

Project Application Form under the Recovery and Resilience Facility

1. Project name

Programme for acceleration of the recovery and transformation of the economy through science and innovation

2. Project description (goals, major activities).

Main challenges

According to the conclusion of the European Semester process, there is a number of structural shortcomings in the Bulgarian research and innovation system, which include “low levels of public and private R&I investments, fragmentation of the public science base, lack and ageing of skilled human resources, weak science-business links and inefficient governance of resources. All these shortcomings are an obstacle to the potential contribution of R&I to increasing productivity and economic growth and, therefore, in the medium term, they will significantly restrict the upward approximation capacity. Overcoming these difficulties would help Bulgaria achieve progress in attaining SDG 9: Industry, Innovation and Infrastructure. Currently Bulgaria is among the countries with the worst results (“modest innovator”) in the EU Innovation Scoreboard still with a total score of below 50% of the EU average.

According to the National Strategy for Development of Scientific Research(NSDSR), Bulgaria intends to gradually increase public spending on R&D. By 2025, it will reach 1% of GDP¹. In the period after 2017, the budget for the implementation of NSDSR has almost doubled and, still, the intensity of R&D (public and private spending in R&D) is growing slowly: 0.76%² of GDP, with public spending making up a mere 0.21%. The R&D intensity of enterprises (0.54% of GDP) has also been in a downward trend over the past years. EU Member States are committed to achieve this spending up to 3% of EU’s GDP. In 2020, the Commission reiterated³ its call to reaffirm this commitment and reach the target of 3% by 2030 with public spending reaching 1.25% of EU’s GDP of which 5% is to be allocated to joint cross-border programmes and European R&I partnerships.

In 2018, Bulgaria launched large-scale investments in R&D infrastructure and structuring of specialised units, building of laboratories, improvement of the overall environment in research organisations and higher education institutions (HEI) through investments in Centres of Excellence (CoE) and Centres of Competence (CoC) through Operational Programme Science and Education for Smart Growth 2014-2020 (OP SESG) and national budget funds from the National Roadmap for Research Infrastructure (NRRI). Laboratories were renovated and high-tech equipment was purchased. Prerequisites were created for work on targeted research in partnership between HEI, research organisations and leading business organisations in the country with clearer and transparent rules for the use of services, including access to infrastructure. However, the great challenges to the R&D and innovation ecosystem remain, such as fragmentation within and

¹ <http://www.strategy.bg/StrategicDocuments/View.aspx?lang=bg-BG&Id=1231>

² Data for 2018. Source: National Statistical Institute, *Statistical Reference Book 2020*, Sofia, 2020.

³ European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions “A new ERA for Research and Innovation” (COM/2020/628 final).

between research organisations, gradual loss of human resources and ineffective management and use of the results in terms of commercialisation.

The relatively small budget for research in the public sector is allocated between a large number of universities and research organisations. This results in insufficient quality of the Bulgarian scientific product (as the share of the Bulgarian research publications with the largest number of citations globally), whose level is low among all EU Member States, poor internationalisation and lack of potential contribution of R&I to boosting the competitiveness of the national economy, economic recovery and accelerating knowledge-based growth.

The key to implementing the structural reforms in the sector and strengthening their effect will be the new body for coordinating and encouraging innovation and applied research in Bulgaria – State Agency for Research and Innovation (SARI) – which will ensure a more stable management, commitment and improvement of the effectiveness and coordination of the functioning of the entire system.

A number of studies⁴ indicate that that increasing public investment in R&D also leads to increased private investment⁵. Therefore, factors of ever growing importance for the social and economic development and sustainability of the country, emerge as the possibility for cooperation among academia and the private sector, promotion of innovative SMEs, including start-ups, the development of the R&I ecosystem at a regional and national level, boosting its effectiveness and quality, among others. According to the *SME Strategy for a sustainable and digital Europe*,⁶ SMEs face particular difficulties in planning and implementing R&D investments, lack of highly qualified people and attracting talent, raising capital for growth and others.

The increase in investment in the overall R&I ecosystem, which lies at the foundation of dealing with the systemic challenges, is expected to result in accelerating the economic development at the regional and national levels, driven by beneficial and effective cooperation between academia and the private sector and ensuing increased innovation capacity of the Bulgarian enterprises. This will inevitably contribute to the twin transition by mobilization of private investment in the development and implementation of clean technologies, participation in strategic supply chains for clean industrial capacity (including in relation to the EU's strategic autonomy goals), in digitization, etc.

Last but not least, boosting the development and internationalisation of this sector is expected to lead to creation of jobs with a high added value to the economy in the mid- to long-term.

Given all of the above challenges, the **reform** in the R&D system to which this program will contribute is related to the implementation of a common policy for the development of research, innovation and technology through:

- Creating a structural framework for the implementation of the new policy through the establishment of the State Agency for Research and Innovation;
- Adoption of the necessary legal framework through the development and adoption of a Law on Research and Innovation;
- Improving the participation of stakeholders in the policy development and implementation process by establishing a scientific and innovation board at the State Agency for Research and Innovation and renewing the functions and role of the Smart Growth Council;
- Increasing the capacity of research organizations and universities to develop applied

⁴ What is the relationship between public and private investment in science, research and innovation, Economic Insight Ltd., London, 2015.

⁵ Largely because of the “leverage effect” and “crowd-in effect”.

⁶ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions “An SME Strategy for sustainable and digital Europe”, COM(2020) 103.

research and innovation; implementation of joint projects with industry by gradually increasing the share of project funding in the budget structure of public research organizations and universities. This will become a sustainable platform for the introduction of mechanisms for monitoring and evaluation of scientific and innovative activities for better planning, management and coordination of the scientific and innovative process, including management of the program and project cycle, thus gradually transition to a results-based funding model (performance-based);

- Strengthening the link between research and higher education and creating a national model for the development of research universities; and
- Increasing the capacity for technology transfer from research organizations to the private sector by developing a new model for technology transfer.

To implement the reforms, the programme links a series of investments in three pillars: the first one is aimed at accelerating the internationalization of the Bulgarian R&I system; the second one focuses on the creation and development of a network of research HEI in support of industry and society.

Description of activities

Pillar I: Strengthening research and innovation potential and accelerating the internationalization of Bulgaria's R&I system

The two operations in this pillar of the Program provide synergies with the EU Framework Program for Research and Innovation Horizon Europe (2021-2027) - the leading European initiative to support research and innovation across the EU. Their implementation aims to promote public and private investment in research and innovation, strengthen the transfer of research results and technologies and support internationalization, retain and attract highly qualified professionals, young scientists and talents in Bulgaria and increase the participation in European, international and national joint research and innovation programs and projects.

The activities in this pillar contribute to achieving the vision and main goal of NSDSR (2017 – 2030) and, in particular, Specific Objective 4⁷, Specific Objective 5⁸, Specific Objective 6⁹, Specific Objective 8¹⁰, Objective 9¹¹ and Objective 12¹² as well as the goals of NSDHE (2021 – 2027).

The synergy with the Framework Program is achieved in particular by financing the implementation of highly evaluated project proposals submitted by Bulgarian organizations - SMEs, universities and research organizations to the schemes of the European Innovation Council

⁷ Specific Objective 4: Develop, maintain and use modern research infrastructure which is balanced for thematic areas and regions and ensure the necessary access to European and international research infrastructure.

⁸ Specific Objective 5: Ensure sustainable recovery of the country's international positions in terms of quantity and quality of the internationally visible scientific product.

⁹ Specific Objective 6: Increase the quantity and quality of research related to problems of regional and national significance.

