



SUNRISE VALLEY
SCIENCE AND TECHNOLOGY PARK

EcoRIS3

Policies & Measures to Support Local & Regional Innovation Ecosystems

Analysis of the impacts of Covid-19

Sunrise Valley Science and Technology Park Lithuania



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Foreword

This study was prepared in February 2022 for project *ecoRIS3*, under research and innovation topic of Interreg Europe programme. Project *ecoRIS3*, started at 1 Jan 2017 and running up to 31 Dec 2021, aims to improve and connect regional challenges and opportunities of research and innovation strategies for Smart specialization to local innovation policies and stakeholders, highlighting the role of the “territory” as the place where interlinkages happen and knowledge flows.

Aim of the study is to briefly discuss impacts of the Covid-19 pandemic on key sectors and stakeholders of the Lithuanian innovation ecosystem. Study relies on desk analysis of available studies, especially on Impact evaluation of Smart specialization, prepared in 2021 by Strata (Government strategic analysis centre) and Ministry of Economy Innovation as well as on analysis of Lithuanian Operational programme and supporting documents. SWOT analysis was updated, based on analysed information and on the inputs by the experts.

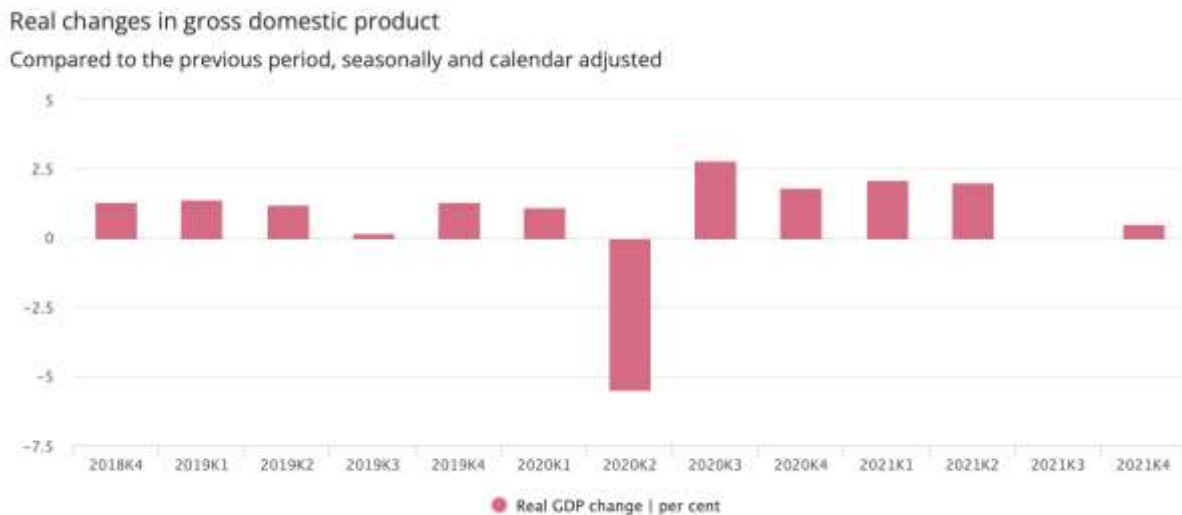
First part of the study presents the general overview of Lithuanian economy in context of Covid-19 pandemic, focuses on key sectors of innovation by presenting selected indicators attributable to economic sectors to Lithuanian Smart specialization. Second part analyses relevant measures of intervention for innovation sector, by discussing the implementation, new measures, change in beneficiaries and change of funding. Study concludes with updated (from 2019) SWOT analysis.

Table 1. Policy instrument addressed

The Action Plan aimed to impact:	<input checked="" type="checkbox"/> - <u>Investment for Growth and Jobs programme</u> <input type="checkbox"/> - European Territorial Cooperation programme <input type="checkbox"/> - Other regional development policy instrument
Name of the Policy Instrument Affected:	Lithuanian Operational Programme (OP) for EU Structural Funds Investments for 2014-2020.
Managing Authority:	Ministry of Economics and Innovation.
Period of implementation	<u>Already implemented:</u> 01/01/2017 till 31/12/2021. <u>Still to be implemented:</u> 01/01/2022 till 31/12/2022.

1 Impacts of the pandemic

The Covid-19 pandemic had rather limited effect on the Lithuanian economy. Real change in GDP was one of the lowest in EU countries and the rebound was immediate (Picture 1). However, the planned recovery of 5% annually was lower than expected due to reoccurring pandemic waves, which resulted in yet more temporary economic restrictions.



