), or academics. Other organisations (e.g. Lithuanian engineering industries association - LINPRA[9], The Information and Communication Technology (ICT) Industry Association - INFOBALT[10], Invest Lithuania[11]) might support the jury in assessing the individual members and/or the international potential of the Innovation Partnerships. It is important to put together a jury that is both competent and unbiased.

[7] https://mita.lrv.lt/en/
[8] http://lic.lt/
[9] https://linpra.lt/
[10] https://infobalt.lt/en/
[11] https://investlithuania.com/

The selection of the Innovation Partnerships should be based on the following criteria:

Figure 12: Criteria for the selection of the Innovation Partnerships



Source: EOCIC

1. **Potential for development and innovation:** Is there a clear technological and market vision? Does the envisaged outcome have market potential? Does it have the potential to integrate the regional value chain?
2. **Performance of the network:** Is the composition of the Innovation Partnership relevant, and does the Partnership attain critical mass? Does it go beyond existing networks, including universities and research institutions? Does it include cross-sector co-operation? Are stakeholders committed?
3. **Implementation strategy:** Does the Innovation Partnership follow a systematic approach and allocate adequate time and other resources to building up strategic capabilities from the beginning? Does the implementation strategy set out realistic actions for the consolidation of the partnership, including first projects for trust building? Has the Innovation Partnership defined clear long-term goals and milestones? Do the suggested activities plausibly support the achievement of these goals?
4. **Future-orientation and sustainability:** Is the Innovation Partnership planning for the future and not the present? Does the Innovation Partnership propose a robust plan to reach a satisfactory degree of self-sustainability? Are relevant megatrends (digitalisation, demography) picked up and taken into account?

The selection procedure includes a consultation phase where the jury may invite applicants to provide additional information on or clarification of their applications. The consultation phase should be conducted as part of the application support mechanism, i.e. with the purpose of helping applicants to submit high-quality applications.

Step 3: Setting up the Innovation Partnerships

The awarded Innovation Partnerships would receive fixed funding for a relatively long period (7-10 years) with certain agreed delivery items. The longer-term funding is needed to allow the build-up of the necessary co-ordination infrastructure and the growth of the Innovation Partnerships. The build-up phase will take about 2-3 years.

An important point in the setup phase of the Innovation Partnerships will be the development of an action plan. The partnerships should work out in the setup phase what actions the different partners need to take and what policy support is needed (e.g. training, regulations, infrastructure). Such an action plan will also be required to integrate the Innovation Partnerships firmly into the existing framework of support programmes (Inoklaster[12], ClusterFY[13], Innovation Vouchers[14], Intelektas[15], etc.).

Choosing the right co-ordination model is crucial for the success of the Innovation Partnerships. On the one hand, the co-ordinator needs to be very close to the value chain processes and research needed for the transition, and on the other, they need a certain degree of independence, as one of their key tasks will be to constantly monitor the composition of the Partnerships and whether new partners or stakeholders should be integrated.

Although the setup phase focuses on establishing the Innovation Partnership, it is nevertheless important to develop and implement smaller pilot projects from early on. These could be joint technology development between businesses and universities or the establishment of new business relations abroad. These pilot projects must be suitable for achieving short-term success and creating immediate benefits for the partners. Such small successful achievements will help to increase trust between partners and convince partners (and potential future partners) to commit further to the Innovation Partnership.

In this initial phase, the monitoring should be open enough to enable the Partnerships to build up strategic capabilities. The milestones should centre on the achievement of organisational goals, such as:

1. Setting up the Innovation Partnership management;
2. Defining the working processes and an action plan between the stakeholders based on the conceptual design outlined in the application;
3. Training the Innovation Partnership management;
4. Identification of policy needs and embedding the Innovation Partnership in the existing support framework.

Step 4: The Innovation Partnerships delivery

After the setup phase, the Innovation Partnerships need to focus their activities on developing and generating outputs that lead to the achievement of the Innovation Partnerships' strategic goals. Such activities include joint research and innovation projects, cluster management training, staff exchanges, marketing, development support to members, or representation of the Innovation Partnership at international level. The activities need to be strictly focused on the objectives of the Partnership, and the Partnership co-ordinator will need to be able to show the link of the activities to those objectives.

