ACTION PLAN OF THE PRIORITY "TECHNOLOGY FOR THE DEVELOPMENT AND USE OF SMART LOW-ENERGY BUILDINGS - DIGITAL CONSTRUCTION" OF THE PRIORITY AREA OF RESEARCH AND ENVIRONMENTAL (SOCIO-CULTURAL) DEVELOPMENT AND INNOVATION (SMART SPECIALIZATION) "ENERGY AND SUSTAINABLE ENVIRONMENT"

CHAPTER I
GENERAL PROVISIONS

1. The action plan of the priority "Technology for the Development and Use of Smart Low-Energy Buildings - Digital Construction" of the priority area of research and environmental (socio-cultural) development and innovation (smart specialization) "Energy and Sustainable Environment" (hereinafter - the Priority RDI development area) (hereinafter – the Action Plan) was drawn up in the implementation of the Implementation Programme of Priority Areas of Research and Experimental (Socio-cultural) Development and Innovation (Smart Specialization) and their Priorities approved by Order No. 411 of the Government of the Republic of Lithuania of 30 April 2014 *On the Approval of the Programme for the Implementation of Priority Areas of Research and Experimental (Socio-Cultural) Development and Innovation (Smart Specialization) and Their Priorities* (hereinafter - the Programme).

2. The Action Plan was drawn up for establishing the provisions of the implementation of the Priority "Technology for the Development and Use of Smart Low-Energy Buildings - Digital Construction" of the Priority RDI development area "Energy and Sustainable Environment".

3. The Action Plan shall be implemented in 2015–2020.

4. Concepts used in the Action Plan shall bear the following meanings in this legal act:

4.1. **Automation** shall mean the transformation of processes and equipment into the automatic mode of operation.

4.2. **Building information modelling model** shall mean a virtual object model composed of individual information elements: geometric parameters (size, volume, etc.), physical parameters (mass, material, physical constants, etc.), technical and technologic parameters, granted (assigned) parameters (name, cross-section, labelling, standards, and so on), etc. All this information creates intellectual building elements, which can respond to inquiries and provide the available information in a desired form - graphical or numerical (hereinafter - the BIM model).

4.3. **Information and communication technologies** shall mean the use of computer applications and computer hardware in conveying, providing information, teaching and learning (hereinafter - ICT).

4.4. **Information technology** shall mean the totality of tools and methods (hardware and software) for processing data: collecting, sorting, storing, transferring or otherwise administering using a computer. Does not include electronic communications (hereinafter - IT);

4.5. **Infrastructure** shall mean the totality of generally interrelated structural elements enabling or supporting the entire structure and the functioning thereof. The concept is understood as a set of information and communication technology legal framework, physical structure, allowing a solution to function, or a set of objects of various areas of operations administering households and providing services to residents (engineering networks, transport communications, utilities, public, commercial

and other objects necessary for providing services to residents and improving the quality of the environment).

4.6. **Smart building** shall mean a building, object or structure, for the sustainable use and maintenance whereof a management technology has been installed, which interconnects the structure of a building, its engineering systems, users and functional technologies, global environment, smart grids and future technologic development.

4.7. **Four-dimensional space** (4D) shall mean a space where a three-dimensional object (3D model) is usually reflected in time. By using a design model as a source of original information for the performance of construction works, a constructional BIM model of a building is created.

4.8. **Classifier** shall mean a structured list of objects or their groups (classes) for grouping data, which includes codes of these objects or their groups compiled in a certain structure, their names and descriptions of features thereof, mutual relations, and relation to classifiers of various different activities.

4.9. **N-dimensional space** (nD) shall mean various other possible dimensions of a model based on the goals set for a BIM model, for example, in all subsequent stages of a structure management and its life cycle - operation, repair, reconstruction and dismantling, energy efficiency or life cycle analysis, logistics and others. Higher than 5D specific dimensions have not been defined in the global practice and can be used differently.

4.10. **Energy efficiency of a building (a part thereof)** shall mean a quantity of energy calculated following the Regulation requirements, expressed as an energy efficiency class of a building (a part thereof) necessary when using a building for its intended purpose.

4.11. **Five-dimensional space** (5D) shall mean a space where construction economic indicators by material and structure quantities are obtained from BIM 3D model together with the price of resources allocated by the time of production.

4.12. **Digital construction infrastructure** shall mean a digital construction basis including the overall system of building information modelling requirements, construction information classification, legal framework, data exchange and integration with various related digital infrastructures and databases.