Picture 1. Real changes in gross domestic product. Bank of Lithuania, 2022

In 2020, Lithuanian GDP was only 0.9% lower than in 2019. The immediate economic recovery was induced by public sector support measures, limited effects of the first Covid-19 wave, successful performance of exporters and relatively low economic dependence on the most limited and affected economic activities - accommodation and food service, arts, entertainment, and recreation¹. The economic development scenario suggests that the Lithuanian economy would grow by 4.1 % in 2021. GDP growth is forecast at 4.4 % in 2022 and 3.5 % in 2023-2024².

Successful expansion in foreign markets, optimized inventories and reduced investments had a significant impact on the well performance of companies. During 2020, Lithuanian exporters were able to double their share of markets in the main trading territories, compared to a 2015-2019 period. Rapid growth happened mainly due to Lithuania's specialization in the production of goods and services that were less affected by the Covid-19 pandemic or whose demand even increased during this period. A significant part of goods was sold, and services were provided from existing inventories, thus improving the performance of companies in the short term. For example – food, chemicals industry, wood and furniture were manufacturing industries that performed relatively better than most other industries

¹ Review of Lithuanian economy, 2021. Bank of Lithuania

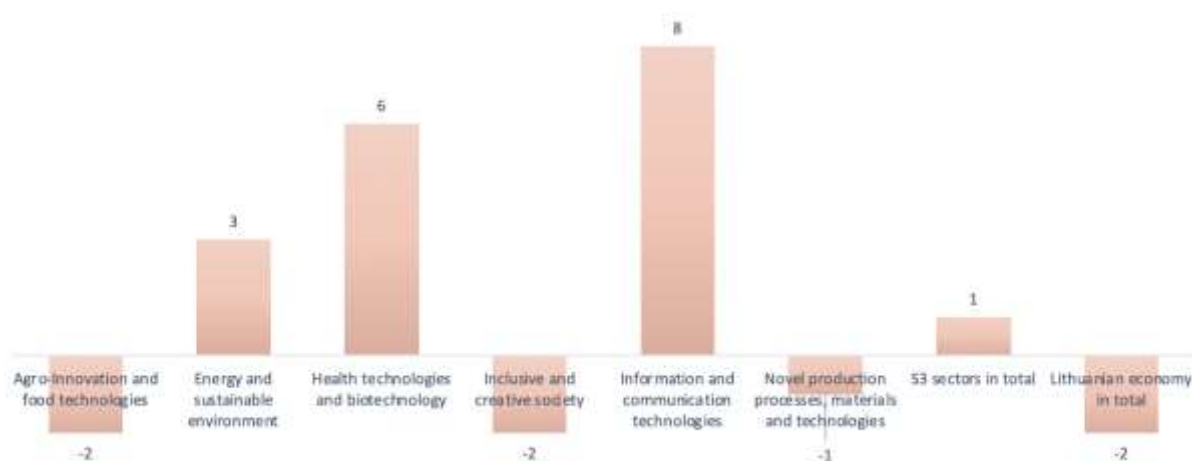
² Ministry of Finance, 2022

both in Lithuania and throughout the EU. In Lithuania these sectors of industry create more than half of value added in manufacturing.

Key innovative economic sectors in Lithuania are directly attributable to activities within six thematic priorities of Smart specialization (S3). Strata has developed concordance matrices of S3 priorities with NACE sectors were developed for monitoring and evaluation purposes as well as for comparability with other sectors of Lithuanian economy³. The Covid-19 pandemic did not substantially hinder the development of these sectors, companies are not only growing rapidly, but they are also becoming more innovative. S3 sectors stayed strong with productivity and competitiveness, while employment and investment indicators were uneven⁴. During 2019-2020 the value added and share of S3 sectors in Lithuanian economy was growing (trend for 4 consecutive years) and Covid-19 pandemic did not slow down the trend.

In 2020 the level of material investments (share in the turnover of enterprises) accounted for 5.7% for the whole economy and 5.5% for S3 sectors and was lowest in 7 years. Covid-19 pandemic might have influenced private sector's willingness to invest, mainly due to uncertainties in demand. The only exception are sectors attributable to *Health technologies and biotechnologies priority* where investments jumped more than 5 times.

At national level, employment in private sector fell for 2%, comparing 2019 and 2020, while employment in S3 sectors altogether managed to grow by 1%. S3 sectors that had increased demand during the pandemic - *Health technologies and biotechnologies priority* and *Information and communication technologies* – grew 6% and 8% accordingly (Picture 2).