¹⁰ Specific Objective 8: Stimulate private investment in science.

¹¹ Specific Objective 9: Expand the participation of the Bulgarian research community in the European research space and grow the international research cooperation.

¹² Specific Objective 10: Intensify significantly the links of science with education, businesses, government authorities and society as a whole.

and on the topic of "Expanding the participation and dissemination of high scientific achievements", according to the work program of the Horizon Europe Framework Program.

The European Innovation Council supports the implementation of innovative projects by single beneficiaries - SMEs working on breakthrough and revolutionary innovations, creating new markets, their effective market penetration and the expansion of enterprises¹³ through grants. Their submission is based on the evaluation of project proposals submitted under the calls for proposals of the European Innovation Council.

The Spreading Excellence and Widening Participation Schemes of Horizon Europe target Member States with low research and innovation performance¹⁴, incl. Bulgaria, in order to strengthen links and cooperation across Europe, open the existing European networks in the field of research and innovation, contribute to improving the management capacity for research in these countries, utilization of the potential of talents throughout the Union and in general - increase the participation of organizations from these Member States in the calls for proposals under the Framework Program. This is achieved through targeted schemes that provide grants for the implementation of projects under specific calls for proposals, organized by the services of the European Commission.

Operation 1: Implementation of project proposals of innovative small and medium-sized enterprises (SMEs), awarded the quality label "Seal of Excellence"¹⁵ in the calls for proposals of the European Innovation Council

This mechanism, eligible under the Framework Program Regulation¹⁶ and implemented in many European countries, aims to provide national funding for the implementation of innovative project proposals of SMEs awarded the "Seal of Excellence" quality label by the European Innovation Council under Horizon Europe. This will contribute to the development of the Bulgarian innovation ecosystem, the growth of innovative enterprises, strengthening their capacity and introducing their innovative products and services on the market. The expected impact in the implementation of the Seal of Excellence is: increasing the innovative potential and capacity of Bulgarian businesses, keeping innovative start-ups in the market and supporting their scale-up, thus increasing the market share of Bulgarian enterprises in Europe and the world and Bulgaria's competitiveness in the Southeast Europe and Europe as a whole. In addition, an increase may be expected in the employment of highly qualified experts and research staff in the private sector in the country. Project proposals, implemented with the support of national schemes/programs that have received a "Seal of Excellence" have access to the advisory services of the European Innovation Council.

¹³ Art. 43 of the Proposal for a Regulation establishing the Horizon Europe Framework Program

¹⁴ Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia

¹⁵ Съгл. чл. 2(19) от предложението за Регламент за създаване на „Хоризонт Европа“ „печат за високи постижения“ означава сертифициран знак, който показва, че дадено предложение, представено по покана за предложения, е надхвърлило всички прагове за оценка, определени в работната програма, но не е могло да бъде финансирано, тъй като в работната програма няма наличен бюджет за тази покана, но което може да получи подкрепа от други източници на финансиране от Съюза или на национално равнище

¹⁶ Art. 11 of the proposal for a Regulation establishing Horizon Europe

According to the work program of Horizon Europe the costs of the following activities are eligible: innovation activities, incl. demonstration of the technology in the respective environment, prototyping and demonstration at system level, research and development, intellectual property management, etc.

According to the databases of the European Commission - in the competition sessions in the period 2018 - 2020 under the same Horizon 2020 scheme, Seal of Excellence was awarded to 17 project proposals submitted by Bulgarian SMEs with a total budget of EUR 27.2 million, of which 9 project proposals will be financed in amount of BGN 28.08 million.

On the basis of data provided by the Commission - the number of project proposals in the coming years that would received a "Seal of Excellence" can be estimated with an upward trend with respective estimated funding for a total of 28 projects in amount of BGN 87,36 million.

The duration of the projects is up to 24 months.

Operation 2: Implementation of project proposals on the Horizon Europe thematic topic Widening participation in order to strengthen the research and innovation capacity of Bulgarian public universities and research organizations

The Operation aims to provide funding for Bulgarian project proposals submitted by Bulgarian universities and research organisations that exceeded the funding thresholds, but did not receive any European funding due to budgetary constraints under the component Widening participation and spreading excellence of the European Framework Programme for Research and Innovation "Horizon Europe". This support will help increase public investment in R&I based on competition. This will contribute to increasing the competitiveness of the respective Bulgarian universities and research organizations and their internationalization. The operation covers the following two schemes:

- **Twinning** which finances the establishment of close links between Bulgarian HEIs / Research organisations and at least two leading world-class research institutions from other countries in order to significantly strengthen the Bulgarian scientific capacity in the relevant field of science. The implementation of such projects is expected to lead to:
 - Improved scientific capacity in the organization;
 - Accelerating the international scientific activity of the organization;
 - Increasing the reputation, international profile and attractiveness of the organization and the research team;
 - Strengthening the capacity for project management and increasing the skills of the administrative staff in the implementation of European projects;
 - Implementation of good practices, improved internal and external mobility of researchers.

The projects have a budget of BGN 2.93 million and a duration of 36 months. The Commission is expected to hold competition calls in 2021 and 2022. Eligible costs under such calls cover: management, networking, coordination, training, mobility, as well as research, consumables and small equipment (the latter - up to 30% of the total project budget).

- **European Research Area (ERA) Chairs** to support the respective HEI and research

organisations to attract and retain leading researchers who will support the implement structural changes in the respective university or research organisation, reversing the “brain drain”.

The implementation of the projects is expected to lead to:

- Improved scientific capacity in the organization;
- Increasing the reputation, international profile and attractiveness of the organization and the research team;
- Establishment of a research team in the relevant scientific field;
- Improving the possibility for successful participation in European project calls for proposals.

The projects have a budget of BGN 4.88 million and a duration of 60 months. The Commission is scheduled to hold a competition session in 2021. Eligible costs under such projects cover: hiring, salaries, management, mobility, training, publishing, research (up to 10% of the total project budget), etc., whereas the costs related to the infrastructure are not eligible.

Based on the data provided by the Commission, the number of Bulgarian project proposals in the coming years which could score above the thresholds, is expected to rise. Respectively, the Twinning scheme is expected to finance the implementation of a total of 10 projects with a total value of BGN 29.3 million. The ERA Chairs scheme is expected to finance the implementation of a total of 2 projects with a budget of BGN 9.77 million.

The grant is awarded to the Bulgarian organization that coordinates the project. Project proposals submitted by Bulgarian research organizations that are eligible for national funding must have received high marks during the process of evaluation by the European Commission. Eligible institutions are: (1) institutes or academic specialized units of the Bulgarian Academy of Sciences and the Agricultural Academy and others falling under the regulation of Art. 60 of the Law on Administration and Scientific Organizations, as defined in the Law for Promotion of Scientific Research; (2) Higher education schools and/or their basic units (as stated in art. 25, para. 2 of the Higher Education Act).

Operations under Pillar 1 will be carried out by SARI, as follows:

Activity	Year of implementation	Project proposals (number)	Budget of the project (BGN million)	Обща стойност (млн. лв.)
Support for innovative SMEs	2021	9	3,12	28,08
	2022	9	3,12	28,08
	2023	10	3,12	31,20
Implementation of TWINNING projects	2022	5	2,93	14,65
	2023	5	2,93	14,65
Implementation of ERA Chairs projects	2022	2	4,88	9,76
Total:				126,42

In case there is a larger number of project proposals that have received a "Seal of Excellence" (under the scheme/program "Support for Innovative SMEs") or a score "above the thresholds" (under the program/scheme "TWINNING" and "ERA Chairs") – the projects in the field of green technologies and digital technologies will be supported by priority. These and other requirements

will be specified explicitly in the relevant guidelines.