4.13. **Building information modelling** shall mean the process of a creation and management of an information model of a building throughout its entire life cycle. This modelling is usually conducted by using object-oriented modelling software, thus seeking to increase the efficiency of a building's design and construction. During the process, an information model of a building with the entire information on geometry of a building, its spatial relations and nodes, number of building elements and features thereof is obtained: i) structure or building – a three-dimensional model-based project, which considers the entire life cycle of a building (design, construction, operation, reconstruction); ii) information shall mean total information of the building throughout its entire life cycle collected in the model; iii) modelling shall mean modelling of a building and processes related to the realization and operation thereof using integrated tools.

4.14. **Three-dimensional space** (3D) shall mean a space used to create a collection of points connected in lines, curves, planes, etc., in the use thereof volumetric objects are obtained. 3D objects can be reflected as items created in real space (exhibited live), three-dimensional optical (hologram) spatial images, two-dimensional images simulated by three-dimensional object computers.

4.15. **Knowledge base** shall mean a data base storing output rules and information on the knowledge and experience of a certain subject area accumulated by people. A knowledge base is a basis of any expert system.

5. Other concepts used in the Action Plan shall correspond to concepts used in the Programme.

CHAPTER II
DESCRIPTION OF THE CURRENT SITUATION

6. Digital construction is successfully operating in foreign countries. Denmark, Great Britain and other countries can be viewed as examples of good practice. Different progress has been achieved

in the European Union states in the development of BIM methodology, but one thing is clear - the application of IT and digital construction principles will bring significant changes in all areas of the country's life. This will change a practice of many state management processes and will have a significant impact on the policy of the use and saving of state's financial, energy, labour and other resources. The digitalization of construction processes (introduction of digital construction) is aimed at improving construction efficiency and quality. Digital construction obligates companies to use the same data and drawings in all phases of the construction process. The communication of all construction process participants in a unified and standardized "digital construction language" leads to increased possibilities of avoiding misunderstandings, defects and delays in the implementation of a construction project.

7. Digital construction is a promising area of economic activity with about 6 thousand companies operating therein. An increasing number of companies is applying digital construction systems, however, products created by foreign producers are used for the most part.

8. The scope of investments of business companies into research and experimental (socio-cultural) development (hereinafter - R&D) projects during 2007-2013 was about EUR 0.9 million; these investments were intended for acquiring technologies.

9. Digital construction industry is a rapidly developing global market. The forecast is to have revenues from digital construction grow to EUR 5.1 billion world-wide by 2020 (in 2012, they accounted for a mere EUR 1.4 billion).

10. The Lithuanian science and education institutions and business companies closely cooperate in participating in the activities of the organization "Digital Construction", the Lithuanian Builders Association, Lithuanian Chamber of Architects, Lithuanian Association of Consulting Companies, Lithuanian Association of Civil Engineers, Lithuanian Real Estate Development Association, Structural Engineers Club, the National Association of Passive House, the Lithuanian Roads Association, the Lithuanian Electricity Association and many others. A common digital construction model "Guidelines for Digital Construction in Lithuania 2014 - 2020" was compiled in 2014. Cooperation and synergy with information and communication technology and logistics sectors is possible.

11. Potential of Lithuanian science and education institutions in the areas of electricity and electronics, computer science, construction, environment, materials, mechanics, measurement engineering and energy is relatively high; a significant progress was already achieved in the implementation of research. Top-level international scientists have been brought together in science and education institutions, who are engaged in R&D activities in areas most relevant to the Priority. The scope of preparing specialists of these areas has been increasing each year.

In the implementation of the programmes for the development of integrated centres for science, studies and business (valleys), research centres are being established in science and education institutions, the R&D infrastructure present wherein can be used for the activities relevant to the implementation of the Priority. The National Open Access Scientific Centre for Future Energy Technologies in the Lithuanian Energy Institute, also Vilnius University Information Technology Open Access Centre set up on the basis of IRT science potential with the largest and most modern supercomputer in the country can be distinguished among such research centres. Also, Civil Engineering Research Centre operating in the Vilnius Gediminas Technical University, which has brought together researchers working in R&D areas relevant to the implementation of the Priority, is worth mentioning here. These research centres serve the needs of both the scientific community and the private sector.

