Project Application Form

Under the Recovery and Resilience Facility

1. Project name

Creating a national STEM skills environment for tomorrow

2. Description of the project (objectives, main activities)

After the successful launch of the National Program "Building a school STEM environment" and the to ensure wider access to a specialized technological environment, including modern ICT technologi build a comprehensive educational STEM environment in Bulgarian schools, including renovation, and creation of a new space that allows quality education - laboratory complex and environme competence and teamwork outside the classic classroom system. In the educational environment, la developed and upgraded to acquire skills and work on projects through modern equipment for expe in all STEM areas and implementation of digital technologies, including those that allow to work in synchronous and asynchronous and mainly to increase digital literacy and motivation to learn and pr and skills in disciplines and areas related to natural and engineering sciences, artificial intelligenc natural sciences, but also linguistic knowledge, in the field of arts and others.

The project responds to recommendation 4 of the country-specific recommendations given by the E for Bulgaria for 2020 in the framework of the European Semester 2020: assessment of progres reforms, prevention and correction of macroeconomic imbalances and results of in-depth reviews in with Regulation (EU) (1176/2011:

- improve employability by strengthening skills, including digital skills;
- increase the quality, relevance of the labor market and the inclusive nature of education and trainin for vulnerable groups and the Roma.

The project is entirely in the field of education, and its implementation contributes to improving education and the accumulation of practical knowledge along with theoretical, providing conditions the digital literacy of students, teachers and parents, as well as for inclusion in the educational proce from vulnerable groups.

The investment in innovations with a focus on STEM is in line with the ongoing reforms in the educa the country, and the application of the competence approach. The implementation of the project w development of the school community and increase the motivation for learning, commitme achievements of students. It will support the development of practical skills related to solving real teamwork, and tailored to the needs of the labor market. At the same time, creativity, critical, mathematical thinking will be stimulated through experimental, project and research training.

The school base could also be used as a resource for adult learning by developing integrated traini the local level, which will contribute to expanding the circle of people with digital skills.

STEM centers and the overall new environment will create conditions for the development of key sk in professional and social life through the promotion of education in natural and engineering scienc biology, mathematics, robotics, etc., including the humanities and arts. There will be an opportunity of new work models, for increasing the motivation, as well as for improving the qualification of the te

The STEM school environment includes complete interior solutions in schools, modern equipment wi multifunctional furniture, flooring, lighting, flexible partition solutions for group work, training equip materials on robotics and other practical activities. The STEM skills environment requires the cr models for the acquisition of key competences for lifelong learning, including skills that support critical thinking of digital creativity, as well as those related to active citizenship and solving life problems, in dynamics of technological and social transformation of society. They are all related to inf communication technologies.

In addition, the construction of STEM school environment includes: training and professional d teachers, integrated educational content, extracurricular activities with other schools and institut NCAS, HEIs, museums, children's research centers, companies and manufacturing companies

organizations, etc.).
This project is also related to recommendation 3 of the Specific Recommendations - to focus inve
field of green and digital transition.
The activities under this project are in accordance with Priority 1 "Education and Skills" of the Nationa
Program: Bulgaria 2030. They are aimed at providing modern facilities and information environmen
creation and development of school centers; integrated, favorable and inclusive educational
developing creative and critical thinking and enhanced ICT and STEM training; achieving complianc
with the needs of the labor market; providing continuing teacher training aimed at improving di
innovative teaching skills.
Investments in STEM centers will be essential to make educational institutions an attractive
environment and to improve educational outcomes.
The planned activities are in accordance with the objectives and measures of the draft Strategic Fra
Development of Education, Training and Learning in the Republic of Bulgaria (2021-2030), aimed
focused on the formation and development of competencies, skills for living and working in 21st ce
and talents, promotion of innovations, modernization of the educational infrastructure towar
development. The project will contribute to the implementation of the National Development Pro
2030, where Priority 1 "Education and Skills" aims to increase the scope and quality of education ar
an emphasis on the competence approach, acquisition of analytical skills and development of crea
investments in the educational infrastructure and modernization of the material base in the kind
schools, which will help for the transformation of the educational institutions in an attractive and i
environment and for the improvement of the educational results. The project will also help increase
Bulgarian students in the Program for International Student Assessment - PISA, increase interest i
motivate students to improve educational outcomes in general.
The implementation of the project fully complies with the principle of not causing significant harm,
European Green Deal.