In this consolidation phase, the monitoring of the Innovation Partnerships would need to switch more and more to indicators related to the strategic goals, like the economic value of products produced by

[12] https://www.esinvesticijos.lt/lt/finansavimas/patvirtintos_priemones/inoklaster-lt
[13] https://www.interregeurope.eu/clusterfy/
[14] http://eimin.lrv.lt/en/sector-activities/innovation/innovation-support-measures
[15] https://rio.jrc.ec.europa.eu/en/library/intellect-lt

the companies that are members of the Innovation Partnership, labour productivity or resource efficiency.

Another part of the second phase should be the transition of the application-focused Innovation Partnership into an ongoing partnership to enable Lithuanian companies' further innovation success and a sustainable competitive advantage. The gradual reduction in public funding and the simultaneous build-up of their own funding capacities by the Innovation Partnerships (e.g. direct income, access to research funding) will be a key element in this phase.

Conditions for success

Even very effective Innovation Partnership organisations will need to have certain policy conditions in place to be able to support the industrial transition efficiently:

Complementary funding: The funding of Innovation Partnerships will be sufficient to organise the co-ordination processes, but some Partnerships will require research funding or infrastructure funding to be successful. This is especially important in EU Member States like Lithuania, where this type of funding is more difficult to obtain due to a scarcity of public research funding in general. Different models to ensure access to funding can be found in other European regions, but the most realistic model for Lithuania would probably be to grant "priority" status to research applications from Innovation Partnerships if they meet the conditions of the research grant. The same could apply to infrastructure funding when and if needed. Additionally, the clusters could be supported in applications for alternative European funding streams e.g. H2020[16] for Research or ERDF[17] funding for relevant infrastructure.

Complementary cluster support measures: The Innovation Partnership Competition should complement existing cluster support measures. The idea behind the Partnerships is to support a few spearhead initiatives that target future value chains or the applications that are most promising in Lithuania. While existing cluster initiatives can become partners in an Innovation Partnership, the Partnerships will not replace them. This means that the existing cluster initiatives will need continuation of existing support measures to pursue their own ongoing activities. In addition, basic cluster support will still be needed to foster entirely new and embryonic cluster initiatives that develop in emerging sectors.

Investment in cluster capabilities: Moreover, building up strategic and management capabilities, which takes place in the Partnership setup phase, will heavily influence the overall effectiveness of the Partnerships. They should therefore be supported by dedicated training measures for the Innovation Partnership co-ordinators, organised and tailored by the cluster support organisations (MITA, LIC).

4.2. Benefits and Costs

In a successful Innovation Partnership, all relevant research and industry partners will work together, both to identify the business opportunities that innovation can provide and to take advantage of those opportunities. The targeted networking and smart partner matching strongly reinforce the identification and creation of opportunities aligned with the specific value chain/application goals of the Partnership. The targeted orientation of the Partnership, together with the close involvement of research institutions and universities (which is an application requirement), will lead to more demand-driven and tailor-made research and innovation, and consequently to more successful transfer of research into market-ready solutions, products and services. Research stakeholders will therefore benefit from additional funding for research that can be commercialised, while business stakeholders will benefit from the competitive advantage of having innovative products and services. These effects are reinforced by the fact that the

[16] https://ec.europa.eu/programmes/horizon2020/en
[17] https://ec.europa.eu/regional_policy/en/funding/erdf/

Innovation Partnerships will focus on thematic fields of activity that go beyond existing networks and clusters, and therefore tackle challenges that would otherwise not be addressed. This cross-sectoral co-operation will activate additional potential for innovation.

Apart from the closer link to research facilities, the closer links among companies from different sectors will help when it comes to designing new products or improving existing products, or identifying cost savings. Very often, moving up the value chain requires moving to products or product parts with fewer competitors, either by developing a technological advantage or by producing a more complete product or more complex components. The development of both types of competitive advantage will be fostered by the tighter collaboration in the Innovation Partnerships. This can therefore be an important step in moving to higher productivity positions in the value chains.

Innovation Partnership management will benefit from a strong focus on building up strategic capabilities and resources for management activities. The soundness of the applicants' management-building strategy will be a major selection criterion in the competition, and take a significant share of the funding in the initial phase of setting up the partnerships. Eventually, the Innovation Partnership management and the managements of the individual partners will have the necessary organisational, technical and financial capabilities, and resources to co-ordinate the activities that are required for the Innovation Partnerships and their members to be innovative and competitive at international level, including the development and implementation of new products, new production processes and new business models.