The abovementioned operations will be carried out by SARI. By designating SARI as the organization responsible for coordinating the implementation of Horizon Europe for Bulgaria, SARI will have full access to the European Commission databases. The expenditure set for the operational programs for Technical Assistance/Organization and Management is up to 10% of the total project costs. The provision of technical assistance will ensure the effective implementation of operations and refers to the support for the organization and its management by SARI.

The implementation of these programs at national level will increase the level of participation and success of Bulgarian organizations in Horizon Europe. The high quality of the projects is guaranteed by the high evaluation given by the European Commission, expressed in the "Seal of Excellence" (for SMEs) of the European Innovation Council i.e. "above the thresholds" under "Twinning" and "ERA Chairs. " The Ministry of Education and Science has gained experience through the implementation of the national scientific programs "Peter Beron and SEU", "VIHREN" and "European Scientific Networks"¹⁷, the latter of which implemented the "Twinning" scheme with national funds in the period 2019-2020 and in the case of national co-financing of projects under FP "Horizon 2020" through OP SESG.

Pillar II: Establishing of a network of research HEI in Bulgaria

The purpose of this pillar is to create and test a national model for the development of research universities, which will allow HEI to transition to the next level in their development and turn into beneficial participants in the R&I ecosystem through:

- 1.) using and strengthening the R&D capacity and preparing highly qualified and fulfilled talent, contributing to generating new knowledge, developing innovation and competitive technology; Sharing of research infrastructure between HEIs, BAS and the Agricultural Academy;
- 2.) strengthening the connection with industry and engendering and disseminating a spirit of entrepreneurship, creating sustainable links with businesses to introduce innovation in industry or to create new products, services and technology as well as to resolve jointly global, social and technological challenges; and
- 3.) developing and enhancing the quality and specialisation of research, including by creating topical coalitions among them to share resources and knowledge in response to the needs of the economy.

Over the past years, the reform in the area of higher education has been exclusively oriented to recovering its capacity to produce professionals with the necessary knowledge and skills for the labour market, as well as to improve curricula and processes. Opportunities have been created to update and increase the competences of lecturers in view of the contemporary requirements and the digital transformation of education. Management agreements with the individual HEI have laid down requirements related to improving qualitative and quantitative indicators, including encouraging your scientists and business experts in the activities HEI carry out. A National Roadmap of Higher Education is currently being developed, which will contribute to optimising the system and boosting the results achieved.

The next stage of reforms began in view of transforming higher education and research into the main driver of a knowledge-based economy, in partnership with businesses and research organisations in the country such as the Bulgarian Academy of Sciences, the Agricultural Academy and others. Stimulating and accelerating the process of development and

¹⁷ The National Program "European Scientific Networks" was approved by Decision № 557 of 06.08.2020 of the Council of Ministers and is implemented in the period 2020 - 2022.

implementation of innovation in individual sectors of the economy are priority goals in the National Development Programme Bulgaria 2030 and of the Strategy for Development of Higher Education for the period 2021 – 2030. An Act to Amend the Higher Education Act was adopted in the beginning of 2020¹⁸, as well as Regulations on the terms and procedure for HEI to set up commercial companies for the purposes of economic use of research results and items of intellectual property¹⁹.

The activities envisaged in Pillar II will also be facilitated by the amendments to the Higher Education Act adopted in 2020, which are aimed at allowing HEI with a significant contribution to the development of important social areas through research of excellence and with good R&D results to be designated a research HEI. Pursuant to the Higher Education Act²⁰, a “research HEI” is a “HEI, which makes a significant contribution to the development of important social areas through research of excellence and which has high R&D results, assessed in line with objective indicators [...] set out in an act of the Council of Ministers.”

The current discussion about the future of research universities, outlines the following characteristics as central to the model of research HEI:

- High level of R&D which attracts national and international researchers and talent;
- Broad range of academic programmes and post-graduate qualification programmes with academic level teaching and development of skills related or research activities;
- Well-developed sector specialisation;
- Adequate funding with a substantial share of external funding;
- Modern infrastructure and facilities which inspire students and researchers to generate and develop creative ideas;
- Structured partnership with industry accompanied by intense patent activities and a serious share of applied research, including creation of start-ups and spin-offs;
- Autonomy and freedom to be innovative and change;
- International activities and internationalisation – making science ever more open and sharing resources and knowledge.

The vision for the implementation of this initiative entails structural reforms in the sector, including in relation to the public funding for HEI activities, the structure and organisation of the respective HEI, the services they offer and partnerships with the private sector and other elements, which will be supported and encouraged through this programme. It is envisaged that the testing of this funding model will result in changes in the state budget funding for higher education with research HEI receiving as subsidy for R&D activities amounting to 40% of the one for training. The other HEI will receive up to 10% for this purpose. By increasing the funds for R&D activities of research HEI, in line with the goals set in the NSDSR, the sustainability of the programme will contribute to an overall increase in public spending for R&D.

The programme also envisages the creation and functioning of a network of research HEI based on an internationally acclaimed model and practice of such collaboration. The idea behind functioning in a network is to share uniform work quality standards and best practice as well as resource management. This is a leading factor in the reform of the R&I system in the country as well as to increase the effectiveness of public spending by introducing specific methodologies to assess the added value and the impact of HEI to improve the overall social and economic ecosystem in Bulgaria.

Building and next supporting HEI and their network aim to ensure the necessary conditions to boost their participation in international, European and national programmes, including FP

¹⁸ Adopted on 13 February 2020, promulgated in the State Gazette, issue 17/2020.

¹⁹ Decree No. 61 of the Council of Ministers of 2 April 2020.

²⁰ Article 17a HEA (amended, State Gazette, issue 17 of 25 February 2020).

Horizon Europe, as well as jointly with other Bulgarian leading HEI and research organisations and enterprises and other organisations, and to increase the attractiveness of the R&I system as a whole, including through cooperation with established scientists and organisations from all over the world in order to boost the internationalisation of Bulgarian science. The strengthening of research HEI will contribute to implementing and unlocking the research and economic potential of the respective regions and the country as a whole. In particular, through a funding policy based on outputs, conditions will be established to attract private investments in R&I, and in this way, HEI will participate actively in the creation of high added value for the Bulgarian economy.

A key element of the reform and strengthening the model of research universities will be the partnership between academia and industry where a balance will be sought between short-term and long-term partnership, from technology transfer to resolving global and regional technological and social challenges. For the first time, businesses will be allowed systemic access to research capacity and researchers throughout the entire innovation process.

The establishment of a network of research universities will include 7 predefined HEIs, determined on the basis of the criteria set out in the Higher Education Act. These universities will be divided into two groups based on these criteria:

- Group 1 (3 universities) with funding from the program in amount of BGN 40 million per university for the entire period of the program
- Group 2 (4 universities) with funding from the program in amount of BGN 16 million per university for the entire period of the program.

Each of these higher education institutions presents for independent evaluation its strategic innovation development programs aimed at achieving the goals and indicators described above.

The activities of the program will be organized in two groups and will be implemented as follows:

Activities at national level - administration of the program (implemented by SARI):

Establishing, coordinating and monitoring the network of research HEIs and the implementation of the program, as well as promoting its results.

Activities at institutional level - Research university - implementation of the Strategic Program for Development of Research and Innovation.

