



# Summary

## Purpose and scope of the evaluation

The evaluation aimed to assess the support measures of Priority Axis 1 (PA) of the Operational Programme "Growth and Employment" of the EU funds programming period 2014-2020. The goal was to determine the extent to which the program has helped transform the national economy by increasing its productivity, efficiency, and the utilization of more efficient resources based on research projects results. The evaluation also analyzed the impact of investments on competitiveness, technological development, and the promotion of research and innovation. Furthermore, it assessed the contribution to the increase of research and innovative capacity of Scientific Institutions (SI), Higher Education Institutions (HEI) and enterprises in Latvia.

## Development of research and innovation ecosystems

The projects supported by 1 PA have made a significant contribution to the development of research and innovation ecosystem: development of human capital, research, acquisition of scientific infrastructure, supported development of innovative technologies and products. The impact of the investments was increased by the synergies between the 1 PA measures, providing support for various technology readiness level (hereinafter - TRL) projects and enabling higher education institutions (hereinafter - HEIs), R&I and enterprises to develop complex and joint projects. The 1 PA projects also contributed to the implementation of the recommendations of the international assessment of the activities of the SI organized by the Ministry of Education and Science (hereinafter - MES), as well as to the achievement of the goals of the European Research Area (hereinafter - ERA).

Total European Regional Development Fund (hereinafter - ERDF) funding for the EU funds programming period 2014-2020 for 1 PA was 424.2 million EUR or **36.3 % of Latvia's investment in research and development**, which indicates the importance of ERDF for the funding of the research and innovation ecosystem.

One of the main priorities of 1 PA was to further enhance the competences of researchers. In this regard, **2,594 full-time equivalent (hereinafter - FTE) researchers, or 63.7 %** of all FTE researchers. The largest number of PLE researchers refers to researchers (2121 or 52 % of all FTE researchers) who work with advanced research infrastructure. Investments have also been made in the development of young researchers (242 or 5.9 % of all researchers), thus providing support in the formation of the regeneration of researchers, however, to ensure the regeneration of researchers, it would be necessary to increase the number of supported young researchers to 300. 433 researchers or about 10 % of researchers have participated in competence center (hereinafter - CC) projects, the cooperation of enterprises with researchers has also been in research projects of a practical orientation, thus promoting the cooperation of HEI, ZI and enterprises and the commercialization of research results.

According to more than 30 interviews with HEI and SI, investments in scientific infrastructure of HEI and HEI amount to 110.1 million. In the amount of EUR ERDF funding, they were recognized as the most significant among all measures of the 1 PA and improved the scientific research environment for 52 % of researchers, as well as promoted the development potential of researchers, giving the opportunity to become more involved in the projects of the "Horizon 2020" and "Horizon Europe" programs. Investments in scientific infrastructure comply with the recommendations of the international evaluation of SI regarding criterion D (research environment and infrastructure of the institution). These investments have also contributed to the achievement of EPT goals - to provide researchers with better access to infrastructure (52 % of all FTE researchers) and facilities; promote researchers' mobility, skills, and career development opportunities. HEI and HEI's desire for similar investments in the future should be linked to scientific infrastructure utilization rates, because according to the FIDEA study (year 2024), 70 % of HEI and HEI use less than 60 % of the capacity of the existing scientific infrastructure, while only 18 % use more than 80 %. The uniqueness of the facilities could also be measured, as this is one of the factors that could interest foreign partners. According to the results of the same study, facilities are not unique,

for example, 65 % of research facilities are unique in Latvia, only 30 % of research facilities are unique in the Baltics and a very small percentage or 10 % are unique in Europe.

**A total of 2,819 scientific publications have been prepared and published** from the total number of all publications listed in the National Scientific Activity Information System (hereinafter - NSAIS) in the period 2014-2020. year. The implemented projects have not only provided the necessary funding for research and the publication of research results, but also contributed to the improvement of the quality of research. The 730 scientific articles prepared within the framework of 1 PA activities are indexed in Web of Science and/or SCOPUS. The greatest contribution to the increase in the number of scientific publications was made by practical-oriented research and post-doctoral research, which resulted in the publication of 1323 (measure 1.1.1.1) and 1381 (measure 1.1.1.2) scientific articles. In the period from 2015 to 2021, the number of Latvian scientific articles in highly cited journals (Q1 and Q2) increased approximately twice, and as a result, funding from EU funds made a large contribution to its achievement. It is not possible to determine the exact impact of EU funds, because this type of statistics is not collected. Funding from EU funds has contributed to the development and recognition of the competence of Latvian researchers in such fields as organic chemistry, pharmacology, biology, biomedicine, and material science.