The new EU Framework Programme for Research and Innovation *Horizon 2020* provides for a public task "Safe, Clean and Efficient Energy", in the implementation whereof active involvement of Lithuanian researchers and other specialists is expected. Significant participation of the Lithuanian researchers is also expected in the implementation of such priorities of the *Horizon 2020* programme as "Smart Cities and Communities" and "Energy Efficiency".

Cost-effective and efficient use of energy, reduction of adverse energy impact on the environment are one of the most important challenges and priorities of the country seeking for

efficient and sustainable development of the economy. Introduction of digital construction is a new area, which can quite significantly contribute to resolving the above-listed challenges; however, active involvement of the state government is necessary in order to introduce digital construction principles nation-wide. Also, scientific and innovative capabilities, which may become a basis for efficient implementation of digital construction principles in the country's construction, energy and other sectors, are very important for this process. The successfully implemented Priority is expected to have a significant influence on the development of digital construction in Lithuania.

12. In order to implement the Priority, it is very useful to enhance and concentrate R&D resources is such thematic R&D areas as construction engineering, energy, environmental engineering, computer science engineering, transport engineering, electric and electronic engineering. Each direction is important in the creation and development of a classifier and infrastructure of own part, also, in the creation of energy efficient building models and construction technologies as well as comprehensive solutions of renewable energy sourced integrated into a building. It is also very important to evaluation the integration of logistics solutions in such thematic R&D areas as material engineering, measurement engineering, also to cooperate with researchers and other specialists participating in the implementation of other priorities of research and environmental (socio-cultural) development and innovation (smart specialization) priority areas in the creation of models of energy efficient buildings barely using any energy. In order to enhance capabilities of human resources in these areas, high-skilled professionals should be prepared and R&D activities conducted by doctoral students in the areas of innovative energy and construction technologies should be supported. Also, it would be beneficial for Lithuania, which seeks to promote the country's economic transformation and competitiveness using its available resources, to enhance business skills in contributing to the development and implementation of the created technologies in such economic areas as construction, transportation, energy, construction of innovative buildings barely using any energy, information and communication technologies. In order to successfully implement the Priority, it is also necessary to organize trainings of all participants in the process, initiate the update of various technical normative base, creation of a knowledge base, to promote R&D activities of innovative energy technology areas, optimize the monitoring system of target goals and results.

CHAPTER III
ALLIGNMENT OF THE ACTION PLAN TO THE PROGRAMME AND OTHER STRATEGIC LEGAL ACTS

13. The Action Plan contributes to the implementation of the strategic goal and goals provided for in subparagraphs 19.1 and 19.2 of the Programme as well as of the task established in subparagraph 20.1 – to promote R&D and innovation activities, which would allow for greater diversification of energy sources, reduction of energy prices, cost-effective and efficient use of energy and sustainable change of ecosystems (especially, efficient control of waste, reduction of air and water pollution).

14. Actions of the Action Plan:

14.1. to create and introduce new technologies, products process and methods in the market;

14.2. to promote the creation of knowledge-intensive business, the development of enterprises with huge potential;

14.3. to encourage clusterization, integration into international value creation networks and investments into R&D and innovation;

14.4. to promote cooperation between research and business, transfer of knowledge and technologies with the aim to commercialize R&D results;

14.5. to enhance the potential of science and education institutions and their abilities in the creation and commercialization of knowledge, also, to prepare research and innovation management specialists.

15. In the implementation of the Action Plan, the intension is to contribute to changes, which are expected in the implementation of the National Progress Strategy *Lithuania 2030* approved by

Resolution No. XI-2015 of the Seimas of the Republic of Lithuania *On the Approval of the National Progress Strategy Lithuania 2030* of 15 May 2012. Results achieved during the implementation of the Priority are inseparable from the installation of advanced, resource-saving and climate change-mitigating technologies and products in the industrial, energy and transport sectors, thus the Priority will mostly contribute to the implementation of the smart economy creation vision - to achieve energy independence and engage in sustainable development of the use of environmentally friendly resources.

CHAPTER IV
STAGES OF THE IMPLEMENTATION OF THE PRIORITY

16. Measures for the implementation of the Priority have been selected pursuant to the Lithuanian Innovation Development Programme approved by Resolution No. 1281 of the Government of the Republic of Lithuania of 18 December 2013, the National Programme for the Development of Studies, Research and Experimental (Socio-Cultural) Development for 213-2020 approved by Resolution No. 1494 of the Government of the Republic of Lithuania of 5 December 2012 and the implementing legislation thereof.