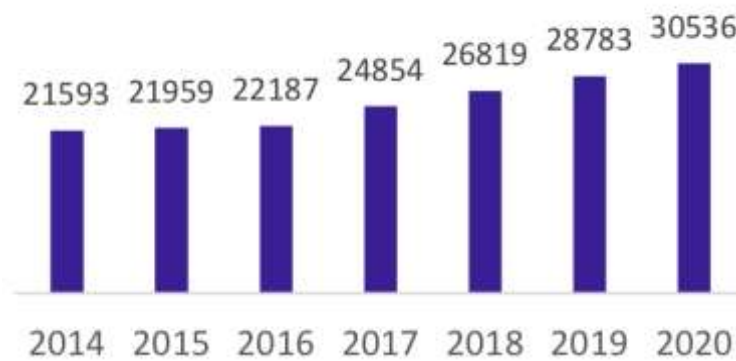
Picture 2. Change in private sector employment by sectors of S3 in %, 2019-2020. Strata, 2021

³ More on Lithuanian S3: <https://strata.gov.lt/en/component/content/article/26-smart-specialisation/63-reports-and-analyses>

⁴ Impact evaluation of Smart specialization, 2021. Strata and Ministry of Economy and Innovation.

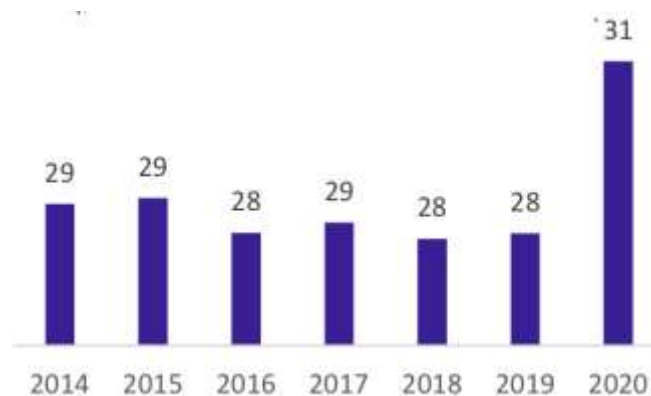
It's rather evident, that key economic sectors of Lithuanian innovation ecosystem did not decline during the pandemic, on the opposite, they showed modest to moderate growth. The most pandemic boosted sectors worldwide were ICT – due to increased digital habits of working, shopping, and spending free time online, and healthcare, that received the most pressure to deal with the consequences of the pandemic, but on the other had this sector received a lot of attention and investments. The Lithuanian ecosystem is no different to these global trends, as two abovementioned S3 sectors has strongly increased the number of employees in private sector.

The turnover of S3 sectors was growing and reached over 30 billion EUR in 2020, the highest number during the implementation of Smart specialization strategy.



Picture 3. Turnover of S3 sectors in M EUR. Strata, 2021

The largest share of turnover was generated by *Novel production processes, materials and technologies* S3 priority – 35.3 % of total S3 sectors turnover and the share of the sector is growing. During the Covid-19 pandemic, Lithuanian industry recovered extremely quickly due to the recovery in external consumption.



Picture 4. Share of S3 sectors turnover in Lithuanian economy, %. Strata, 2021

In 2020 the share of S3 sectors in Lithuanian economy reached record-high third of the whole economy. The innovative sectors of Lithuanian economy has significantly increased their presence in the economy during Covid-19 economic turbulence.

2 Relevant measures

Operational Programme for EU Structural Funds Investments for 2014-2020 (OP) aimed at helping Lithuania's economic development as well as tackling social exclusion, unemployment, and vital issues like energy security. It reflects the goals with a clear emphasis on boosting research and innovation, SME competitiveness, the shift to a low-carbon economy, the promotion of human capital, especially of young people, and the fight against poverty. To achieve the project goals, it is relevant to examine OP **Thematic objective 1** which provides for strengthening the synergy among business, studies and research and exploiting them for the development of the national economic competitiveness based on the smart specialisation strategy. **Thematic objective 3 is focused** on improving conditions for business start-ups and their further development, reinforcing international competitiveness. In addition to different regulatory and fiscal measures which significantly affect business conditions, an important role is played by business support and innovation promotion system. In the wake of the Covid-19 pandemic crisis, the European Commission has proposed a new React-EU initiative to complement the current Cohesion Policy Funds (European Regional Development Fund and European Social Fund). The investments are designed to address the challenges posed by the COVID-19 pandemic crisis, to address the socio-economic difficulties, to ensure strong economic growth and to strengthen its preparedness to withstand future shocks. A new **Thematic objective 13** has been developed for this purpose.

Relevant measures of the OP **Thematic objective 1**:

- Inostart (original name – Inostartas, number – 01.2.1-MITA-T-852);
- Innovation vouchers (Inovaciniai čekiai, 01.2.1-MITA-K-824);
- Innovouchers (Inočekiai, 01.2.1-MITA-T-851);
- Intellect. Joint science-business projects (Intelektas. Bendri mokslo-verslo projektai, 01.2.1-LVPA-K-828);
 - Intellect LT-2 (Intelektas LT-2, 01.2.1-LVPA-K-855);
 - Experiment (Eksperimentas, 01.2.1-LVPA-K-856);
 - Promoting the commercialization and internationalization of R&D results (MTEP rezultatų komercinimo ir tarptautiškumo skatinimas, 01.2.2-MITA-K-702);
 - Promoting centers of excellence and innovation and technology transfer centers (Kompetencijos centrų ir inovacijų ir technologijų perdavimo centrų veiklos skatinimas, 01.2.2-CPVA-K-703).