Another important benefit of the Innovation Partnerships is that they will use existing trust structures by including existing cluster organisations as partners. The projects they carry out will help to build trust between the Partnership members (e.g. the cluster initiatives involved), but also between the companies that are part of those cluster initiatives as they will see that conditions are progressing. Since stakeholders in Lithuania pointed out that sometimes trust is missing between companies and cluster organisations, such an overarching co-ordinating facility does not have to start from scratch and can improve trust among the partners step-by-step.

In terms of costs, as indicated above, it is important that the Innovation Partnerships offer a strong incentive for stakeholders to commit. To build up these stable partnerships, the funding needs to be long-term and transparent. In the Saxony example, each of the Innovation Clusters chosen (maximum 5) receive maximum funding of EUR 5 million for up to 10 years depending on achieving operational targets over the period. The precise funding needs for a partnership depend on the number of organisations involved and the size of the co-ordination activity needed.

In the first phase of setting up the Partnerships (2-3 years), the majority of funding would come from grants to support the development of strategic capabilities and the establishment of the necessary organisational infrastructure. In the second phase of consolidating the Partnerships (5-7 years), the funding model should gradually shift to using more own resources (such as membership and service fees) in accordance with the Innovation Partnerships' business plans included in their applications. The overall self-funding ability will be strengthened over time when successful projects and developments enable the Innovation Partnership to show its value to the partners. However the small size of the Lithuanian clusters and companies will always set some limits to the self-funding of those activities, meaning that a certain share of the Innovation Partnerships' funding will always have to come from public support. The Innovation Partnerships need to be understood as a policy tool for regional development and industrial change that require long-term commitment from the participants, but also long-term support from the public authorities.

4.3. Risks, obstacles and challenges

In terms of risks, obstacles and challenges for the implementation of the Innovation Partnerships, certain elements are worth highlighting.

The lack of trust between stakeholders and the overall low commitment to co-operation was identified as a major obstacle in the assessment report and was discussed in detail in the policy review meeting. To build up successful co-operation in the Innovation Partnerships, this lack of trust will need to be overcome. In a climate where trust is low, it cannot be expected that the formation of Innovation Partnerships will just happen without further support or that the Innovation Partnerships will not need nurturing and support in the starting phase. Therefore, the experience of the two organisations that are currently supporting and guiding clusters (MITA and LIC) is crucial in organising a matching process and in supporting the organisation and co-operation in the starting phase of the Innovation Partnerships.

Due to the size of the country, many value chains are only partly situated in Lithuania and need international research or industry partners. The Innovation Partnerships therefore need to take these international partners into account and find the right niche or position in the value chain for their Partnership. Finding the opportunities where enough value added will be generated in Lithuania will therefore be a challenge.

The key success factor of the Innovation Partnerships lies in the design of the scheme. First, the requirements for build-up of strategic capabilities and the composition of the network need to be effective in order to mitigate the risks outlined above. Moreover, the design of funding will influence the evolution of the Innovation Partnerships. In the setting-up phase, the funding needs to be open enough to allow the Innovation Partnerships to establish their structures, and to explore and define future activities. In the consolidation phase, the funding will have to target concrete outputs more. Simultaneously, the funding needs to be reduced at the right speed to build up the necessary capacities in the beginning and to ensure that the Innovation Partnerships reach a satisfactory level of self-sustainability towards the end of the funding scheme.

5. Roadmap and action plan with activities, timeframe and actors

To deliver the specific recommendations set out in Chapter 4, the table below summarises the required actions, their timing and the relevant action owner.

Table 2: Action plan

Action	Timing of the action	Owner and content of the action
Decision on focus fields for first Partnerships	Autumn 2019	Ministry of the Economy and Innovation, taking into account the results of the ongoing digitalisation strategy and the outcomes of the high impact action "Circular Economy Strategy"
Announcement of competition and publication of the competition conditions	End of 2019	Ministry of the Economy and Innovation drafts the conditions in co-operation with other ministries or other relevant public bodies like Invest Lithuania. The conditions of the competition are published on the web and introduced at several stakeholder events that are also useful for matchmaking.
Deadline for applications	Early Summer 2020	Ministry of the Economy and Innovation and clusters, research institutions and companies form the Partnerships. A prolonged process of building and developing the Partnerships and the applications will be needed and the Ministry should provide the necessary support (potentially via MITA or LIC) if and where needed.
Award of partnerships	Autumn 2020	Ministry of the Economy and Innovation and other contributing departments should provide a transparent award decision pointing out also to bidders that were not awarded how their bid needs to be improved to be successful next time.
Appointment of co-ordinator	Autumn 2020	Together with the Partnerships, the Ministry of the Economy and Innovation needs to appoint a suitable coordinator organisation.
Starting phase	Autumn 2020 to Autumn 2021	Partnerships (and especially their co-ordinators) will be building up the organisational structure of the Partnerships. The Ministry of the Economy and Innovation will build up the governance and monitoring structure and support the Partnerships to build up the needed contacts with other public authorities.
Delivery phase	From Autumn 2021	The Partnerships will develop and deliver innovation projects to deliver the relevant strategic goals. The Ministry of the Economy and Innovation will be monitoring the process and supporting it on an ad hoc basis.