17. A set of study, R&D and innovation policy measures necessary for the implementation of the Priority has been identified in light of the report *Priority Implementation Signposts* drawn up on 21 February 2014 by international group of independent experts. Pursuant to this report, the following Priority implementation stages can be distinguished:

17.1. the stage of generation of scientific potential critical mass includes activities related to the creation of appropriate environment for the search for new ideas and solutions, development of technologies and prototypes and the readiness to carry out these activities;

17.2. the search for new ideas and solutions includes fundamental research of general and targeted nature necessary for the implementation of the Priority;

17.3. the stage of the creation of technologies and their prototypes includes industrial research and experimental development activities necessary for the implementation of the Priority;

17.4. the stage of introduction into the market includes activities related to introducing new products into the market;

17.5. the stage of generating critical mass of business potential includes activities related to the transmission and dissemination of knowledge and innovation, and the use thereof at large.

18. Actions established in subparagraphs 14.1–14.5 of the Action Plan are implemented by executing the measures set forth in Annex 1 to the Action Plan.

19. Annex 2 to the Action Plan provides for a set of education and RDI policy measures relevant in each Priority implementation stage.

20. Annex 1 to the Action Plan establishes actions and measures implemented given the set of education and RDI policy measures presented in Annex 2.

CHAPTER V
THEMATIC SPECIFICS OF THE PRIORITY

21. The implementation of the Action Plan is aimed at:

21.1. exploring and developing algorithms, methods and/or technologies of the efficiency analysis and optimization of information modelling (BIM) requirements of a building, construction information classifier and data exchange between different construction processes. In the implementation of the Action Plan, the aim is to create various enhancements of the common BIM methodology and construction digital infrastructure intended for increasing the efficiency and competitiveness of the construction sector, optimizing digital models of structures, creating new BIM digital products and services, mutual integration, developing new construction business models and BIM methodology;

21.2. exploring and developing technologies for the creation of construction technologic knowledge bases and management, aligning and integrating the related legal base and created solutions with the development of digital construction;

21.3. exploring and developing technologies for creating models for the new construction, modernization and reconstruction of digital buildings barely using any energy, including such activities as the optimization of all construction processes (formation of the needs of clients, planning, procurement, design, construction, project management, resource management, logistics, construction control, commissioning, operation, etc.), inter-compatibility, integration with other related business processes, digitalization, automation and efficient information management, information and communication technology solutions, organizational and economic infrastructure necessary for that. All the created solutions must be in line with the common BIM methodology, comprehensively involving 3D, 4D, 5D and other dimensions of information models being created.

22. Successful performance of activities listed in subparagraphs 21.1–21.3 of the Action Plan is inseparable from R&D activities carried out by public and private institutions.

23. Important role in the implementation of the Priority is played by joint initiatives for educational, research and experimental (socio-cultural) development and innovation (hereinafter - joint initiatives), on the basis whereof problems relevant to sectors of economy are planned to be solved conducting R&D activities on topics relevant to the sectors of economy and hoping for the inclusion of private sector entities in the realization of R&D activity results. In the implementation of joint initiatives, given the activates provided for in subparagraphs 21.1–21.3 of the Action Plan and actions laid down in subparagraphs 14.1–14.5 of the Action Plan, R&D activities are carried out in order to:

23.1. determine the need for the transfer of information between various construction processes (also digital information and document structures), analyse possibilities for the creation thereof, relationships between construction processes and legal base, create and optimize their structure and content;

23.2. analyse global practices of digital construction, energy efficiency, information modelling of energy efficient buildings and evaluation of a "healthy" building in a sustainable environment and to explore possibilities for adaptation thereof to the Lithuanian market;

23.3. create and optimize concepts of a unified structure and its infrastructure complex project information classifier, also data base models;

23.4. create, adapt, update and optimize methodologies of information modelling of energy efficient structures and the evaluation thereof in a sustainable environment, also to analyse the already implemented pilot projects;

23.5. create technical concepts for the creation, transmission and integrates use of construction processes and digital data of products, and to prepare methodologies thereof;

23.6. prepare models of construction knowledge base structure in line with a construction classifier, content creation, information processing, digital management and innovation dissemination methodologies;

23.7. create, implement, test and analyse pilot prototypes of information models of energy efficient smart structures in a sustainable environment;

23.8. create, adapt and test technical prototypes of the creation, transmission and integrated use of digital data of construction processes and products;

23.9. create, test and optimize prototypes and pilot versions of technologic knowledge bases and smart information management systems;

23.10. test digital construction training and innovation dissemination centre models.