Relevant measure of the OP **Thematic objective 3** – Industrial digitalization (Pramonės skaitmeninimas, 03.3.1-LVPA-K-854).

The new measures under Thematic Objective 13 will be introduced later in the context of the system's response to the COVID-19 crisis. Prior to this, the implementation of previously planned measures will be discussed.

2.1 Implementation of measures

Inostart. The measure administered by Ministry of Economy and Innovation (MoEI) is implemented by Agency for Science, Innovation and Technology (MITA). Budget of the measure – 8.4 M EUR. 599 applications were received, of which 279 were selected for funding. Currently, 148 projects worth 5.14 M EUR have been completed. Allocated funding for them is 4.34 M EUR. 123 projects with a value of 5.14 M EUR are still being implemented. The funding allocated for them is 3.78 M EUR.

Innovation vouchers. The measure administered by MoEI is implemented by MITA. Budget of the measure – 1.01 M EUR. The measure is already completed. A total of 644 applications were submitted, of which 341 were selected for funding. 284 projects were completed (the remaining ones were terminated, or applications were withdrawn) with a value of 1.35 M EUR. Allocated funding for them is 872 thousand EUR.

InnoVouchers. The measure administered by MoEI is implemented by MITA. This is a measure that has replaced the completed measure „Innovation vouchers“. Budget of the measure – 7.5 M EUR. A total of 585 applications were submitted, of which 350 were selected for funding. Currently, 206 projects worth 7.6 M EUR have been completed. Allocated funding for them is 4.88 M EUR. 114 projects with a value of 3.61 M EUR are still being implemented. The funding allocated for them is 2.35 M EUR.

Intellect. Joint science-business projects. The measure administered by MoEI is implemented by Lithuanian Business Support Agency (LVPA). Budget of the measure – 147 M EUR. 620 applications were received, of which 296 were decided for funding. Currently, 190 projects worth 133 M EUR have been completed. Allocated funding for them is 77.4 M EUR. 78 projects with a value of 120.25 M EUR are still being implemented. The funding allocated for them is 64.59 M EUR.

Intellect LT-2. The measure administered by MoEI is implemented by LVPA. Budget of the measure – 12.46 M EUR. 4 applications were submitted, of which 2 are funded. These two large-scale projects are still ongoing. Their value is 41.27 M EUR and allocated funding is 12.46 M EUR.

Experiment. The measure administered by MoEI is implemented by LVPA. It is an extension of the measure “Intellect. Joint science-business projects“. Budget of the measure – 153.7 M EUR. A total of 329 applications were submitted, of which 223 were selected for funding. No projects have been completed yet. Currently, 212 projects with a value of 235.71 M EUR are being implemented. The funding allocated for them is 142.72 M EUR.

Industrial digitalization. The measure administered by MoEI is implemented by LVPA. Budget of the measure – 91.18 M EUR. A total of 280 applications were submitted, of which 247 were decided for funding. Currently, 65 projects worth 36,95 M EUR have been completed. Allocated funding for them is 14.05 M EUR. 169 projects with a value of 251.13 M EUR are still being implemented. The funding allocated for them is 95.24 M EUR.

There are more measures to promote cooperation between science and business, including those administered by the Ministry of Education, Science and Sport (MoESS). Cooperation between science and business is also indirectly promoted by supporting the strengthening of the knowledge and technology transfer capacities and abilities of research and higher education institutions, improving internal systems, and encouraging the scientific community to create knowledge-intensive businesses.

Promoting the commercialization and internationalization of R&D results. The measure administered by MoESS is implemented by MITA. Budget of the measure – 7.69 M EUR. A total of 162 applications were submitted, of which 86 were selected for funding. Currently, 56 projects worth 6.85 M EUR have been completed. Allocated funding for them is 6.62 M EUR. 30 projects with a value of 5.15 M EUR are still being implemented. The funding allocated for them is 4.73 M EUR.

Promoting centres of excellence and innovation and technology transfer centres. The measure administered by MoESS is implemented by Central Project Management Agency (CPVA). Budget of the measure – 27.04 M EUR. A total of 111 applications were submitted, of which 46 were selected for funding. Currently, 23 projects worth 15.51 M EUR have been completed. Allocated funding for them is 15.29 M EUR. 23 projects with a value of 19.53 M EUR are still being implemented. The funding allocated for them is 19.53 M EUR.