Project objectives:
- Building an educational STEM environment for the implementation of innovative teaching methods
- Providing a favorable, attractive and inclusive educational environment in which to increase inte
and research with the help of modern technologies.
- Formation of competencies and skills for communication and teamwork and stimulation
communication and motivation to solve problems.
- Increasing the skills for professional realization on the labor market, motivation for learning and e
education for all students, including vulnerable groups.
The goals will be achieved by creating the following products (key results):
- Creation of laboratories, robotics halls and spaces for electronic content, modern digital worksh
training spaces with conditions for experimental work for application of theoretical knowledge in a rea
with motivating technologies for learning by doing, with electronic expeditions for prospecting an
knowledge with augmented virtual reality, etc.
- Development of digital skills through the introduction of digital technologies, including virtual
development of knowledge, skills and interest in STEM, development of interest in software engine
robotics, linguistics, arts, etc.
- Improving the qualification of teachers by acquiring practical skills by developing and applying inno
and subjects, introduction of new integrated subjects / physicochemistry, ecology, artificial intellige
etc./ and introduction of new teaching methods (project and problem-based teaching, research trai

Activities and direct results of the program (activities and outputs):
Schools can apply to build several main types of STEM projects, which are the main products (
project. STEM centers are a combination of several existing spaces with a common goal - practic
training in exact, engineering, information technology, and related activities for creativity and inno
successful implementation of the STEM centers a motivating architectural environment is create
educational technologies are introduced, teachers are trained to work in the new center, new role
integrated and project-based training in the STEM center are introduced (if applicable). , new educa
is created (new integrated learning units, new educational activities, new subjects, etc., if a

partnerships are established with the school community (external specialists, companies, research c
Types of STEM centers:

• **Workshop / Makerspace-type corners** - the project may include the creation of separate spaces classroom (corners) for creativity and digital technologies or the transformation of one or two classroo place. These projects aim to encourage the interest of a wide range of children in creative activities a of solutions (a combination of handmade and digital products). Activities in this school space shou (but not limited to) solving real-life problems such as creating effective engineering solutions to problems, creating industrial prototypes with a 3D printer, solutions to social causes and more.

• **Research laboratories** - these are small or complementary projects for practical equipment a natural sciences, provision of research needs, applied research and laboratory work. The aim is to two office spaces, storage rooms or classrooms for a laboratory, or to install laboratory stations in s The project may also include mobile / portable digital laboratory kits, technical equipment, licenses platforms with electronic content in science, etc., necessary for the applied work of students.

• **Classroom for creative digital creators** - these projects aim to encourage students' interest in d and the creation of digital content similar to the proposals in the large project category, but on a sma example one or two classrooms with adjoining common space. The project aims to build an innov space and can include various hardware and software technologies - according to the needs of stu and engineering kits, 3D printer, electronic boards and microcomputers, creative corners, zoos and

• Center for Young Researchers - A guiding principle in shaping the innovative physical enviro suitable for the stages of development and learning of the youngest students. The Center for Youn aims to promote a research approach in teaching and integrating subject knowledge from different in order to develop 21st century skills in students, basic, linguistic and functional literacy, creative a coping skills in different situations and positive psychology. The center will promote creativity and w based learning in digital and non-digital environments, the development of skills for teamwork and in roles. Learning spaces can be organized into corners and areas, allowing a different, flexible o organization of the day. The environment may include areas for indoor and outdoor applied work physical sciences), zoos, robotics stations with age-appropriate tools, and more. The new environm encourages group planning among teachers and joint classes, classes of all-day organization of t extracurricular activities and activities in partnership with external organizations (museums, libraries, research centers, etc.).

• **Technology Center in the Creative Industries** - This type of center may be inspired by the expa the creative industries as part of the value-added economy. The center will provide a technolo environment for students interested in developing digital / video games, mobile applications, m product development, digital marketing, graphics and design and more. The purpose of this type o and content is to encourage the development of creative digital skills in a motivating way, incl. to dir professions related to the creation of video content, video games and digital tools, digital platfor applications or the development of new products and services in a technological environment. T include the equipment of classrooms with computers and specific software in accordance with th creative industries (for drawing, animation, modeling, editing, editing, 3D design, etc.); creative corne video studio and recording equipment; recording studio; simulation equipment, virtual and augment and audio equipment for linguistic activities.

• **Center for digital creators** - the center can provide general education activities, including digita as well as create conditions for work in some of the following areas: application programmer, syste profile "Hardware and software technologies" and others. The center aims to encourage students' in science and the creation of digital content with a wide range of applications in a real environment. that the environment simulates a real work environment in a technology company, including a pla activity, individual and team work, non-traditional learning and work environment, high-speed intern etc. The center could provide work to students to create applied projects that solve real cases an business and life of modern man and society. With the help of electronics and robotics, research, ex analysis, students will be able to create economic and technological solutions based on the premis integrated and inclusive management of natural resources and infrastructures. According to the vis of the particular school, this type of center can offer 3D equipment, electronic boards and microcom programming tools and robotics. The center may also include the creation of makerspace worksho

• Center for Natural Sciences, Research and Innovation - the center could provide students with w

projects that solve real cases and problems of business, research, experiments and analysis. The
new methodological techniques related to problem-based learning, study expeditions, case studie
The center will provide an environment that could be used in general education and specialized trai
in dual classes in vocational schools for training related to the content and processes of the real wo
in partner companies. The center may contain practical laboratories for traditional natural sciences, a
specific environments such as laboratories for biotechnology, genetic analysis, pharmaceuticals, el
production, agrotechnology, soil analysis, etc. - according to the needs of the specific school. It is
the whole project is a combination of a new learning environment, learning content and practic
teaching methods.

The creation of a STEM environment in a school includes several important dimensions, taking into a
such as the professional profile of the school, the educational level of the students - primary, second
The creation and equipment of learning spaces is focused on the study and application of compe
respective subject area and educational stage.