24. The implementation of joint initiatives seeks that activities listed in subparagraphs 23.1–23.10 of the Action Plan would allow the following:

24.1. supplementing and optimizing the prototype of a construction information classifier, installing, supplementing, constantly renewing and optimizing it;

24.2. introducing information modelling methodologies of energy efficient smart structures in a sustainable environment in the market and exporting them as well as the services related thereto;

24.3. issuing manuals for the optimization of construction processes and construction produce production processes and software intended for that;

24.4. introducing in the market construction technology knowledge bases and intellectual and smart information management systems aligning with the legal base and constantly updating them;

24.5. implementing digital construction training and innovation dissemination models, aligning them with the legal base and constantly updating them;

24.6. integrating BIM requirements with the public procurement system, implementing digital construction and BIM models in the construction sector;

24.7. disseminating and developing innovative solutions of digital construction processes and construction process production process optimization models, smart specializations and good practices thereof;

24.8. preparing wide deployment platform of digital construction technologies in the construction sector.

25. Subparagraphs 23.1–23.10 of the Action Plan can be amended by crossing out or supplementing the planned activities upon the proposal of the coordination group of the research and experimental (socio-cultural) development and innovation priority implementation formed by Order No. V-576/4-409 of the Minister of Education and Science and the Minister of Economy of 20 June 2014 (hereinafter - the Coordination Group), given the data collected at the time of monitoring and evaluation of the implementation of the Programme and the Action Plan or other reasonable data and proposals.

CHAPTER VI
IMPLEMENTATION OF THE ACTION PLAN

26. Possible sources of the implementation of the Action Plan:

26.1. state budget funds of the Republic of Lithuania:

26.1.1. funds for measures of the 1st priority "Promoting Research, Experimental Development and Innovation" of the European Union structural fund action programme 2014-2020 (hereinafter - the Action Programme), 3rd priority of the Action Programme "Promoting Competitiveness of Small and Medium Enterprises" and 9th priority of the Action Programme "Public Education and Increase of Human Resource Potential";

26.1.2. Lithuanian state budget funds (excluding the European Union structural funds);

26.2. funds of science and education institutions;

26.3. funds of private legal entities;

26.4. funds of the European Union Research and Innovation Programme *Horizon 2020* and other international programmes.

27. A part of funds for measures of priority 1 and priority 9 of the Action Programme are intended for direct support of activities necessary for the implementation of the Priority, thus table presented in Annex 1 provides for a preliminary amount, which is planned to be used for the implementation of the Priority depending on need.

28. A part of funds for measures of priority 1 of the Action Programme unattributed to any specific priorities of priority areas of research and experimental (socio-cultural) development and innovation (smart specialization) (hereinafter - RDI priorities), the results of the implementation thereof can contribute to the implementation of all or the majority of RDI priorities. These measures are marked in the table presented in Annex 1 to the Action Plan with an asterisk.

29. Measures implemented by a part of priority 9 of the Action Programme and the Lithuanian state budget funds are relevant to the entire R&D and innovation system and are not attributed to any specific RDI priorities, but their implementation results can also contribute to the implementation of the Priority. These measures are marked in the table presented in Annex 1 to the Action Plan with two asterisks.

30. Measures of priority 3 of the Action Programme are relevant to the entire system of improving business conditions and assistance for business, but they will indirectly contribute to the

implementation of the Action Plan, mainly allowing private sector entities to introduce new products in the market and generating critical business potential mass.

In the implementation of measures of priority 3 of the Action Programme, the plan is to support such activities relevant to the implementation of the Priority as the creation of the design of produce and/or products, installation of high-impact technologies in traditional industries, presentation of produce in international exhibitions and/or fairs, certification of the products and services planned for export, increase of new capacities of production and service provision, development of infrastructure of business incubators, membership in international networks (platforms), increasing awareness of new products and services, and business start-up advice.

31. The plan is to have funds of science and education institutions attracted by supporting activities related to the creation and renewal of education and RDI infrastructure necessary for the implementation of the Priority (by implementing infrastructure projects, co-funding of science and education institutions is expected). These funds are included in the graph "State budget funds and other funds" in the table presented in Annex 1 to the Action Plan.