2.2 *New measures*

In response to the Covid-19 pandemic, several new instruments have been developed and even a new 13th thematic objective (priority) of the OP has been developed – “Promoting action to overcome the Covid-19 crisis and preparing for economic recovery”.

Ministry of Economy and Innovation (MoEI) has developed 4 new measures to encourage R&D&I:

COVID-19 R&D (COVID-19 MTEP tyrimai). Implemented by LVPA. Budget of the measure – 30 M EUR. A total of 69 applications were submitted, of which 47 were selected for funding. Currently, 1 project worth 455.35 thousand EUR has been completed. Allocated funding for it is 364.28 thousand EUR. 41 projects with a value of 27.61 M EUR are still being implemented. The funding allocated for them is 23.38 M EUR.

COVID-19 products (COVID-19 produktai). Implemented by LVPA. Budget of the measure – 31 M EUR. A total of 72 applications were submitted, of which 56 were selected for funding. Currently, 44 projects worth 20.6 M EUR have been completed. Allocated funding for them is 18.04 M EUR. 7 projects with a value of 5.55 M EUR are still being implemented. The funding allocated for them is 3.95 M EUR.

Covid-19 creative vouchers (Kūrybiniai čekiai Covid-19). It is a new measure of the OP (Thematic Objective 13) for the development and installation of non-technological innovation. Implemented by LVPA. Budget of the measure – 7.72 M EUR. A total of 897 applications were submitted, of which 124 were selected for funding. No projects have been completed yet. Currently, 123 projects with a value of 8.77 M EUR are being implemented. The funding allocated for them is 6.56 M EUR. Another 492 applications are awaiting a decision by the MoEI to be funded.

Covid-19 e-commerce model (E. komercijos modelis Covid-19). It is a new measure of the OP (Thematic Objective 13) designed to install e-commercial models in companies by reorienting and digitalizing processes. Implemented by LVPA. Budget of the measure – 47.17 M EUR. A total of 1684 applications were submitted, of which 449 were selected for funding. No projects have been completed yet. Currently, 441 projects with a value of 22.86 M EUR are being implemented. The funding allocated for them is 17.04 M EUR. Another 771 applications are awaiting a decision by the MoEI to be funded.

In the face of Covid-19, more emphasis is being placed on the implementation of design solutions and the cultural creative and industrial (CCI) sector, which has been particularly hard hit by the pandemic. These areas are overseen by the Ministry of Culture, which has developed 3 new instruments under the new Thematic Objective 13 of the OP "Promoting action to overcome the Covid-19 crisis and preparing for economic recovery". The measures were formed only at the end of 2021 and the calls were published on 31 December. There are 5 to 40 days left until their completion, so no information is yet available on the applications submitted. These measures:

Incentives to improve the infrastructure of CCI companies (Paskatos gerinti kultūros ir kūrybinių industrijų įmonių infrastruktūrą). Implemented by LVPA. Budget of the measure – 4.16 M EUR. The measure aimed at purchase, development, and installation of infrastructure for the development and provision of new CCI digital and/or circular economy services or products, or the infrastructure designed to promote change in the business processes of CCI companies.

Incentives for the CCI sector to develop competitive cultural products (Paskatos kultūros ir kūrybinių industrijų sektoriui kurti konkurencingus kultūros produktus). Implemented by LVPA. Budget of the measure – 10.55 M EUR. The measure aimed at development and installation of the original design and marketing solutions, digital and E. platforms and other channels for dissemination of CCI products and services. As well as production of advanced, new forms of audio-visual, virtual or augmented reality CCI products, and transforming CCI products, services, or business processes into new forms encouraging digital or circular economy.

Incentives for design developers „Design wings“ (Paskatos dizaino kūrėjams „Dizaino sparnai“). Implemented by LVPA. Budget of the measure – 788.55 thousand EUR. The measure aimed at development and implementation of new design solutions to increase the production of digital and/or circular economy products or services by SME or to implement digital and circular economy-oriented solutions.

2.3 Changes of beneficiaries

The applicants, partners and beneficiaries of the implemented measures have not changed. The measures administered by MoEI can be divided into those aimed at novice innovators (Inostartas, Innovaciniai čekiai, Inočekiai), advanced and mature innovators (Intelektas, Eksperimentas) and mature innovators who invest heavily in R&D (Intelektas LT-2). The new measures of MoEI, which designed to fight Covid-19 and the consequences of the pandemic are targeted at SME, regardless of their level of innovation. Only measure "COVID-19 R&D" is targeted at all enterprises, but participation in such a measure demonstrates the receptivity of enterprises to R&D. No partners are available in any of the new MoEI measures. Again, an exception is the measure "COVID-19 R&D", where partners are available in cases where the project is funded by more than one EU Member State or is implemented in a cross-border collaboration with research organizations or other companies.