The school STEM environment includes a combination of activities that contribute to the creation o
effective learning, including in the context of a pandemic or its consequences:
1. Creation of a new architectural educational environment (which is the physical STEM center), w
learning spaces with appropriate distribution, modern lighting and sound, workstations, furniture a
related to learning STEM activities. (Detailed description of the architectural environment, corres
modern tendencies in STEM teaching, you can see in the Guidelines for architectural environm
National program for school STEM environment at https://stem.mon.bg, in section Guidelines for ap

3. Implementation of modern technological equipment that provides innovative and interactive STEM
tailored to the needs and interests of students in different educational stages. Bulgaria is part
processes for digitalization of education, which began with a view to the overall transformation of s
economy and were intensified by the pandemic of COVID-19. The pandemic opened the door t
hybrid education in the future and the need to maintain a digital culture in schools and after the re
face learning. Digital skills and competencies, which were important for students in technology clas
who had to cover a certain computer science schedule, are today a priority for the entire educati
Moreover, this knowledge will increase the competitiveness of the younger generation in the la
reverting to face-to-face learning, there is an opportunity to accelerate the in-depth transformatio
and to preserve and integrate some of the best practices of distance learning into the future curricul
reality, technology-enabled teachers will have the opportunity to create a more flexible and inc
environment in high-tech connectivity and equipment in high-tech integrated classrooms (HTIC). In t
level of technological support should be appropriate for students from different educational stages
The provision of state-of-the-art technological equipment, compatible with the available resources
incl. providing online training (video walls, personal devices for teachers and students, presentati
microcomputers, etc.) will enable the creation of interactive spaces for the use of both new technol
teaching methods. HTIC will also help students and teachers to quickly develop and combine exis
but also to include external content in the teacher's own teaching materials. When all classrooms i
equipped with ID, this would allow for much more in-depth and complex learning by doing and e
both students and teachers. IDs can be connected in a larger unified system that will allow all classe
in the STEM project without physically leaving the classroom, and connecting schools in differe
longer require any effort. For example, a chemistry class in one school may join a biology class in
the same time explore theory in practice from the perspective of both subjects. The same is true fo
would like to collaborate in online lessons from several different places, as well as to teach an ed
from different perspectives on science. Moreover, a student under quarantine or other occasions o
can interact remotely with the classroom while at home, connecting their computer to the ID, in th
when present in the classroom. Interactive displays are also very useful in schools, where each cl
classroom, so there is no need to physically change their location to visit a particular laboratory, th
risk of spreading infections and infections. 3. Expansion of the combined method of teaching (fa
distance) by developing innovative teaching units and introducing new teaching methods (projec
based, research training, etc.), which allow high efficiency of the educational process in differ

conditions (synchronous and asynchronous, in combination of present, in electronic environment or

4. Teacher training - the epidemic of COVID-19 showed the need to strengthen their digital compete ability to teach using ICT. The construction of STEM centers and environments in schools w acquisition of practical skills for the use of new technologies in teaching. The latest TIMMS study sho is a big difference between the training needs of Bulgarian science teachers (at grade 4) in integ teaching and the actual training they undergo. Teachers need to be trained not only on how technologies to teach STEM, but also on new pedagogical approaches supported by the use of digita as well as by further strengthening their training in teaching the competence approach. STEM c support the implementation of the reform transition to the competence approach set out in the Strategic Framework, as it will allow teachers and students to use practical and research approach it will strengthen the interdisciplinary nature of training, improve teamwork, encourage the use of sci and models. STEM centers promote a research approach in education based on scientific methods practical work in a laboratory environment of the accumulation of knowledge and skills related to na including mathematics and computer science. Under this project, activities will be implemented tha the activities under the Education Program and REACT EU, but with a clear demarcation betwee instruments.

5. Attracting specialists from the scientific community and business to improve the quality of education. better coordination of education with the needs of the labor market. The inclusion of representatives community and business, such as mentors, teachers, project managers, etc., will further strengthe to the competence approach to training and will support career guidance. 6. Introduction of ne management of STEM centers, to fill it with content and to support the interactive and practically ori in school, related to the construction of the new STEM environment. Such roles can be: STEM ce technological director (position of deputy director of the educational part, with the position of coo introduction of digital technologies in teaching and a coach / methodologist, providing support to the coordinator of STEM activities, etc., according to the strategy and needs of the specific school. (M new roles in the STEM center, corresponding to the current trends in STEM teaching, you can see in Guide for the National Program for School STEM environment at https://stem.mon.bg, in the section application).

6. Project management and monitoring - the project management and monitoring will be carried out of Education and Science (MES) through a structure determined by the Minister (internal or externa will be carried out through guidelines, instructions, construction of an information system and co inspections, verification, communication activities, etc.