As part of the scientific publications will be published in scientific publications even after the end of the project implementation, it is expected that the overall result achieved in terms of the number of publications will increase even more. Improving the number and quality of publications corresponds to the recommendations of the international evaluation of SI regarding criterion A (research quality) and criterion B (research impact). The investments made have additionally contributed to the achievement of the EPT's goal - to support open science and better exchange of knowledge.

1 PA projects contributed to the development of international research projects, **support has been provided to prepare 768 applications for Horizon 2020 projects, which is 24.4 % of all project** applications prepared by Latvia in the period 2014-2020. 1 PA intervention measures have contributed to improvement in Latvia's success rates in the "Horizon 2020" program, increasing this rate from 14.6 % to 23.9 % (EU average 20.98 %). The 1 PA has promoted the recognition of Latvian scientists by participating in international projects, as well as the increase of available funding for R&I from the funding of the "Horizon 2020" program (total amount of funding - 116.8 million EUR). Active participation in the programs "Horizon 2020" and "Horizon Europe" corresponds to the recommendations of the international evaluation of SI regarding criterion E (development of the institution's potential, increasing international cooperation). 1 PA measures contributed to the registration of 73 patents (3.9 % of the total number of patents (1866) in Latvia in 2020) and 42 intellectual property licenses or transfer agreements. Considering the focus of the 1 PA activities on the development of the R&I ecosystem, a total of **1,543 new technologies and products have been developed**. The involvement of SI and HEI researchers in enterprise research projects, as well as the commercialization of research, has contributed to the implementation of the recommendations of the international evaluation of SI regarding criterion C1 (economic impact of research) and criterion C2 (social impact of research). Investments have contributed to the achievement of EPT's goal - to learn the results of research and innovation in the markets.

Practically oriented research, acquisition of scientific infrastructure, research commercialization measures, introduction of new products and technologies, projects implemented by CC and other activities contributed to the transformation of Latvia's national economy towards high added value entrepreneurship and the development of smart specialization areas. Information on the impact of implemented measures on the national economy was measured only for CC projects (increase in the turnover of enterprises by EUR 213.5 million) because only for those projects the increase in the enterprises turnover was measured. The greatest impact was in the field of RIS3 "knowledge-intensive bioeconomy", where the turnover of enterprises increased by about 940 million during the evaluation period. EUR, but because of the CC project, the turnover of enterprises increased by 131 million. EUR, therefore, the impact of projects financed by EU funds has been large, or 14 % of the turnover growth of the field. In the area of RIS3 "biomedicine, technology, biopharmaceutics, biotechnology", the increase in turnover during the analysed period was about 60 million EUR, but the turnover increased by 4 million EUR or 6.5 % of the increase in turnover due to the CC project. In the field of RIS3 "smart materials, technologies and engineering systems",

the turnover increased by 31.6 million EUR or 2.3 % of the turnover growth of the area. In the field of RIS3 "smart energy", the turnover increased by 4.5 million EUR or 0.6 % of the area's turnover. In the field of RIS3, the turnover of "information and communication technology" increased by 42.5 million EUR, or 4.1 % of the area's turnover. Other measures of the 1 PA have also contributed to the increase in the turnover of enterprises, so the overall impact on the transformation of the national economy is even greater.

1 PA measures have contributed **to the improvement of awareness of innovations**, which was provided in the form of measures such as trainings, conferences, master classes, hackathons, student training enterprises, innovative ideas contests, training seminars, etc. Non-financial support has been received by 66,131 persons (measure 1.2.2.2), which is 6 % of the population aged 16 to 65 living in Latvia. The impact of the events cannot be quantified, but considering the number of people involved (6 %), the events created an impact to promote the culture of innovation for various parties involved, and this impact was also promoted by other 1 PA events, such as innovation grants for students.

Practical organizational and marketing skills in developing new or improved products, processes, services, technologies, prototypes, and methods in the development of the innovation system were also received by students who are future researchers and entrepreneurs. 1.1.1.3. 6142 students, or 8 % of the total number of students in Latvia, were supported within the framework of the event, which gave them the opportunity to improve their innovation and entrepreneurial competencies. Investments have contributed to the achievement of the EPT goal - to involve citizens and research and innovation organizations more.

1 PA provided training for employees in two events, training a total **of 35,178 employees** or 3.9 % of all actively employed, including in various regions of Latvia. Within the framework of training events, the productivity and work efficiency of self-employed persons, small, small, and medium-sized enterprises (hereinafter - SMEs) and large enterprises have been promoted by increasing the qualifications and skills of employees in digital technology, digitization of internal enterprises processes, production of digital tools, service development and other areas.