32. The plan is to have funds of private legal entities attracted by implementing measures, projects executed on the basis whereof are planned to be co-funded by the state; businesses will have to cover a part of the project value using their own funds. These funds are included in the graph "Private sector funds" in the table presented in Annex 1 to the Action Plan.

33. The Priority may be partially implemented by participating in the European Union Research and Innovation Programme *Horizon 2020* and other international programmes. Funds attracted participating in international programmes are not indicated in the table presented in Annex 1 to the Action Plan.

34. The implementation of the Action Plan seeks for quantitative and qualitative results in line with the evaluation criteria set in Annex 1.

35. Deadlines for publishing calls for applications for measures implementing the actions of the Action Plan or for concluding project lists will be planned for in accordance with the plans for publishing calls for applications and concluding project lists prepared by ministries, as provided for in administration rules of 2014-2020 EU fund investment action programmes approved by Resolution No. 1090 of the Government of the Republic of Lithuania of 3 October 2014 *On the Approval of Administration Rules of 2014-2020 EU Fund Investment Action Programmes*.

36. Development of the priority areas of research and experimental (socio-cultural) development and innovation (smart specialization) and the implementation of priorities thereof are coordinated by the Coordination Group.

37. The Programme and the Action Plans of the RDI Priorities are implemented to promote and support interaction and cooperation between business entities and science and education institutions. The promotion of cooperation between business entities and science and education institutions, in accordance with the procedure established by the Ministry of Education and Science and the Ministry of Economy, is implemented by the Agency for Science, Innovation and Technology. The implementation process of the Programme is continuously monitored by analysing and assessing the implementation of the Action Plans of RDI Priorities. Monitoring and assessment of the Programme implementation, in accordance with the procedure established by the Ministry of Education and Science and the Ministry of Economy, is carried out by the Science and Studies Monitoring and Analysis Center (MOSTA).

38. Infrastructure created and equipment purchased during projects planned to be funded from EU funds or other sources and executed on the basis of education and RDI policy measures set in Annex 1 to the Action Plan shall not duplicate equipment currently possessed by science and education institutions or other public sector entities, except for cases when the capacity of the existing equipment is not enough for ensuring the implementation of the Priority.

39. A list of measures presented in Annex 1 to the Action Plan may be amended in light of the results of the interim evaluation of the Priority implementation planned in 2018, also having assessed the needs of potential executors of the measures.

ACTIONS AND MEASURES OF ACTION PLANS, PRELIMINARY NEED FOR FUNDS FOR THE IMPLEMENTATION THEREOF AND EVALUATION CRITERIA

Actions and measures	Preliminary funds, thousand EUR			Institution in charge	Evaluation criteria of actions and measures	Criteria values	
	European Union structural funds	State budget and other funds	Private sector funds			2018	2023
Action 1. To create and introduce new technologies, products, processes and methods into the market:					**Created prototypes (concepts) of products, services or processes within 3 years after the implementation of the project (pcs.)**	**10**	**22**
Measure 1.1. Joint science and business projects contributing to the implementation of smart specialization	1 940	-	-	Ministry of Education and Science	Number of projects jointly executed by business, science and education institutions (pcs.)	2	4
	667	-	603	Ministry of Economy	Number of certified products (pcs.)	1	3
Measure 1.2. Support for the creation or development of the company's RDI infrastructure and implementation of RDI activities ("Intelektas")	6 142	-	5 621				
Measure 1.3. Support for company RDI providing innovation vouchers ("Inovaciniai čekiai")							
Measure 1.4. Support for patenting inventions and design ("InoPatent LT")							
Measure 1.5. Support for precertification of new products and technologies and for conducting tests in laboratories under actual conditions ("Inosertifikavimas")							
Action 2. To encourage the creation of knowledge-intensive business and development of companies having large potential:	1 303	-	145		**New companies having received investments within 3 years after the implementation of the project (pcs.)**	**1**	**2**