7. In this regard, approved projects must include the following characteristics:

   • Flexibility: the rooms can be used for a wide range of activities of different age groups, and change quickly before the start of the class. This includes movable walls, allowing to change the workspace, infrastructure of the room so as to allow the creation of empty spaces;
   • Mobility: desks, chairs, boards, etc. to be light and on wheels, which allows the rapid change of sp to the needs of the students themselves. The floor covering is also in accordance with the need f also for conducting experiments and researches.
   • Technological security: the rooms must have constant high-speed internet, a sufficient number cables for electricity, as well as the possibility to use equipment such as interactive whiteboards devices, 3D printers, computers and tablets depending on students' needs. Due to the consta technology, the rooms must be able to adapt to new challenges and opportunities.
   • Effective organization of spaces: due to their use by different students for different purposes, it rooms to become cluttered quickly and not be able to be fully used. Therefore, it is necessary to ha movable cabinets and storage spaces in order to achieve a reasonable organization of the spac space for storage of projects and materials.
   • Design of learning spaces to support collaboration and teamwork: STEM classrooms encourage pr teamwork, so it is necessary to have the opportunity for freedom and movement, as well as the searc

solutions.
• Environmental sustainability: Well-designed STEM classrooms encourage the problem-solving, c
innovation and collaboration skills needed to address today's environmental challenges. Because s
topics on climate change in their STEM lesson plans, sustainable classroom design is a way for sc
and teach by example.

Calls for applications and selection
The project implements a systematic policy for the construction of STEM centers in all schools in Bulg
the goal is for each school to have a STEM center, the schools will develop their idea in concrete
submit a project proposal, which will be considered and which will be given feedback in order to impro
the existing concept. In this way, the program will build on the experience already gained from the Na
"Building a School STEM Environment" and previous programs that have built capacity in schools
similar projects.

When submitting project proposals, schools will be assessed for readiness to implement their proje
of candidate schools does not have a high level of readiness in the first wave, they will be left for
third wave of implementation, and will be able to benefit from ongoing support for quality dev
implementation of their projects.

The first wave will include a small percentage of beneficiary schools in order to develop successful m
centers at the beginning of the program (benchmarking), which, together with the school centers buil
"Building a school STEM environment" to serve as an example and standard for the implementation o
projects.
There are 3 competitions and selection:

1) First stage: 15-20% of the total number of schools that are not funded under the NP (indicative
420 schools)
Application: 1/2022 (by quarters)

2) Second stage: 40-45% of the total number of schools that are not funded under the NP (indicative
950 schools)
Application: 4/2022 (by quarters)

3) Third stage: the remaining between 35-45% of the total number of schools that are not funded
(indicatively between 735-950 schools)
Application: 2/2023 (by quarters).

Deadline for implementation of projects from the third wave of applications: 2/2025 (second quarter
item 4 - Time schedule for implementation of the program).

* Calculation base: 2100 schools.

8. Beneficiary

The schools within the Ministry of Education and Science, the Ministry of Culture, the Ministry of Youth and
municipalities in the Republic of Bulgaria

9. Time schedule for project Implementation, including activities, stages[1]

[1] The time schedule shall be relevant for determining interim targets within the framework of the Recovery and Resilience Plan and is directly related to the disbursement of grant instalments from the Recovery and Resilience Fund.

2021 - 2025

The main stages of project implementation include:

1. **Preparation of the program** - 6 months

a. Development of application guidelines;

b. Preparation of good examples for STEM projects, admissible and recommended parameters environment (furniture, equipment, interior design, training content, etc.)

c. Creating a website, social networks, application platform, preparation of a database with schools, etc

d. Development of selection criteria;

e. Selection and training of evaluators;

f. Conducting a national communication campaign and to acquaint the schools with the program and schools for application.

2. **Applying with project ideas**

Includes development and application with a project idea from the respective school - 3 months in application.

3. **Selection of project ideas, feedback and ranking**

This stage includes 3 months in each wave of application.

4 **Implementation of projects**

4.1. Implementation of construction and repair activities under the project, incl. development documentation and construction supervision - 12 months from the approval of the overall project propo

4.2. Purchase of furniture - 12 months from the approval of the overall project proposal;

4.3. Purchase of equipment, including for high-tech integrated classrooms - 18 months from the approva project proposal;

4.4. Training of pedagogical specialists and introduction of new roles in the management of the STEM educational content - 18 months from the approval of the overall project proposal;

4.5. Establishment of partnerships and creation or identification of appropriate existing educational co programs for the STEM center (if applicable) - 18 months from the approval of the overall project propo

4.6. Sharing the results of school projects - 18 months from the approval of the overall project proposa

5. **Management, monitoring and evaluation** - throughout the implementation of the program, subsequent years, according to the needs of the study of the long-term impact of the program.

6. **Communication activities** - throughout the implementation of the program.

Table 1: Time schedule for program implementation - First wave of applications

Implementation of activities by quarters		2021		2022				2023				202
		By quarters		By quarters				By quarters				
		3	4	1	2	3	4	1	2	3	4	1
Developing a STEM environment												
1	Preparation of the program, development of application guidelines and selection criteria	X	X									
2	Development and application with a project idea from the respective school			X			X	X				

3	Selection of project ideas and ranking				X			X	X			
4	Implementation of construction and repair activities under the project				X	X	X	X	X	X	X	X
5	Purchase of furniture						X	X	X	X	X	X
6	Purchase of equipment, including for high-tech integrated classrooms						X	X	X	X	X	X
7	Training of pedagogical specialists						X	X	X	X	X	X
8	Management and monitoring	X	X	X	X	X	X	X	X	X	X	X

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

Up to two months after its approval.