To ensure the targeted results and focus of the planned investments, as well as a higher return, investment **in the areas of planned and implemented smart specialization strategies**. Most of the projects – 420.3 million EUR ERDF funding, or 67.5 % of the total investment volume, is indicated in the area of smart specialization of the project. The most significant ERDF investments were made in areas such as "Smart materials, technologies and engineering systems" - 150 million EUR or 35.7%, "Biomedicine, medical technologies, biopharmaceutics and biotechnology" – 100.99 million EUR or 23.8 %, "Knowledge-intensive bioeconomy" – 64.6 million EUR or 17 % and "Information and communication technologies" – 64.1 million EUR or 16 % and "smart energy" - 33.6 million EUR or 8% of RIS3 investments.

161.9 million EUR of ERDF, or 32.5 % of all funding a specific area of smart specialization was not allocated and investments are horizontally applicable to all areas of RIS3 as a whole. For example, 1.1.1.3. for the event (innovation grants for students) because it is oriented towards the development of innovation culture in all areas of RIS3 as a whole; 1.1.1.4. for the measure (R&D infrastructure) because the purchased scientific infrastructure can be used in different areas of RIS3; 1.2.2.2. for the measure (innovation motivation), as it includes the development of the culture of innovation and not the development of specific areas of RIS3; 1.2.2.3. for the event (ICT and non-technological training) because the training was planned for the employed in general.

1PA measures contributed to the development of regions, but the specific impact depended on the intervention of the implemented measure, for example, measures where the final beneficiaries were SI and HEI, the greatest impact was marked in Riga, because the majority of SI and HEI are in Riga. 1.2.1.4 measure had the greatest impact on the development of regions (introduction of new products) as it relates to doing business in different regions. Training events had an impact on regional development, but in Riga this impact was significantly higher. The evaluation report indicates the regional impact of each of the evaluated measures.

**EU funds 2021-2027 during the annual planning period** similar measures are planned for the development of research infrastructure, the implementation of post-doctoral research, the implementation of practical research, international mobility, and the creation of support tools, linking them with the development of smart specialization areas, the implementation of student innovation programs, etc.

### Strategic recommendations

Based on the evaluation results obtained from various data sources, including interviews and survey results, below are summarized the most important strategic recommendations that can significantly improve the impact of EU fund investments in innovation and research development. The aim of these recommendations is to address the most important challenges and to offer solutions so that EU fund investments create a more efficient and sustainable innovation ecosystem.

- 1.** It is necessary to continue supporting the acquisition of strategic research infrastructure by the HEI and SI, as it is one of the main support instruments for infrastructure acquisition, ensuring further development of Latvia's research and innovation ecosystem, and promoting the attraction of other sources of funding to the activities of HEI and SI, such as participation in projects in the "Horizon Europe" program.
- 2.** Within the framework of supporting measures for the development of the innovation ecosystem, evaluate the possibility of planning specific objectives and determining the return at the project level, as well as planning smaller administrative costs for the implementation of measures..
- 3.** Reduce the number of institutions involved in implementing the 1 PA measures. Evaluate the possibility for measures where the number of projects implemented is not too large and is not related to industry-specific issues, and where the project implementers are also the ultimate beneficiaries, to entrust the implementation supervision of the projects solely to Central Finance and Contracting Agency, without involving other institutions. In measures where project implementers and ultimate beneficiaries differ and the number of ultimate beneficiaries is measurable in hundreds, entrust the implementation of projects to institutions that are most familiar with the needs of the ultimate beneficiaries.
- 4.** Support supporting enterprises in their research and innovation efforts and export promotion activities with EU grant assistance and support the introduction of new technologies and products by enterprises, such as technology acquisition, using financial instruments from EU funds.
- 5.** Income and outcome indicators are recorded in the Cohesion policy fund management information system (CPFMIS), and sector ministries also record specific outcome indicators. Information on outcome and income indicators is aggregated in large datasets or standard reports (a set of standard reports defined by CPFMIS and available to all system users, indicating parameters by which to select information).

Considering the significance of outcome and income indicators in the monitoring of EU fund data measures, it is necessary for one institution and one system, for example, in the CPFMIS system administered by Central Finance and Contracting Agency, to aggregate all information on outcome and income indicators, as well as to create standard reports, including planned and actual values and calculating deviations. It should be noted that not all measures in the CPFMIS system will have information at the ultimate beneficiary level; therefore, functionality should be provided in CPFMIS to enter consolidated outcome indicators per measure if information at the ultimate beneficiary level is not available in CPFMIS, and to aggregate this information by the responsible institution (hereinafter referred to as RI).

Ensure information collection by RIS3 sectors, and in cases where information on RIS3 sectors is collected by RI outside CPFMIS, aggregate the overall information on RIS3 sectors at the 1 PA level via CPFMIS.

Considering various data sources and information aggregators, Central Finance and Contracting Agency, in collaboration with RI, should ensure integrity checks of CPFMIS data.

**6.** To promote EU fund investment in the transformation of the economy into RIS3 sectors and to increase the volume of private investment, HEI and SI should actively continue to promote cooperation with enterprises in RIS3 sectors.