The new measures of the Ministry of Culture are also aimed at SME. Applicants for measures in the cultural creative and industrial sectors are, of course, SMEs operating in this field, as well as partners. The applicant of the measure „Incentives for design developers „Design wings“ is the budget institution Lithuanian Culture Council, which organizes a competition of ideas for SME. Partners are not available in this tool.

The measures of the MoESS are mainly focused on the public sector, but in some of their activities the participation of private legal entities as an applicant or partner is also possible:

Measure „Promoting the commercialization and internationalization of R&D results” has 2 different activities. One is for the commercialization of R&D results in spin-offs, so its applicants are research and higher education institutions and the companies set up by them, or companies from which institution benefits. As well as partners. The second activity **intends to finance the implementation of market-oriented science and business R&D projects in line with the international collaborative R&D network of the Member States of the Eureka program. Its applicants are** research and HE institutions **and the partners are also these institutions and private legal entities.**

Measure “Promoting centres of excellence and innovation and technology transfer centres” has 3 different activities. One is to promote high-level R&D centres of excellence to test R&D-based ideas with commercial potential, to create a ready-made or other outcome that can be adapted for market uptake. **Its applicants are** research and HE institutions and university hospitals (there are three such entities in Lithuania with tight relations with universities and quite high R&D potential). The partners are public legal entities operating in the field of science and/or higher education and private legal entities. The second activity is to promote innovation and technology transfer units of research and HE institutions, so its applicants are such institutions. Partners may be public legal entities operating in the field of science and/or higher education. The third activity is dedicated to the implementation of entrepreneurship at research and HE institutions. **Its applicants are** research and HE institutions, and partners may be public legal entities operating in the field of science and/or higher education.

2.4 Changes of funding

Following the Covid-19 pandemic, the European Commission launched a **comprehensive and ambitious recovery plan**. In this regard, cohesion policy will play a key role in ensuring a balanced recovery, fostering convergence, and making sure no one is left behind. The REACT-EU regulation was adopted on 23 December 2020. REACT-EU (Recovery Assistance for Cohesion and the Territories of Europe) will be one of the largest programmes under new instrument Next Generation EU amounting to **EUR 50.6 billion**.

This funding is entirely new: it is a **top up to 2014-2020 programmes and additional funding to the cohesion allocations 2021-2027**.

The programmes under new OP Thematic objective 13 “Actions to overcome the Covid-19 crisis and preparation for economic recovery” are funded by REACT-EU funds. On February 15, 2022 the decision was made to increase the funding for “Covid-19 e-commerce model” from 40 to 47.17 M EUR and from 7 M EUR to 7.72 M EUR for “Covid-19 creative vouchers” measure.

Both ministries MoESS and MoEI channelled additional REACT-EU funding to implement their previous activities as well. MoEI measure “Experiment” is under OP Thematic objective 1 “Promotion of R&I” and under OP Thematic objective 13 dedicated to Covid-19. The budget of measure “Experiment” under OP Thematic objective 1 was reduced from 153.7 M EUR to 72.7 M EUR and given the budget of 76.97 M EUR under OP Thematic objective 13. In this case, OP Thematic objective 1 funds withdrawn from the “Experiment” will be available for other objective’s measures, as OP Thematic objective’s 13

"Experiment" will be funded by additional REACT-EU funding. The same scheme is applicable to measures of MoESS "Promotion of the activities of competence centres and innovation and technology transfer centres" and "Promotion of commercialization and internationalization of R&D results". Therefore, it was chosen not to develop new measures for this purpose, but to re-direct the existing ones focusing on overcoming the consequences of the pandemic. Moreover, the creation of a new instrument requires incomparably more administrative and human effort than the amendment of an existing one.

Around 230 M EUR was allocated to OP Thematic objective 13, but only a part of it relates to R&I. Priority covers development of renewable energy and reduction of energy consumption. The funding planned for the relevant measures currently is 143.38 M EUR:

- Covid-19 R&D – 30 M EUR
- Covid-19 products – 31 M EUR
- Covid-19 creative cheques – 7,72 M EUR
- Covid-19 e-commerce model – 47,17 M EUR
- Promotion of commercialization and internationalization of R&D results – 4,83 M EUR
- Promotion of the activities of competence centres and innovation and technology transfer centres – 7,16 M EUR
 - Incentives to improve the infrastructure of CCI companies – 4,16 M EUR
 - Incentives for the CCI sector to develop competitive cultural products – 10,55 M EUR
 - Incentives for design developers "Design wings" – 0,788 M EUR.

3 Economic recovery and resilience plan "New Generation Lithuania"

The European Economic Recovery and Resilience Facility earmarks the grants of EUR 2.225 billion for Lithuania which will be used for seven pillars, namely green transition, digital transformation, health, social affairs, research and innovation, education, public governance⁵.