Measure 2.1. Support for the provision of innovation consulting services ("Inogeb LT")					Number of companies receiving financial support in some other form than a subsidy (pcs.)	1	3
Measure 2.2. Support to companies engaged in RDI by financial tools ("Technostartas LT", "Koinvest LT")							
Action 3. To promote clusterization, integration into international value creation networks and investments in RDI:					**New cluster members within 3 years from the start of the implementation of the project (persons)**	**2**	**4**
					Attracted foreign investments into RDI area by areas of smart specialization within 3 years after the implementation of the project (thousand EUR)	**42 353***	**95 295***
Measure 3.1. Support for cluster operation ("InoKlaster LT")	3 966	-	2 438		Number of legally binding agreements with international partners (pcs.)	4	10
Measure 3.2. Support for participating in international RDI initiatives ("InoConect LT")							
Measure 3.3. Support for investments into a cluster ("InoKlaster LT+")							
Measure 3.4. Support for attracting direct foreign investments in RDI area ("Smartinvest LT")	5 792*	-	-				
Measure 3.5. Support for direct foreign investments in RDI area ("SmartInvest LT+")	28 962*	-	32 011*				
Action 4. To promote science and business cooperation, transfer of knowledge and technologies in order to commercialize R&D results:					**Business R&D orders executed by science and education institutions (thousand EUR)**	**3**	**3,9**
					Revenues of science and education institutions from intellectual activity results (thousand EUR)	**2**	**2,5**
Measure 4.1. Creation of the material base intended for the implementation of joint science and business projects and the development thereof in science and education institutions (creation and development of infrastructure of centres of excellence)	8 690*	-	-	Ministry of Education and Science	Patent applications (pcs.)

Doctoral studies conducted together with business entities (number of doctoral students) | 0

1 | 1

2 |
| Measure 4.2. Support for the implementation of R&D activities executed by centres of excellence | 11 580* | - | - | | | | |
| Measure 4.3. Implementation of market-oriented science and business projects through cross-border network | 93 | - | - | | | | |

Measure					Indicator		
Measure 4.4. Promotion of commercialization of R&D activity results in science and education institutions	81	504**	-				
Action 5. To enhance the potential of science and education institutions and their abilities to create and commercialize knowledge and to prepare specialists:					**External users from foreign science and education institutions, Lithuanian and foreign business companies having used the renewed open access research infrastructure (funds received from these users (thousand EUR))**	**25,5**	**33,1**
					Number of publications in frequently cited periodicals (pcs.)	**7**	**9**
Measure 5.1. Renewal of RDI and education infrastructure in the areas of smart specialization	52 132*	-	-		Number of researchers working in improved research infrastructure base (full-time equivalents)	25	32
Measure 5.2. Creation and development of the European research infrastructures and Lithuania's integration into the European research infrastructures pursuant to Lithuanian research infrastructure signpost and ESFRI	26 066*	1008**	-		Number of spin-offs created in science and education institutions (units)	0	1
Measure 5.3. Renewal of equipment used in open-access centres by areas of smart specialization	30	-	-				
Measure5.4. R&D activities conducted by the Lithuanian science and education institutions	217	-	-				
Measure 5.5. Subscription of databases necessary for RDI activities	28 960*	-	-				
Measure 5.6. Creation of infrastructure of centres of excellence and parallel laboratories	26 640*	504**	-				
Measure 5.7. Development of information infrastructure for science and education (LITNET)	4 340*	-	-				
Measure 5.8. Attraction of foreign scientists and R&D activities	14 481*	-	-				
Measure 5.9. Promoting activities of innovation and technology transmission centres of science and education institutions	14 480*	-	-				
Measure 5.10. Ensurance of the doctoral study process; doctoral studies, trips, scholarship, R&D, transfer, funds for visits (including foreign doctoral students)	644	62 154**	-				
Measure 5.11. Employment of scientists and other researchers in knowledge-intensive enterprises	2 896*	-	-				
Measure 5.12. Attraction and reintegration of scholars	5 792*	-	-				
Measure 5.13. Student R&D activities	2 317*	-	-				

Measure 5.14. Promotion of post-doctoral internships	7 240*	-	-
Measure 5.15. Preparation of specialists in smart specialization priority-related study programmes	233	-	-
Measure 5.16. Development of science popularization system	12 000**		
Measure 5.17. Funding of undergraduate, graduate, integrated and non-degree studies	-	220 032**	-
Measure 5.18. Support for mobility of Lithuanian and foreign students and teachers	-	3 438**	-
Measure 5.19. Practical trainings for scientists and other researchers, participation of scientists and other researchers in targeted events of international programmes, participation of Lithuanian researchers in targeted meetings for the preparation of project applications, participation of representatives from Lithuania in the European Union and other international working groups, committees, commissions, related to research and experimental (socio-cultural) development. / Encouragement of participation in H2020	4 503**	258**	-
Measure 5.20. To ensure funding for R&D activities relevant to the solution of top-level problems strategically important to the public and the state as well as economic development	-	94 314**	-
Measure 5.21. To support cross-sectoral cooperation in R&D area	-	2 364**	-
Measure 5.22. To allow researchers to use digital scientific data resources	-	450**	-

* Funds unattributed to specific priority area of research and experimental (socio-cultural) development and innovation (smart specialization), their implementation results can contribute to the implementation of all or the majority of RDI priorities.
** Funds for measures, which are relevant to the entire RDI system and are unattributed to specific RDI priorities, their implementation results will also contribute to the implementation of the Priority.