10. Indicative financial resource by activity, including sources of financing (national budg funding, private funding, IFIs)

No national co-financing is envisaged.

It is envisaged that the project will build STEM environment / complexes in all schools, and wil achievements of the national program "Building a school STEM environment" or with other tools. It is the applicant schools to be able to prove the possibility of integrating the complexes into the existing in in projects for its improvement. The application will be made in three stages - in 2022 and in 2023.
The project will be financed on the basis of project proposals developed by the respective schools, wh the construction of STEM complexes, equipment of high-tech integrated classrooms (HTIC), including of linguistic skills, art classrooms and more. The selection of projects will be carried out according to selection of projects, and the degree of readiness for starting the implementation will be taken into accou for approval of project proposals for the construction of STEM complexes will be similar to the crit National Program "Building a school STEM environment" related to the assessment of compliance w and the assessment of implementation of objectives is important to measure real progress sustainab activities. The goals in school projects can be related to increasing the motivation for learning, success the inclusion and attendance of students in the school, inclusive techniques and to the career professional realization of students.
The schools will be grouped in 6 groups according to the number of students. In schools with up to 10 planned to build 1 STEM office and 1 HTIC, as the necessary funds for this purpose are BGN 60.0 t amount is determined, and other things being equal, 50.0 thousand are taken as a basis. BGN for the c a small STEM cabinet under the national program. About BGN 10.0 thousand are needed for the creatio Indicatively, it is envisaged that one HTIC will be created for 40 students (on average for the country 20 in one class). The number of STEM classrooms and HTIC in the individual groups is determined ac number of students in the school, and in larger schools it is planned to build STEM complexes. The p cover about 2,000 schools in the country.

Trainings for pedagogical specialists are also an integral part of the project implementation. The training courses on the use of information technologies in the educational process, trainings for teaching tea work, practical and research approaches, improvement of the qualification for interdisciplinary work and to the work in STEM environment. All pedagogical specialists from school education who have state training are eligible. The training of pedagogical specialists for work in STEM environment and HTIC refers only to this purpose, namely: work with specific equipment and technologies, electronic product in integrated curriculum in natural sciences, but also others. subjects - fine arts, music, linguistic exe language, etc. The trainings also include work for organizing the trainees for blended learning, for work in the specific STEM environment.
The project includes management and monitoring, providing for the development of application guidelin for project requirements and implementations; announcing and conducting the project procedure; training of experts; evaluation of proposals by a panel of experts; giving feedback on project proposals i

capacity; building an information system and monitoring and analyzing the implementation of projects; c
activities; on-the-spot checks; providing expert, methodological and organizational support; cost verifica
the periodically paid funds from the EC (every 6 months) and paying the beneficiaries for the achieved
External impact assessment will include the study of the different levels of results and the impact of th
the final beneficiaries, incl. tracking students over the years. According to the World Bank, the industr
conducting impact assessments of such programs is between 1 and 4% of the program's financial reso
Respectively for expert preparation of the program, ongoing monitoring, external impact assessment
management of databases, analysis and methodological support in the course of implementation - up
of 4% of the total project budget.

For information and communication activities - up to a maximum of 1% of the total project budget. The e
are for information and communication activities at regional and national level.

Table 2: Indicative distribution of the financial resource under the program, according to the schools and the different parameters of the STEM centers

Groups according to the number of students in the school	Number of schools in a group	Number of STEM funded under national program	Number of schools without STEM environment	Total funds for STEM financing (including HTIC) (in BGN)	Total funds for financing of all schools (in BGN)	Management, monitoring, evaluation and communication activities	Total funds for project implementation (in BGN)
Up to 100	646	144	502	60,000	30,120,000	903,600	31,023,600
from 101 to 200	482	1	481	130,000	62,530,000	1,875,900	64,405,900
from 201 to 400	518	10	508	250,000	127,000,000	3,810,000	130,810,000
from 401 to 750	427	97	330	450,000	148,500,000	4,455,000	152,955,000
from 751 to 1000	134	0	134	650,000	87,100,000	2,613,000	89,713,000
above 1001	81	0	81	1,000,000	81,000,000	2,430,000	83,430,000
Total	2,288	252	2,036		536,250,000	16,087,500	552,337,500

The indicative amount of funds required for the implementation of the project is BGN 552,337,500.