To promote the development of an economy based on knowledge and innovation, Lithuania intends to improve the quality of education, strengthen research results, promote innovation and knowledge transfer in the European Union, make more efficient use of information and communication technologies, ensure that innovative ideas are transformed into innovative goods and services, growth, and quality jobs. It is planned that the implementation of the measures will significantly improve the capacity to implement innovations, achieve better results in the field of education, improve the quality and results of educational institutions, and make more efficient use of the economic and social benefits provided by the digital society. It is planned that total of 453,73 M € will be spent on higher education, research and innovation⁶. Three reforms are planned under this component:

1. High quality higher education and strong research and study institutions

⁵ Ministry of Finance, 2022

⁶ Economic recovery and resilience plan "New Generation Lithuania", 2021

2. Effective implementation of innovation policy, higher demand for innovation, development of start-up ecosystems and green innovation
3. Joint research and innovation missions in Smart Specialization

3.1 Impacts of the pandemic on the original SWOT Analysis

Table 2. Update of SWOT Analysis of Lithuanian Innovation System

Strengths <i>(Original strengths that remain accurate)</i>	Weaknesses <i>(Original weaknesses that remain accurate)</i>
<ul style="list-style-type: none"> • FUNDING: Current funding schemes cover a wide spectrum of business needs • PEOPLE: People (especially young) are not afraid to take on new challenges • BUSINESS: Growing attention for development of innovation and investments into R&D, growing number of innovations in manufacture • RESEARCH: Good and improved infrastructure • LINKAGES: Improved environment for cooperation: vibrant entrepreneurial community, small ecosystem with tight links between actors, good examples for cooperation in several sectors (lasers/biotech) 	<ul style="list-style-type: none"> • POLICY: Lack of shared vision, systematic and holistic approach in policy making • POLICY: Sophisticated and defragmented innovation support system (many players, duplicating functions, difficult access to finance, no institutional leadership) • BUSINESS: Small hi-tech sector is not able to generate enough demand for research • BUSINESS: Traditional industry has low absorption capacity for innovation and is not motivated enough to cooperate with research • RESEARCH: General focus of research system is on publications (not on the results suitable for commercialization)
New Strengths derived from the pandemic	New Weaknesses derived from the pandemic
<ul style="list-style-type: none"> • FUNDING: New funding schemes to overcome Covid-19 pandemic consequences • PEOPLE: increased motivation to pursue research careers • PEOPLE: increasing competences in academia and business to access public support for R&I • BUSINESS: increasing competences to develop innovative businesses, better understanding of competitiveness through innovation • RESEARCH: Shift towards more applicable research • LINKAGES: more collaborative culture 	<ul style="list-style-type: none"> • POLICY: Limited capacities for idea development support in business support agencies • POLICY: Insufficient coherence of policy measures • BUSINESS: Still limited willingness to take risk developing innovative ideas • PEOPLE: Lack of high-quality specialists in private and public sector
Opportunities <i>(Original opportunities that remain accurate)</i>	Threats <i>(Original threats that remain accurate)</i>
<ul style="list-style-type: none"> • FUNDING: Available EU funding for business R&D and applied research and growing focus to address “Death Valley” problem • BUSINESS: global pressure and competition is forcing companies to innovate and to invest into R&D • PEOPLE: reform of the education system has already many measures which are addressing the weaknesses of our innovation ecosystem (i.e. informal education, attraction of talents, concentration of resources, career development from early childhood, creation of STEAM centres, etc) 	<ul style="list-style-type: none"> • POLICY: Risk that education reform will fail or will be only partially implemented because lack of implementation capacity and big number of actors focusing only on their own interests • FUNDING: Decreasing level of success and increasing competition in international programmes (i.e., Horizon2020) • PEOPLE: Brain drain failure to adopt to global changes and to switch to global mindset • RESEARCH: Failure to commercialize knowledge (recent years have shown that research and HE institutions are paying more attention and efforts to commercialization of R&D results. State efforts and interventions in this direction also continues)

New Opportunities derived from the pandemic	New Threats derived from the pandemic <i>(original threats that remain accurate)</i>
<ul style="list-style-type: none"> • POLICY: Strong shift towards high-tech development and collaborative projects • POLICY: Establishment of single innovation agency and consolidation of functions • RESEARCH: further upgrade of research infrastructure, increasing linkages of higher education and research (establishment of new university centres) • BUSINESS: Stronger establishment in value chains of Covid-19 related products and services 	<ul style="list-style-type: none"> • FUNDING: high dependency of R&I activities on EU SF support • POLICY: Risk that research support structure will remain fragmented or will become weaker (due to innovation reform) • POLICY: Elimination of Lithuanian businesses from global value chains due to conflict with China

4 Impact and deviation on the original Action Plan

Our Action plan has the goal and primary action of “Increase cooperation in business and science” as this gives allow motivation of universities or any research institutes and business companies to better engage into implementation of the new policy instruments. This also can facilitate new funding opportunities (for DIH, for engaged universities/research institutions and companies) and have impact on improvement of governance of the policy instrument (by providing feedback on the piloted cooperation models to the Ministry of Economy and Innovation (MoEI) and Ministry of Education, Science and Sport (MoESS).