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A SET OF EDUCATION AND RDI POLICY MEASURES

Generation of science potential critical mass	Search for new ideas and their solutions	Creation of technologies and their prototypes	Introduction into the market	Generation of business potential critical mass
Measure 5.1. Renewal of RDI and education infrastructure in the areas of smart specialization	Measure 1.1. Joint science and business projects contributing to the implementation of smart specialization			Measure 3.1. Support for cluster operation ("InoKlaster LT")
Measure 5.2. Creation and development of the European research infrastructures and Lithuania's integration into the European research infrastructures pursuant to Lithuanian research infrastructure signpost and ESFRI	Measure 1.2. Support for the creation or development of the company's RDI infrastructure and implementation of RDI activities ("Intelektas LT")			Measure 3.2. Support for participating in international RDI initiatives ("InoConect LT")
Measure 5.3. Renewal of equipment used in open-access centres by areas of smart specialization	Measure 5.4. R&D activities conducted by Lithuanian science and education institutions	Measure 1.5. Support for precertification of new products and technologies and for conducting tests in laboratories under actual conditions ("Inosertifikavimas")		Measure 5.11. Employment of scientists and other researchers in knowledge-intensive enterprises
Measure 5.5. Subscription of databases necessary for RDI activities	Measure 2.1. Support for the provision of innovation consulting services ("Inogeb LT")			
Measure 5.6. Creation of infrastructure of centres of excellence and parallel laboratories	Measure 2.2. Support to companies engaged in RDI by financial tools ("Technostartas LT", "Koinvest LT")			
Measure 5.7. Development of information infrastructure for science and education (LITNET)	Measure 3.4. Support for attracting direct foreign investments in RDI area ("Smartinvest LT")			
Measure 5.9. Promoting activities of innovation and technology transmission centres of science and education institutions	Measure 3.5. Support for direct foreign investments in RDI area ("SmartInvest LT+")			
Measure 5.10. Ensurance of the doctoral study process; doctoral studies, trips, scholarship, R&D, transfer, funds for visits (including foreign doctoral students)	Measure 4.4. Promotion of commercialization of R&D activity results in science and education institutions			

Measure 5.12. Attracting and reintegrating scholars	Measure 5.20. To ensure funding for R&D activities relevant to the solution of top-level problems strategically important to the public and the state as well as economic development	Measure 1.3. Support for company RDI by providing innovation vouchers ("Inovaciniai čekiai")	-	Measure 3.3. Support for investments into a cluster ("InoKlaster LT+")
Measure 5.14. Promotion of internships after doctoral studies	Measure 3.2. Support for participating in international RDI initiatives ("InoConnect LT")			-
Measure 5.15. Preparation of specialists in smart specialization priority-related study programmes	Measure 5.13. Student R&D activities			
Measure 5.8. Attraction of foreign scientists and R&D activities		Measure 1.4. Support for patenting inventions and design ("InoPatentas LT")		
Measure 5.16. Development of science popularization system	-	Measure 4.3. Implementation of market-oriented research and business projects through the cross-border network		
Measure 5.17. Funding of undergraduate, graduate, integrated and non-degree studies		-		
Measure 5.18. Support for mobility of Lithuanian and foreign students and teachers				
Measure 5.19. Practical trainings for scientists and other researchers, participation of scientists and other researchers in targeted events of international programmes, participation of Lithuanian researchers in targeted meetings for the preparation of project applications, participation of representatives from Lithuania in the European Union and other international working groups, committees, commissions, related to research and experimental (socio-cultural) development. / Encouragement of participation in *H2020*				
Measure 5.21: To support cross-sectoral cooperation in R&D area				
Measure 5.22. To allow researchers to use digital scientific data resources				
Measure 4.1. Creation of the material base intended for the implementation of joint science and business projects and the development thereof in science and education institutions (creation and development of infrastructure of centres of excellence)				
Measure 4.2. Support for the implementation of RDI activities executed by centres of excellence				