10.1. Indicative allocation of the financial resource, depending on the type of expense

- Construction / rehabilitation of infrastructure (construction and installation work) - 40%
- Physical capital (purchase of machinery and equipment) - 35%
- Human capital (skills development, retraining…) - 10%
- Labor (wage costs, consulting services () - 5%
- Technology (costs for acquisition of intangible fixed assets - patents, software…) - 10%

11. Indicators

11.1. Activities indicator/s

a. Activity indicators

Table 3: General statistics, according to the 6 groups of schools and the expected final number of esta
centers and HTIC

Groups according to the number of students in the school	Number of schools in a group	Number of built STEM classrooms	Number of built HTIC	Number of teachers who will undergo training

Up to 100	502	502	502	4 950
from 101 to 200	481	962	1 443	6 225
from 201 to 400	508	2 032	2 540	11 400
from 401 to 750	330	2 310	3 300	15 525
from 751 to 1000	134	1 340	2 010	6 975
above 1001	81	1 215	2 025	5 850
Total	**2 036**	**8 361**	**11 820**	**50 925**

Table 4: Activity indicators
* To be read: 3/2021 as "third quarter of 2021"

Activity	Indicators for activities	Baseline	Base year	Intermediate values (no accumulation)	Goal	Deadline
Development of STEM environment	Developed application guidelines and selection criteria	0	2021	4/2021	2	4/2021
	Share of schools (other than those funded by NP STEM) that have developed and submitted a project idea for a STEM center	0	2021	1/2022 – 15-20% 4/2022 – 40-45% 1/2023 – 35-45%	Общо 100%	3/2023
	Selection of project ideas and ranking of projects	0	2021	2/2022 – 1 етап на кандидатстване 1/2023 – 1 2/2023 – 1	3 етапа	2/2023
	Share of the contracted funds under the program	0	2021	2/2022 – 20% 1/2023 – 45% 3/2023 – 35%	100%	3/2023
	Percentage of schools that have completed the construction and repair activities (ie completed stage of the establishment of the STEM center)	0	2021	4/2022 – 0% 1/2023 – 5% 2/2023 – 5% 3/2023 – 20% 4/2023 – 10% 1/2024 – 20% 2/2024 – 10% 3/2024 – 10% 4/2024 – 20% 1/2025 – 0% 2/2025 – 0%	100%	2/2025

	Percentage of schools that purchased furniture	0	2021	4/2022 – 0% 1/2023 – 5% 2/2023 – 5% 3/2023 – 20% 4/2023 – 10% 1/2024 – 20% 2/2024 – 10% 3/2024 – 10% 4/2024 – 20% 1/2025 – 0% 2/2025 – 0%	100	2/2025
	Percentage of schools that purchased equipment	0	2021	4/2022 – 2% 1/2023 – 2% 2/2023 – 4% 3/2023 – 9% 4/2023 – 12% 1/2024 – 16% 2/2024 – 14% 3/2024 – 15% 4/2024 – 9% 1/2025 – 9% 2/2025 – 8%	100%	2/2025
	Percentage of schools that have trained pedagogical specialists	0	2021	4/2022 – 2% 1/2023 – 2% 2/2023 – 4% 3/2023 – 9% 4/2023 – 12% 1/2024 – 30 % 2/2024 – 16% 3/2024 – 15% 4/2024 – 9% 1/2025 – 9% 2/2025 – 8%	100%	2/2025

11.2. Result and impact indicators[2]

Outputs indicators:
• Built educational STEM environment in all educational institutions, based on modern technologies (base
all schools in the country; final - 100%)
• Implemented innovative modern teaching methods in all educational institutions (basic value - 4% (or 100
2400); final - 100%)
• Created an attractive learning environment in all educational institutions (baseline - 3.5% (or 86 out of 2400
Data source and baseline / intermediate / final values:
Data from the Ministry of Education and Science on the implementation of the program. The data sourc

[2] The Theory of Change tool, developed and described by the World Bank's Impact Assessment Unit, was used. "Morra Imas, Linda G .; Rist, Ray C .. 2009. The Road to Results: Designing and Conducting Effective Development Evaluations. World Bank. https://openknowledge.worldbank.org/handle/10986/2699

excerpt from the database for the implementation of the program; monitoring reports on the implementation o
ongoing surveys and surveys among beneficiary schools; data from other organizations in the field of edu
and final reports from the beneficiary schools.

Indicators for medium-term and long-term effect (Short-Term and Long-Term Outcomes):
In order to achieve the main goal of the program - Increased interest of children / students in STEM sciences
and practical elements of research - we will measure data on the following indicators:
• No. students participating in extracurricular activities related to STEM;
• No. students participating in national and international competitions in robotics / digital skills / cybersec
intelligence / natural and applied sciences;
•% and number of students applying for university specialties in technical, engineering and natural sciences
•% and number of students in 12th grade who have requested matriculation exams in mathematics and nat
• Number of students who requested (not accepted) profiles and professional fields after 7th grade related
natural sciences.

Data source and baseline values:
MOES data. Baseline values: previous school years before the construction of the STEM centers.

• New school innovations related to natural sciences and mathematics, technical professional fields, di
creativity and the integration of subject content with STEM.
Data source and baseline / final values:
MOES data. Base values: no. and the type of national innovation related to STEM in the year before the c
the STEM centers.

• Increased competencies of teachers to work in STEM environment;

Data source and baseline / final values:
External impact assessment of the program. The evaluation will include a measurement of a sample of teac
schools and will measure the pre-after effect of the program.

• Built competencies and skills for communication and teamwork, creativity, communication, motivation to s
focus on innovation.