Action of “Increase in business and science/education cooperation”		
Sub-action 1	Map local ecosystem of stakeholders willing to cooperate.	Implemented. We have created the roadmap of Vilnius innovation ecosystem.
Sub-action 2	Divide stakeholders to groups , according to their maturity levels for cooperation: <i>mature stakeholders, immature, other stakeholders.</i>	Implemented. We have identified 8 mature stakeholders, 23 immature stakeholders, and 11 others.
Sub-action 3	Mature stakeholders: a) Select pilot cases suitable for cooperative research projects or some common initiatives in the field of education (i.e. <i>digitalisation</i>), b) Assist in implementation of the pilot, monitor the activities and disseminate the final results.	Implemented. We have assisted 8 SMEs to implement DIH services for other companies in the areas of robotics, cyber security, electronics engineering, artificial intelligence, smart software solutions etc.
Sub-action 4	Immature motivated stakeholders: a) engage local business companies into the dialogue, b) transform outcomes of the debates and collected data into codified knowledge, c) select pilot cases for some initiatives, d) assist in implementation of the pilots.	Implemented. We have helped 15 SMEs from Sunrise valley STP to start innovative projects and use the support of available Operation Program measures, i.e. „InoStartas LT“ measure scheme.
Sub-action 5	Working with other stakeholders: a) run a series of team-up events, b) select initiatives for the the pilot projects, c) monitor the pilot activities and disseminate final results.	Implemented. We have run 10 team-up events during CLP and Futurepreneurs competitions.
Timeframe	January, 2020 – December, 2021.	Reported in PR8.

The impact of COVID19 was not substantial enough to decrease the motivation of companies to invest of R&D.

We have measured the indicator "Business sector expenditure on R&D per capita" for the InoStartas scheme. In the beginning of 2019 year, indicator was 38.74 Euro/per capita and in the 2021 - it was 60.70 Euro/per capita. It is clear to say that because of the "InoStartas LT" scheme the business sector expenditure of R&D per capita almost doubled during 3 years.

In addition, we have measured the indicator "Number of enterprises cooperating with research institutions". Thus, from the beginning of year 2019 there were 4 enterprises applied for support were already working with national research institutions and during the past 3 years that number increased into 60. Almost half of supported SMEs are from the central regions like Vilnius, Kaunas and Klaipeda, and the others from the rest of the region of Lithuania.

There were 15 SMEs from Sunrise valley Science Technology Parks (STP) cooperating in new projects with universities, research and science centres.

5 Conclusions

During the COVID-19 crisis, Lithuanian businesses were and are constrained by a combination of unique and unprecedented constraints on supply and demand. Recognizing that innovation is needed not only to manage the pandemic and its aftermath, but also to accelerate economic recovery and further increase economic resilience, its promotion has become priority for several Lithuanian policies (e.g. R&D, Digitalisation, Creative arts and Culture).

In Lithuania, the widespread practice of promoting COVID-19 among the international community has been applied as well for health-related innovations firstly. Secondly, the pandemic has made it clear that companies must change established business models and digitize business processes. Sunrise valley STP have implemented online tools to encourage these processes both in Lithuania and abroad (e.g. digital maturity assessment tool). Thirdly, in order to address the challenges of COVID-19, Lithuania has carried out various hackathons to bring together different stakeholders (business, science, public sector) and use innovation as a potential tool to address them (e.g. Hack4Vilnius). Finally, the COVID-19 pandemic disrupted global value chains, forcing many countries to rethink their ability to attract FDI. In this context, Lithuania, in response to the resulting situation, a financial instrument (SMART FDI 3) for foreign direct investment and innovation was launched, which aim is to attract foreign investment in R&D and innovation to Lithuania.

It is important to emphasize that most of the tools listed above in the world and in Lithuania could be used in the future, depending on the challenges that hinder the innovative activities of companies. Some of the measures listed above could be adapted in response to the situation (e.g. targeted financial incentives for R&D).

In order to reduce the impact of the economic downturn on innovative business activities, Lithuania has the best possible use of the newly introduced schemes. The structural shock can help the Lithuanian economy to transform to better added value and resilience to various crises, so targeted and effective promotion of business innovation through the EU Cohesion Policy Funds and the Recovery and Resilience Fund will be extremely important.