At national level, the following activities will be carried out by the State Agency for Research and Innovation as a coordinating unit in close cooperation with the Ministry of Education and Science:

1A. Establishing of a network of research HEI and monitoring of their strategic research and innovation programs	Total budget 7 500 000 BGN
- Elaboration of Guidelines for the preparation and implementation of the HEIs' R&I programs;	2 000 000 BGN

<ul style="list-style-type: none"> - Announcement of the procedure for the elaboration and evaluation of the research HEIs' programs for the development of applied research and innovation; - Setting up a Committee for the evaluation of the program proposals submitted by the HEIs; - Setting up a Monitoring and Evaluation Committee for the implementation of the programs at national level; - Preparation and conclusion of the contracts with the HEIs; - Monitoring of the implementation of the HEIs' programs – provision of an interim and final evaluation of the programs implementation; - Release of the periodic tranches by the EC (every 6 months) and payments to the contractors according to the achieved results; - Introduction of a single information portal, including a system for monitoring and evaluation of the scientific and innovation activity of the funded HEIs for better planning, management and coordination of the scientific and innovation process, including management of the program and project cycle and the activity of all supported scientific institutions; 		
1B. Information and communication activities at national level in support of the activities of the network of research HEIs		
<ul style="list-style-type: none"> - Organising and holding of three major public events – a launch event, an event for reporting the progress of activities and exchange of experience between contractors and an event for reporting the results of the activities. - Organisation of an international forum with representatives from the EC and partner countries to present the results and prospects for sustainable development of the programs in the context of the European Innovation and Research Area. - Organisation of annual national meetings “science-business-education” to discuss opportunities for cooperation and to determine the strategic directions for the development of research organizations and six regional meetings - Elaboration of two analytical reports on the activities of the network in the middle and at end of the program with recommendations for its future development. 	5 500 000 BGN.	
The activities of the Research HEI for the implementation of the Strategic Program for Development of Applied Research and Innovation are envisaged to include:		
A. Management and Monitoring	<i>Per one HEI from Group 1</i>	<i>Per one HEI from Group 2</i>
A. 1 Program planning, coordination of the activities, monitoring of the implementation and reporting <ul style="list-style-type: none"> - Steering Committee of the Program - Advisory board consisting of international partners and representatives from Bulgarian business 	1 500 000 BGN	400 000 BGN

<ul style="list-style-type: none"> - Annual round tables to discuss the implementation of the program and the strategic development of HEI - Communication and promotion of the program. 		
A. 2 Administrative and accounting activities	2 000 000 BGN (5% of the total amount)	800 000 BGN (5% of the total amount)
<i>B. HEI-industry relations and commercialization of research results</i>		
B.1 Intellectual Property Protection and Technology Transfer Program		
<ul style="list-style-type: none"> - Stabilization and expansion of the activities of technology transfer centres/offices (TTC/TTO) 	850 000 BGN	510 000 BGN
<ul style="list-style-type: none"> - Setting up an office/unit for intellectual property protection and legal aid 	500 000 BGN	170 000 BGN
<ul style="list-style-type: none"> - Financing the inherent costs of filing international patent applications 	600 000 BGN (10 patents)	240 000 BGN (4 patents)
<ul style="list-style-type: none"> - Trainings on intellectual property, commercialization, etc. 	20 000 BGN (4 courses)	10 000 BGN (2 courses)
<ul style="list-style-type: none"> - Provision of expert assistance in the preparation of a business plan, intellectual property protection, etc. 	300 000 BGN (30 units)	100 000 BGN (10 units)
B.2 Industrial Relations Program		
<ul style="list-style-type: none"> - Organisation of seminars and meetings with companies interested in joint research and innovation 	10 000 BGN (20 units)	5 000 BGN (10 units)
<ul style="list-style-type: none"> - Meetings with potential investors and other accompanying activities to secure investments 	10 000 BGN (20 units)	5 000 BGN (10 units)
<ul style="list-style-type: none"> - Creation of a database with information about the scientific competencies of the scientific groups in strategic areas and proposals for innovations as a component of the single Portal. 	20 000 BGN	10 000 BGN
B.3 Program to prepare and support start-ups in HEIs , determined on the basis of a preliminary expert assessment of their business plan	1 500 000 BGN An average of 150 000 BGN (10 start-ups) (such as the initiative of Sofia Municipality 'Startup Sofia Accelerator')	750 000 BGN An average of 150 000 BGN (5 start-ups)
<i>C. Increasing the scientific capacity for applied research and innovation</i>		
C.1 Program for attracting lead researchers		
<ul style="list-style-type: none"> - Attracting lead researchers/industry experts from abroad and within the country to work in the strategic areas of the HEI with task to create a research group 	7 500 000 BGN 5 groups of 1.5 million BGN each (max. value according to Vihren Program)	3 000 000 BGN 2 groups of 1.5 million BGN each (max. value according to Vihren Program)

C.2 Program for international cooperation in the strategic areas of the HEI <ul style="list-style-type: none"> - Visits of researchers from the HEI to organizations or companies abroad and of international researchers/experts to the HEIs to realise cooperation (up to 2 weeks) - Short-term specialisations abroad (up to 3 months) - Participation of HEI's researchers in conferences, seminars, etc. (scientific or in the relevant industrial field) - Organisation of international conferences and schools 	5 000 000 BGN 5 programs of 1 million each BGN (max. value according to the European networks schemes)	1 000 000 BGN 2 programs of 0.5 million BGN each (smaller number of participants)
<i>D. Conduct of research and innovation development focused on the HEI's strategic areas of development and research</i>		
D.1 Program for basic and applied research aimed at the strategic areas of the HEI Funding of basic and applied research aimed at the strategic areas of the HEI conducted by scientific groups of researchers (principal investigator), who are leaders in the respective scientific field and greatly contribute to the definition of the HEI as a research one. The program provides funding for: <ul style="list-style-type: none"> - the provision of the necessary conditions for conduct of research and innovation (premises, equipment, materials, analyses, etc.) - remuneration of the staff in the research group and improving their qualifications (including for employment of PhDs, post-docs, senior associates; long-term specializations, etc., training of experts for the industry) - dissemination of results (participation in international networks, cooperation, scientific publications, participation in and organization of international conferences, patent protection, etc.) 	12 000 000 BGN 10 groups of 1.2 million BGN each (max. value according to Vihren Program)	6 000 000 BGN 5 groups of 1.2 million BGN each (max. value according to Vihren Program)
D.2 Program for the development of innovation leading to intellectual property Implementation of innovative applied research projects (for 2 years), aimed specifically at obtaining results necessary for the protection of intellectual property. The program provides funding for: <ul style="list-style-type: none"> - the provision of the necessary conditions for conduct of research and innovation (premises, equipment, materials, etc.) - remuneration of staff for their work in the research group 	6 200 000 BGN 31 projects of 200,000 BGN each (ERA-Net projects)	2 000 000 BGN 10 projects of 200,000 BGN each
D.3 Innovation development program in cooperation with companies Implementation of innovative applied research projects (for 2 years) on topics requested by the industry, as well as for capacity building and training of qualified scientific personnel to work in the industry. The program provides funding for: <ul style="list-style-type: none"> - the provision of the necessary conditions for conduct of research and innovation (premises, equipment, materials, etc.) - remuneration of staff for their work in the research group, attracting young researchers - dissemination of results. 	2 000 000 BGN 10 projects of 200,000 BGN each (ERA-Net projects)	1 000 000 BGN 5 projects of 200,000 BGN each

Indicators for the evaluation of results from the implementation of the Strategic Programs for Development of Applied Research and Innovation by HEIs