Data source and baseline / final values:
External impact assessment of the program. The assessment will include measuring a sample of stude
schools by competencies and attitudes related to STEM training.

• Interest in participating in extracurricular STEM initiatives at regional, national and international level

Data source and baseline / final values:
MOES data on the number of students participating in extracurricular activities, initiatives and competiti
STEM disciplines. The data from the school year preceding the establishment and commissioning of the
center will be taken as baseline values. The data from one year after the use of the STEM center will be
data, either for the same unique students or for the students who at the time of the final measurement a
educational stage and class as those on whom the baseline measurement was made (eg: the previous 5t
the center and the next 5th grade who studied all year at the center).

• Increased interest in scientific, technological and innovative careers

Data source and baseline / final values:
Data from MOES, BAS, NSI and external evaluation. The base values are in the year before the constructio
centers. The final values will be measured n + years after the construction and commissioning of the STEM
the first graduates trained in them start participating in the labor market. This will require the creation of pa
(tracking unique students over time) as part of a large-scale assessment of the effect of the program.

12. Does the project require the opening of a procedure pursuant to the Public Procurement Act
Yes
12.1. If a procedure under the Public Procurement Act is required, what part of the activities resources will be subject of the public procurement?
80%
12.2. If a procedure under the Public Procurement Act is required, what is the indicative sc implementation?
12 months from the approval of the overall project proposal;
13. Demarcation and complementarity
13.1. If similar projects have been implemented (regardless of their source of funding), desc project builds on/complements what has been achieved with previous projects.
In 2020, the implementation of the national program "Building a school STEM environment" began, un educational institutions have successfully applied for funding for the upcoming construction and equipmen large STEM spaces. The positive beginning of the National Program "Building a school STEM environment" to start looking for opportunities to build a comprehensive educational STEM environment in Bulgarian schoo this project as a step upgrade of the national STEM program. Thus, the aim is to build in about 2000 s complexes, uniting several STEM-centers or STEM-rooms and laboratories that have not received su national program for STEM environment or from other sources. In the period 2018 - 2020, significant investments have been made from the national budget and unde Program "ICT in the field of preschool and school education" for the construction of secure wireless (W including new generation firewalls and access points in all state and municipal schools. These internal ne full coverage and high speed of information exchange according to modern standards and allow the use device from any point of the school with high levels of security. The digital transformation of pre-scho education is also supported within OPSESG, through the project "Education for Tomorrow", where investme made in building a cloud environment and implementing a platform for educational services and content, bui protected educational environment in schools and kindergartens, based on modern facilities / equipment fo / presentation of educational material through ICT. The activities in the OPSESG under REACT-EU and the activities under the new Education Program 2021 planned for implementation under the programs of the Partnership Agreement.
13.2. If similar projects are envisaged to be implemented under the Partnership Agreement p centrally managed facilities of EU or the Just Transition Fund, outline the demarcation wit
Projects envisaged for implementation under the Partnership Agreement programs, the centrally managed the EU or the Fair Transition Fund, as well as the projects financed from the national budget will be demar project, and the activities included for financing will not be eligible. for funding under other instruments. In the project implementation, all necessary actions will be taken to prevent double funding. Complementarity and demarcation at the level of activities and educational institutions will be realized wit under OPSESG, financed with the additional funds under the REACT-EU instrument through ESF and wit under the Education Program for the programming period 2021-2027, financed through ESF +. Within the allocated supplementary budget under REACT-EU, OPSESG envisages the establishment of "Equal access to school education in crisis conditions" under the thematic objective "Facilitating the over consequences of the crisis in the context of the COVID pandemic -19 and its social consequences and ecological, digital and sustainable economic recovery ", according to the rules of Regulation (EU) 2020/22 priority axis, based on the identified specific needs of the education system in Bulgaria for overcoming the

of the crisis caused by the COVID-19 pandemic, a specific objective 1 “Support for school education for o
consequences caused by the pandemic of COVID-19 ”with the following set of activities directly related to o
consequences of the crisis caused by the COVID-19 pandemic and the need for rapid and urgent impleme
• Ensuring the educational process in crisis conditions by purchasing technical means for students an specialists, training students with a focus on vulnerable groups to acquire distance learning skills in environment; training of pedagogical specialists to improve their skills for teaching / conducting distance electronic environment; training of educational mediators and parents to acquire skills for working v educational platforms, working with electronic content, etc .;
• Support for additional synchronous distance learning in an electronic environment. The activity includ additional synchronous distance learning in an electronic environment for students from I to XII grade fo which they are quarantined or do not attend a daily face-to-face form of education for medical or valid reas synchronous distance learning is carried out outside the school hours of students in school who attend a da form, ie. before or after the attendance classes.

The activities included in the amendment of OPSESG under REACT-EU have a secured implementation bu according to Decision № 892 of the Council of Ministers of 2020.

The activities under this project will be complemented by the planned activities under the Education Progran under Specific Objective IV within Priority 2 "Modernization and quality of education" of the PA 2021-2027 a with the group activities (operation) "Introduction of the competency model through modernization of curricul preparation of individual curricula and individual curricula of students with special educational needs and and capacity building of pedagogical specialists" and the group activities (operation) for “Digital transform education, incl. vocational education and training '.