European Observatory for Clusters and Industrial Change

The European Observatory for Clusters and Industrial Change (#EOCIC) is an initiative of the European Commission's Internal Market, Industry, Entrepreneurship and SMEs Directorate-General. The Observatory provides a single access point for statistical information, analysis and mapping of clusters and cluster policy in Europe, aimed at European, national, regional and local policy-makers, as well as cluster managers and representatives of SME intermediaries.

The aim of the Observatory is to help Europe's regions and countries design better and more evidence-based cluster policies and initiatives that help countries participating in the COSME programme to:

- develop world-class clusters with competitive industrial value chains that cut across sectors;
- support Industrial modernisation;
- foster Entrepreneurship in emerging industries with growth potential;
- improve SMEs' access to clusters and internationalisation activities; and
- enable more strategic inter-regional collaboration and investments in the implementation of smart specialisation strategies.

In order to address these goals, the Observatory provides an Europe-wide comparative cluster mapping with sectoral and cross-sectoral statistical analysis of the geographical concentration of economic activities and performance, made available on the website of the European Cluster Collaboration Platform (ECCP) [18]. The Observatory provides the following services:

- **Bi-annual "European Panorama of Clusters and Industrial Change"** that analyses cluster strengths and development trends across 51 cluster sectors and 10 emerging industries, and investigates the linkages between clusters and industrial change, entrepreneurship, growth, innovation, internationalisation and economic development;
- "**Cluster and Industrial Transformation Trends Report"** which investigates the transformation of clusters, new specialisation patterns and emerging industries;
- **Cluster policy mapping** in European countries and regions as well as in selected non-European countries;
- "**Regional Innovation system Scoreboard for Clusters and Industrial Change"** that identifies and captures favourable framework conditions for industrial change, innovation, entrepreneurship and cluster development;

[18] European Cluster Collaboration Platform, *Official Website*. Available at: https://www.clustercollaboration.eu/.

- **Updated European Service Innovation Scoreboard**[19], that provides scorecards on service innovation for European regions;
- **"European Stress Test for Cluster Policy",** including a self-assessment tool targeted at cross-sectoral collaboration, innovation and entrepreneurships with a view to boosting industrial change;
- **Customised advisory support services** to twelve selected model demonstrator regions, including expert analysis, regional survey and benchmarking report, peer-review meeting, and policy briefings in support of industrial modernisation;
- **Advisory support service to European Strategic Cluster Partnerships**, in order to support networking between the partnerships and to support exchanges of successful practices for cross-regional collaborations and joint innovation investments;
- **Smart Guides** for cluster policy monitoring and evaluation, and for entrepreneurship support through clusters that provide guidance for policy-makers; and
- **Brings together Europe's cluster policy-makers and stakeholders** at four European Cluster Policy Forum events, European Cluster Days, and at the European Cluster Conference in 2019 in order to facilitate high-level cluster policy dialogues, exchanges with experts and mutual cluster policy learning. Two European Cluster Policy Forums took place in February and April 2018, and the European Cluster Conference is scheduled for 14 to 16 May 2019 in Bucharest (Romania).
- Online presentations and publications, discussion papers, newsletters, videos and further promotional material accompany and support information exchanges and policy learning on cluster development, cluster policies and industrial change.

More information about the European Observatory for Clusters and Industrial Change is available at: https://www.clustercollaboration.eu/eu-initiatives/european-cluster-observatory.

[19] Previous versions for 2014 and 2015 were developed by the European Service Innovation Centre (ESIC), see http://ec.europa.eu/growth/tools-databases/esic/index_en.htm.

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