Criteria	Source/proof	Target value
Research quality in the proposed sectoral specialization	Web of Science	Increase in the number of publications by 20% at the end of the period on an annual basis compared to 2020. Increase in the number of citations by 20% at the end of the period on an annual basis compared to 2020
Patent activity and applied developments	Patent information	10 new international patent applications for HEIs - group 1 and 5 new international patent applications for HEIs - group 2 for the entire duration of the program
High qualification of the staff in the areas of the sector specialization	Program report	Number of lead researchers funded by the program for the creation or development of research groups: 15 for HEIs - group 1 and 7 for HEIs - group 2 for the entire duration of the program
Attracting young researchers and improving their qualifications for conduct of applied research	Program report	Number of young researchers participating in research funded by the program: 30 for HEIs - group 1 and 10 for HEIs - group 2
Attracted external funding and industrial support	Signed agreements with the industry	10 per HEI-1 и 5 per HEI-2
International activity and participation in networks	Signed international agreements during the program implementation	10 per HEI-1 и 5 per HEI-2

The implementation of the program aims to achieve the following results:

1. Internal:

1.1. Organisational and management component – e.g. building an effective structure in order to create, implement innovation and commercialise research and technical knowledge. Establishing effective links between the HEI units to apply its innovation strategy. Timely adaptation of the staff to developing and commercialising innovation. Ensuring effective planning and allocation of financial resources.

1.2. Information and methodology component – development of an automated management system covering the university educational, research and innovative activities. Development and application of methodological materials for improving the qualification of the staff in terms of business management, entrepreneurship and

intellectual property. This information should be integrated into the single information system planned for construction and deployment within the same pillar.

1.3. Intellectual component – availability of highly-qualified staff able to develop and implement new research as well as to manage it. Creation of an active mechanism to stimulate intellectual work and motivate staff to be committed to the HEI and the research the HEI conducts which implies changes in the internal rules of the university and other Regulations related to career development in higher education.

1.4. Research component – this represents applied projects between HEIs and the business, along with a portfolio of patents, licences, know-how and other items of intellectual property. It also includes material and technical support needed for R&D and the implementation of the teaching process. It will all be determined by the integrating appropriate pathways to develop the staff. This component also includes ensuring the necessary technology and high profits from the status of exclusive property during technology transfer. Hence, this means a requirement for a competitive position of different markets: educational services, high-tech products and other services.

1.5 Production and technology component – it includes the availability of production and technology support needed for the production of high-tech products and services (technology, equipment, tools, etc.). It is responsible for operational market studies and the development of effective marketing strategies. The quantitative and qualitative characteristics of this potential exert a significant impact on the competitiveness of a research HEI as a whole.

1.6. Financial component – a component, which ensures the availability of financial resources for the needs of effective innovation implementation. It is carried out through funding of: 1) costs needed to set up and maintain the innovation infrastructure; 2) encouraging the processes of preparation and exchange of highly qualified staff; 3) funding needed to improve the production of high-tech products and services; 4) encouraging marketing studies of new markets.

1.7. Marketing component – a key component, which includes the availability of opportunities to apply effective marketing tools to implement and popularise revolutionary new developments (high-tech marketing). This will be achieved through: results of research, development and adaptation of strategies and effective marketing campaign.

2. External:

2.1. Global, European, regional and local innovation networks – systematised organised groups, which motivate their participants to make innovations by achieving results in jointly defined long-term projects and areas.

2.2. Research laboratories of cross-border corporations – the university has access to data and technology of a corporate structure to be able to formulate the technical assignment correctly and to increase the effectiveness of its implementation.

2.3. Research unions and organisations – by uniting the efforts, they allow for solutions to industrial problems. It helps to increase the growth rates of the science intense market of services which, on its part, results in the emergence of new niches which increase the share of the innovative products already in existence.

2.4. International consortia – provide access to financial resources, equipment, unique

specialists and technology.

3. Beneficiary.

State Agency for Research and Innovation

4. Timetable for implementation of the project, including activities and stages ²¹.

Period of implantation of the activity : 60 months /

Appendix 2

4.1. When can the implementation of the project start at the earliest after its approval?

Activities under all elements of the Programme can start immediately after its approval.

The indicative start of the activities by pillars is as follows:

Pillar 1: 2021

Pillar 2: 2021

5. Indicative financial resource by activities, incl. sources of funding (State budget, European funding, private funding, IFIs).

Activity	National funding BGN	EU funding BGN	Private funding BGN	International financial instruments BGN	Total BGN
Pillar 1					
Activity 1		87 360 000			87 360 000
Activity 2		39 060 000			39 060 000
Total		126 420 000			126 420 000
Pillar 2					
Activity 1		7 580 000			7 580 000
Activity 2		184 000 000			184 000 000
Total		191 580 000			191 580 000
Total for the Program					318 000 000

Sorting the six-month negotiated financial resources for Pillar 1 and 2 (BGN/thousands)

²¹ The timetable will be relevant for setting intermediate targets under the Recovery and Resilience Plan and is directly related to the release of tranches of financial support from the Recovery and Resilience Fund.

Activities	Semester/total	1	2	3	4	5	6	7	8
Total for Pillar 1	126420	0	0	80570	0	14650	31200	0	0
Support for innovative SMEs - 1	28 080	0	0	28080	0	0	0	0	0
Support for innovative SMEs - 2	28080	0	0	28080	0	0	0	0	0
Support for innovative SMEs -3	31200	0	0	0	0	0	31200	0	0
Twining - 1	14650	0	0	14650	0	0	0	0	0
Twining - 2	14650	0	0	0	0	14650	0	0	0
ERA Chairs	9760	0	0	9760	0	0	0	0	0
Total for Pillar 2	191 580	0	0	34 800	44 710	55 295	56 775	0	0
Activity 1	7 580	0	0	1080	4 050	1600	850	0	0
A	2 000	0	0	550	450	500	500	0	0
B	5 580	0	0	530	3 600	1100	350	0	0
Activity 2	184 000	0	0	32 750	42 880	53 695	54 675	0	0
A.1	7 780	0	0	1900	2 000	1800	2080	0	0
A.2	9 200	0	0	2 400	2 200	2 200	2 400	0	0
B.1	10 850	0	0	2 400	2 140	3 155	3 155	0	0
B.2	170	0	0	50	40	40	40	0	0
B.3	7 500	0	0	0	2 500	2 500	2 500	0	0
C.1	34 500	0	0	5 000	8 000	10 500	11 000	0	0
C.2	20 600	0	0	3 600	5 500	6 000	5 500	0	0
D.1	55 200	0	0	10 700	12 500	16 000	16 000	0	0
D.2	28 200	0	0	5 200	7 000	8 000	8 000	0	0
D.3	10 000	0	0	1 500	2 000	3 000	3 500	0	0

Additional justification for the financial resources under Pillar 1 and 2 is given in Appendix 1.

5.1. Indicative allocation of the financial resource according to the type of expenditure:

FIRST PILLAR: Strengthening the research and innovation potential and accelerating the internationalization of the national innovation ecosystem

Operation 1:

Implementation of 28 innovative projects - BGN 87,360,000.

- Construction/rehabilitation of infrastructure (construction and installation work) - indicatively 10%
- Assets (purchase of machinery and equipment) - indicatively 25%
- Human capital (skills development, retraining, etc.) - indicatively 30%
- Labor (labor costs, consultancy services, etc.) - indicatively 5%

- Technology (costs for acquisition of NMLA - patents, software, etc.) - indicatively 30%.

Operation 2:

Implementation of 12 projects - BGN 39,060,000.

- Fixed tangible and intangible assets (purchase of machinery, equipment, scientific equipment, costs for registration of IP, software) - indicatively 24%;
- Labor (remuneration, consultancy services, coordination, administrative, financial and scientific management) - indicatively - 20%;
- Human capital (skills development, retraining, training and internships including workshops, qualification courses, mobility abroad, visits of foreign lecturers and doctoral students in Bulgaria - indicatively - 50%;
- Dissemination of results / visibility - website, logo, conferences - indicatively - 5%;
- Consumables and audit - indicatively - 1%

Second pillar: Establishment of a network of research universities in Bulgaria

Implementation of 7 projects - BGN 184,000,000.

- Construction / rehabilitation of infrastructure (construction and installation works) - indicatively - 10%
- Fixed tangible and intangible assets (purchase of machinery, equipment, scientific equipment, costs for registration of IP, software), indicatively - 18%;
- Labor (remuneration, external services, coordination, administrative, financial and scientific management, audit) - indicatively - 10%;
- Start-up companies - indicatively - 5%
- Increasing the capacity of the Human Capital (hiring researchers, improving skills, retraining, training and internships, including workshops, training courses, mobility abroad, visits of foreign lecturers and PhD students to Bulgaria - indicatively - 52%;
- Dissemination of results / visibility - website, logo, conferences, publications - indicatively - 5%;

Technical assistance - BGN 7,580,000.

6. Output indicator(s)

Pillar 1:

Indicator	Value
Signed agreements for implementation of innovative projects by SMEs	28
Leading national and foreign researchers/experts attracted to work in Bulgaria	28
Implemented programs for international cooperation	23
Signed agreements for implementation of projects by HEIs/RO	12
Implemented projects for development of innovations leading to intellectual property	28
Trainings completed	50
Share of successful project proposals in the competition calls of Horizon Europe in relation to the total number of eligible proposals	12.5%

Pillar 2: indicators for monitoring the results under funded contracts with HEIs

Indicator	Value
Supported technology transfer centers/offices (TTC/ TTO)	7

Established office/unit for protection of intellectual property and legal aid	7
Applications for registration of international patents	46
Conducted courses in intellectual property and commercialization	20
Common database with information on the scientific competencies of the research groups in the strategic areas and proposals for innovations	1
Established and functioning start-up companies at the university at the end of the period	25
Attracted leading researchers /experts from the industry (from Bulgaria and abroad) in the strategic areas for HEIs with the purpose of establishing a research group	23
Implemented programs for international cooperation in strategic areas	23
Implemented programs of leading researchers in the strategic areas of higher education	50
Implemented projects for the development of innovations leading to intellectual property	133
Implemented projects for innovation development in cooperation with companies	50
Business co-financing of public R&D expenditure,% of EU average (EC)	47

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6.1. Indicators for impact

<i>Output indicator</i>	<i>Base value</i>	<i>Year</i>	<i>Interim value</i>	<i>Year</i>	<i>Final value</i>	<i>Year</i>
Pillar 1						
European funds attracted (net) as a share of Horizon Europe (EC) funds	0,26%	2020	0.35%	2023	0.5%	2026
Share of signed grant agreements (EC)	1,95% (equal to 552 agreements)	2020	1.5%	2023	2.5 %	2026
Increase in the share of the International joint scientific publications out of the total number for the country (WoS, SCOPUS)	0	2020	5%	2023	10%	2026
Pillar 2						

Number of the employed researchers in the strategic areas of the HEIs*	0	2018	10	2023	23	2026
Share of cited publications (%) (WoS)	35.2	2020	45	2023	50	2026
Adoption of a new legal research and innovation framework	0	2020	1	2023	2	2026

*The indicator will be monitored through the annual reports of the HEIs (approved by the Academic Board of the HEI) with annexed documentary evidence.

7. Does the implementation of the project require a procedure under the Public Procurement Act?

A procedure under the Public Procurement Act under Pillar 2 of the Programme is required - in particular for the purchase of an electronic system for management, monitoring and evaluation of the project, programme and policy cycle.

7.1. If a procedure under the Public Procurement Act is required, what part of the activities and financial resources will be the subject of the public procurement?

BGN 7,580,000

7.2. If a procedure under the Public Procurement Act is required, what is the indicative schedule for its implementation?

180 days for preparation and implementation of public procurement (PP), incl. 60 days for preparation of TC and documentation, 30 days for collection of offers, 30 days for work of the evaluation commission, 15 days for the term for appeal to expire, 30 days for concluding a contract, 15 days of unforeseen delays (questions to the participants, etc.)
540 days for execution of a contract under OP

8. Demarcation and complementarity.

8.1. If similar projects have been implemented (regardless of their source of funding), describe how this project builds on/complements what has been achieved with previous projects.

The interventions envisaged in the Programme complement the national programmes supporting the development of the research and innovation ecosystem.
The activities under Pillar 1 related to ensuring national co-financing of projects of enterprises that have received a seal of excellence will be complemented by the activities to support innovation in enterprises foreseen in the National Innovation Fund programme. The same applies to the activities related to their digitalisation and successful participation in Industry 4.0. The activities aimed at internationalisation of

the activity of the research organisations and HEIs will be complemented with the programmes for development of their scientific capacity, financed by the Research Fund.

The activities under Pillar 2 related to the creation of a network of research HEIs are a concept that was partially probed in the BG051PO001/3.3-05-001 "Science and Business" project within the Human Resources Development Operation Programme (2007-2013), co-funded by the European Social Fund. The main goal of this project was to provide a favourable environment for the pro-active interaction between science and business, and to support the set-up of pro-active and sustainable partnerships between the main components of the "knowledge triangle" aiming to update the curricula. The support provided is for one-month trainings abroad for doctoral candidates, post-doctoral candidates and young researchers to work with high-tech complexes and products, which is an important step towards building a new generation of scientists meeting the needs of business.

At the same time, the Government of the Republic of Bulgaria recognises the need to create policies and programmes aimed at increasing excellence in research, consolidation of human resources and shared use of scientific infrastructure. As a result, public R&D spending has been gradually increasing in recent years. The research and artistic activity in the state HEIs is financed depending on the evaluation of the scientific or artistic activity. Thus, a new model for providing funds for research activities to state HEIs was introduced and the amount is determined by the achieved scientific results or artistic achievements, measured by scientometric indicators and indicators of artistic achievements - number of publications in international databases, citations, monographs, patents, as well as the number of films, exhibitions, concerts, etc. Due to the transparent, fair and efficient allocation and management of public funds, competition has intensified and the quality of research in the state higher schools is constantly increasing, including their establishment as scientific centres. In 2018, the Government of the Republic of Bulgaria approved 12 national research programmes, which will be implemented by HEIs and scientific organisations, which demonstrate highest achievements in the respective field for the period 2018-2023. The implementation of these programmes aims to overcome the fragmentation of the research system, to consolidate research potential, expanding the use of already built research infrastructure and concentrating of financial resources to address society challenges. The research programmes aim to fund research activities in the following scientific fields: climate, water resources, natural disasters, ICT, e-health technologies, development and implementation of a methodology for testing donated blood, healthy food and biotechnology, low-carbon energy sources, etc. The implementation of these programmes generates a technological advantage in the priority sectors, consolidates the existing capacity to overcome the fragmentation of the research system, consolidates the research potential in the respective field and jointly uses the scientific infrastructure. As a final result, important problems for the society are solved. As a result of the provided funding under the National Programmes for Top Research and People for the Development of European Science (Vihren) and Peter Beron and Science and Innovation in Europe (Peter Beron and SIE), 27 projects were funded at national level, receiving high marks for scientific quality in competitions of the European Scientific Council and the Marie-Skłodowska Curie Programme of the Framework Programme for Research and Innovation of the EC "Horizon 2020" or have applied at national level and were highly rated by foreign evaluators. This provides an opportunity for the accumulation of experience on the part of the beneficiary organisations for active attraction of leading researchers from Europe in Bulgaria. The National Programme "European Scientific Networks" provides national funding for the implementation of project proposals, which have been highly evaluated by independent experts at the European Commission but represent unfunded project proposals of Bulgarian scientific organisations and universities. 12 HEIs and scientific organisations were funded in

2020. The main result is the modernisation of programmes and models for training and career development of scientists, work on joint research programmes with European partners and building sustainable staff exchange so as to further expand the network and ensure joint diplomas and institutional networks. In this way, long-term integration and reintegration of high-quality scientists in Bulgarian scientific and scientific-educational institutions is achieved, knowledge is transferred and the quality of higher education in Bulgaria is indirectly improved.

Since 2014, the Operational Programme “Science and Education for Smart Growth” 2014-2020 has been launched. It has a total budget of BGN 1,271,383,550 (European and national funding) and is one of the main instruments for implementing the Government Management Programme of the Republic of Bulgaria for the period 2017-2021.

The actions supported under Priority Axis 1 “Research and Technological Development” of the OP SESG aim to increase the level and the market orientation of the research activities of the leading HEIs and scientific organisations in Bulgaria. Based on the identified deficits, including the need to overcome the shortage of competitive and internationally recognised research institutions meeting the requirements for a modern scientific infrastructure and a high level of research, as well as the planned measures of the National Strategy for Development of Scientific Research (NSDSR), according to the priority areas of the Innovation Strategy for Smart Specialisation, OP SESG invests during the current programming period in the establishment and development of COEs and CCs.

With the financial support of ERDF and the OP SESG, 6 COEs and 10 CCs are being currently established in Bulgaria, covering 62 research organisations, which include 26 institutes of the Bulgarian Academy of Sciences (BAS), the Agricultural Academy, 23 HEIs, etc., with a total of over 1200 scientists. The agreed BGN 430,257,776 million are being spent on financing the construction of new specialised research infrastructures or the significant modernisation of the existing ones, as well as on the supply of high-tech scientific equipment, which enables the implementation of scientific research at a global level. It is planned that by the end of 2023 new employment opportunities for researchers will be created within the COEs and the CCs: 70 new job positions (in full-time employment) for the COEs and 180 for the CCs.

The projects are aimed at conducting research and the results will be potentially applied to the industry and the business. Representatives of companies operating in the respective sector, including international companies, are involved as associated partners of the scientific organisations. Activities for technology transfer and commercialisation of the research results are envisaged to ensure the long-term sustainability of the model. These centres aim to bring together the research capabilities of BAS, the HEIs and other key scientific and business organisations so as to consolidate the research capacity, improve the research infrastructure, establish partnerships and relationships between stakeholders in the field of research, and increase the level and the market orientation of the research activities of the research organisations involved.

These centres will create the necessary conditions for attracting highly qualified researchers to conduct research at the highest European level and will significantly improve the capacity for applied research, experimental development and innovation. COEs and CCs are also included in the National Roadmap for Research Infrastructure (NRRI), which was updated in 2020 to ensure their sustainability after the completion of the OP SESG in 2023.

Since 2018, the structures of the NRRI have been regularly financed and the funds have been increasing annually. Using the funding provided, some of the infrastructures have made significant progress. Thanks to this funding, some of the research complexes have been completed and modernised and have

purchased specialised equipment, which allows for world-class research and the provision of high-tech services to the business.

8.2. If similar projects are envisaged to be implemented in relation to the programmes under the Partnership Agreement, the centrally managed EU instruments or the Just Transition Fund, please outline the demarcation with this project.

The activities in the two components of the Programme are complemented by investments for the development of the research and innovation ecosystem, planned in the Programme for Research, Innovations and Digitalisation for Intelligent Transformation 2021-2027 (PRIDIT) in the following areas:

The first priority of PRIDIT aims at the development of various units of the ecosystem – from the existing ones, through identifying the missing ones. The support is for the development of their scientific, infrastructural and human capacity. Research universities are an important part of this ecosystem, and the support for them within the current programme of Priority Innovative Bulgaria of the National Recovery Plan will contribute to the construction of this essential part of it.

The second priority of PRIDIT plans investments in the development of a national model for the development of a technology transfer system. These activities will complement the partnership programmes with the research university industry for technology transfer.

The activities envisaged in the second pillar of the program will be in synergy with the initiatives envisaged under the operational program, as the State Agency for Research and Innovation shall carry out the necessary coordination and synergy between them.

The activities provided in the first and second pillars of the Programme are also complemented by the measures set out in the Programme for Innovation and Competitiveness of Enterprises 2021-2027 in the following areas: development of innovation in the enterprises and stimulating their transition to Industry 4.0.

The activities provided in the Education Programme for the establishment of a good foreign language training for some of the Bulgarian university professors and researchers will help to enhance their language capacity, and hence will help for foreign language programmes and courses to be created, for foreign PhD students to be attracted and for their further participation in research consortia and communities. All this will increase the internationalisation of the research and innovation activity of the country.

9. Does the project directly contribute to the implementation of any Specific Recommendations of the Council, addressed to Bulgaria in the framework of the European Semester for the 2017-2020 period? Please, describe in what way.

The activities under the two pillars of the Programme aim to overcome the weak relation between science and industry, which will help for the development of a knowledge-based and innovation-based economy. The programme will increase public and private (by programming and setting such criteria) investment in research and innovation. It will invest in the training of young and trained staff who will support micro-enterprises and SMEs with their skills and their scientific and expert potential for the development of technological modernisation, innovation and new skills.

At the same time, through the implementation of the programme, investments will be made in areas such as digitalisation and innovation – areas in which the Bulgaria's results, and in particular of its small and medium-sized enterprises, are well below the EU average. Last but not least, the establishment of

networks of research universities will help for overcoming the fragmentation of the public research base and for achieving more successful and concentrated search for joint solutions to public challenges.

The programme contributes to the implementation of the following recommendations addressed to Bulgaria:

- Increasing the intensity of Research, Development and Innovation activities (RDI)
- Reducing the fragmentation of the public scientific base
- Increasing public and private investments in RDI
- Reducing the fragmentation of public investments in RDI
- Improving the management coordination of the national and European public funding
- Improving the relation between academic circles and enterprises
- Digital transformation of enterprises, improving the digital skills and maintaining the competitiveness and the job opportunities.

10. Does the project contribute to the implementation of a reform in a given sector? Please, describe in what way.

Through this programme the provision of Article 91a of the Higher Education Act will be fulfilled, as the public funding for research activity in the higher schools will exceed by at least 10% the funding for education.

On the other hand, a differentiated funding model will also be achieved based on scientific results, and it will be linked with new challenges and applicability of the results as a subsequent impact of the scientific activity of higher education institutions and scientific organisations on the country's economy.

All investments under the Programme and in its two pillars are in line with the two key reforms in the research and innovation sector: the structural and political reform related to the establishment of the State Agency for Research and Innovation and the change in the Higher Education Act, which provides an opportunity for supporting the research activity, transfer and commercialisation of new knowledge and technologies in the universities.

The establishment of the new State Agency for Research and Innovation marks the beginning of a policy which is new to the country and which links the two areas in a common strategy, common priorities and objectives with a clear focus on the development of society and the country's economy. The transfer of functions and responsibilities from the Ministry of Economy and the Ministry of Education and Science to the new structure creates preconditions for increasing the effectiveness of the policy. The pursuit of the priorities in the national and the common strategic documents is facilitated, as well as the management and monitoring of material support measures for the economic operators and the institutions which work on developing research, innovation or technology transfer. The Agency is expected to play a key role in the national policy of interaction between research and innovation and for the development of the national research and innovation ecosystem. It will coordinate, complement and differentiate investments under the various instruments (European and national) in regard to their planning and implementation in order to focus efforts and resources and to ensure full capacity, use, development and renewal of the already built infrastructure and of the infrastructure which is under construction.

The establishment of the State Agency for Research and Innovation will help in overcoming the resources fragmentation by mapping the existing scientific capacity and the available research infrastructure, preparing a plan for dealing with the fragmentation in the system, as well as guidelines and rules for the integration of this infrastructure in a network together with the centres of excellence, the centres of competence and the structures in the NRRI. An essential moment of the reform planned is the construction of an information system for monitoring and assessment of the scientific activity in the

country, a management structure of the programme and project cycle, including the level of higher schools and scientific organisations through integration in the registers maintained by the National Centre for Information and Documentation (Ministry of Education and Science), which will provide a better visibility of the scientific results, the allocated financial resources (including those utilised under European and international programmes) to higher schools and scientific organisations and last but not least, an easier establishment of relations with the business to search for partners for joint applied developments. Identifying of the leading research universities gives a clear focus to the efforts to overcome the fragmentation of the public scientific infrastructure and aims to strengthen and consolidate their scientific capacity in the ISSS areas of impact in regard to the development of new applications and innovations for the needs of the industry and for the improvement of the quality of life. At the same time, the programme is fully oriented towards the challenge of increasing the role of science and innovation in the development of a competitive economy which deals successful with social challenges by intensifying the scientific and applied research activity in the higher education sector through further development and appropriate balancing of the programme's forms of funding and co-funding by the business. It also aims to respond to the need of introducing quality practical training in innovation and entrepreneurship for young doctoral students in order that an entrepreneurial culture is cultivated and the students get acquainted with the mechanisms and steps for introducing innovations to the market. All this will contribute to the introduction of modern and effective methods for teaching university students and doctoral students in the higher education system, giving them an opportunity for a greater mobility, which in turn will increase the quality of university education, will attract quality and motivated young professionals to a scientific and teaching career, thus encouraging the intensifying of scientific activity in the higher education institutions.

The reforms aim to gradually increase the subsidy for research universities, until it reaches at least 40% of the total subsidy for research HEIs in 2025. Thus, after assessing the impact of the programme through the Recovery and Sustainability Plan, the state will undertake its commitments to ensure subsequent sustainability of the public funding of activities under Pillars 1 and 2. A reform is also being planned in the manner of forming the budgeting for research HEIs, after the second year of the implementation of the programme under the Recovery and Sustainability Plan.

The activities under the First and the Second Pillars of the programme are fully aimed at strengthening the transfer of research results and technologies, supporting and internationalising the research and innovation system. These activities are expected to enhance the scientific and economic potential of all Bulgarian regions and to lead to the creation of jobs with high added value for the economy in the medium and long term. At the same time, the attracting and retaining of human resources will contribute to overcoming the aging of the academic staff.

Last but not least, the programme aims to create a favourable environment for an active interaction between science and business (with conditions set from top to bottom, e.g. the Advisory Board, but also prerequisites for seeking collaborations from the bottom up: by using the information system for the implementation of specific work at the request of the business, but also in the joint application for specific projects) and to support the establishment of active and sustainable partnerships between the main components of the "knowledge triangle".

This reform is further supported by the opportunity created by the amendment in the Higher Education Act to promote research activity, transfer and commercialisation of new knowledge and technologies in the universities. The implementation of the National Strategy for Development of Scientific Research in the Republic of Bulgaria 2017-2030 continues as well, with an emphasis on improving the monitoring and

assessment of research activity, accompanied by **increasing and prioritising the public investments based on objective scientific results indicators.**

In addition, investments under the second pillar, related to the creation of a network of research universities, contribute to the implementation of priority axes “Technological Development and Innovation” and “Entrepreneurship and SME Growth Capacity”, which relate to Specific Recommendation 3 of the National Reform Programme of the Republic of Bulgaria for the implementation of the Europe 2020 Strategy (updated for 2020, adopted by Decision No. 296 of 30 April 2020), in particular to the transition of the Bulgarian economy and thus basing it on knowledge and smart growth by increasing the role of innovation and science, creating favourable conditions for higher technological development, creating and implementing new products and services in country specific priority sectors and by developing innovative enterprises.

11. Does the project contribute to the development of any aspect of sustainable economic development? Please, describe in what way.

The programme will contribute to achieving progress under Sustainable Development Goal 9 “Building flexible infrastructure, promoting inclusive and sustainable industrialisation and stimulating innovation” and under Sub-goal 9 “Significant increase of the access to ICT technologies and strive to provide universal and affordable Internet access in the least developed countries by 2020”.

The activities set out in the Programme stimulate the economic recovery from the COVID-19 induced crisis by contributing to the reform of the sector through the development and implementation of innovative products, processes and business models intended to enhance the resource efficiency of the economy as well as to support the implementing innovations that would address the still high carbon intensity of the economy. Increasing the capacity of the research universities and establishing relevant networks between them will enable scientists, innovators and entrepreneurs to work together and strengthen the relations between science and business. This will enhance the quality of the research output and will increase the potential of the innovative studies for a lasting and tangible effect. At the same time, the project also falls within the scope of the European Commission’s “An economy that works for people” priority for 2019-2024 period, which focuses on the implementation of a more attractive investment environment and growth, leading to better job opportunities, especially for young people and within small enterprises. Moreover, the project will contribute to the implementation of another two priorities, namely “Europe fit for the Digital Age” (in view of the fact that, generally, most innovation are concentrated around digital services) and “A Stronger Europe in the World” (through improvement of Bulgarian, and indirectly European competitive power worldwide).

12. Does the project contribute to the implementation of the objectives of the National Development Programme Bulgaria 2030? Please, describe in what way.

The interventions envisaged in the Programme relate to the implementation of Development Axis 1 “Innovative and Smart Bulgaria”, Objective 1 “Accelerated Economic Development”, Priority 3 “Smart Industry”, sub-priority 3.1. Economy and industry digitisation.

13. Will the project contribute to the implementation of the objectives and priorities set out in the Integrated National Energy and Climate Plan? If yes, please describe in what way.

The programme will contribute to the implementation of the priorities of the Integrated National Energy and Climate Plan by ensuring Bulgaria’s participation in European partnerships in the field of energy and climate.

Investments in research universities contribute to meeting the objectives set out in the Research, Innovation and Competitiveness Dimension by providing funding to public and private (as a result of the programming) research and innovation. The network of research universities will strengthen both the “science – science” and the “science – business” relations, which will contribute to the development of innovative energy solutions such as the creation of high-efficiency technologies, e.g., the development of electrochemical energy sources, such as batteries, accumulators, hydrogen and combustion units. This will be instrumental in meeting the challenges of decarbonisation, reducing energy costs for consumers, reducing harmful emissions and will increase people’s quality of life. All these priorities fully comply with the goals of the European Green Deal.