14. Does the project directly contribute to the implementation of any of the Counc Recommendations addressed to Bulgaria in the framework of the European Semester in the 2020? Please describe how.

The project responds to recommendation 4 of the Country-Specific Recommendations given by the EC in t for Bulgaria in the framework of the European Semester 2020: assessment of progress in structural refor and correction of macroeconomic imbalances and results of in-depth reviews in in accordance with R (1176/2011

• improve employability by strengthening skills, including digital skills;

• increase the quality, relevance of the labor market and the inclusive nature of education and training, i Roma and other vulnerable groups.

The Commission's latest report on Bulgaria emphasizes that:

• Significant efforts are being made to improve the low level of digital skills. However, lack of equipment a digital competences of teachers hinder the use of technology in the classroom.

• Efforts are being made to ensure continuity of teaching during the COVID-19 pandemic. However, the a to distance learning has posed important challenges, risking exacerbating already large inequalities in ac education.

The report states that “the digital skills of the young population are low. Only 53% of young people aged their level of digital skills as basic or above basic, compared to the EU average of 83%. The use of ICT in optimal. Despite support from some national programs, overall outcomes in digital education remain low. "

This project is aimed at overcoming this negative trend and at implementing the EU recommendation to incr literacy of the population.

15. Does the project contribute to the implementation of a reform in a given sector? Please des

The project contributes to the implementation of the reform related to the digital transformation and the intro competence approach in the education sector, which began in 2016 and will continue to be a key priority in the of education policies with a horizon of 2030.

The reform in the educational system is achieved through the implementation of measures set forth in normative acts: Law for amendment and supplement of the Law for the pre-school and school education (S 2015) (promulgated SG No. 82 of 18) September 2020) (publ. 18.09.2020) The law lays the foundations of t reform with emphasis on the application of the competence approach, developed in the Strategic F Development of Education, Training and Learning in the Republic of Bulgaria (2021-2030), forthcoming a Council of Ministers. It outlines the measures for the purpose of Bulgarian students to be functionally litera socially responsible and active citizens, motivated to upgrade their competencies through lifelong learning.

Building a STEM environment will support the overall reform of education, including strengthening the inclu education, the competence approach and innovation in all aspects of the educational process. The STEM requires the creation of new models for the acquisition of key competences for lifelong learning. STEM trainin critical and analytical thinking, digital creativity and social and team skills.

The optimization of the educational content is one of the prerequisites for changing the focus in the mechanical reproduction of information to mastering and applying competencies and knowledge. The students related to natural sciences are also expected to increase.

The focus is on STEM training for transition, preparing the next generation to live in a new environment, oriented towards the transition to a green and digital economy. The changes are necessitated by the dyna development, the transformation of professions and jobs, as well as by the new requirements for the c specialists as a result of these processes.

The forced physical distancing resulting from the proliferation of COVID-19 has highlighted the importance information society that actively takes advantage of the opportunities that digital technologies offer. This need to accelerate and finalize digitization and to promote / maintain an adequate digital environment for training.

The general level of digital skills of the population (16-74 years) is low, including among young people Improving digital skills, for example by updating IT-compliant curricula, could help to adapt to changes in the appropriate technical infrastructure will have a positive long-term impact on their access to education, vulnerable groups.

16. **Does the project contribute to the development of any aspect of sustainable economic d Please describe how.**

The project will contribute to the formation of digital skills, as well as social competencies for communication a for remote work in an electronic environment, as well as for digital literacy related to lifestyle. This will h impact on parents, who will also develop skills in this regard. The development of these skills will have a p on human capital in business as a fundamental factor for sustainable economic development. It will also inc in science, the scientific approach and innovation.

Investing in education and skills development is an investment in the future. They have the highest social impact and the highest return in the long run. The modernization of the educational environment, in addit conditions for practical and experimental work, has another positive effect - it creates motivation and d develops skills, stimulates innovation and creativity of students and teachers. All this restores trust and authority of the education system.

17. Does the project contribute to the implementation of the objectives of the National Developm BULGARIA 2030? Please describe how.
The project will contribute to the implementation of the National Development Program Bulgaria 2030, w "Education and Skills" aims to increase the digital competencies and skills of human resources in the cou widely use information and communication technologies (ICT) and based on services and achieving digital g Priority 1.5. "Digitalisation and innovation in education" envisages the use of ICT for the formation of digital for motivation for learning and for higher educational outcomes to be a key policy. Creating a STEM skills a policy that also has a wider range of positive impacts in relation to the sustainable inclusion and full p students in the educational process and increase their motivation to learn ("Sub-priority 1.1. Successf education"), as well as and with the acquisition of key competencies, with the applicability of educati professional realization, with increasing the competencies of teachers (Sub-priority 1.3. Quality of educatio The project will also contribute to the Digital Connectivity Priority, which envisages, along with the develo construction of a modern digital infrastructure and supporting the process of digitalization of economic act the transformation of the economy into one based on data. an innovative and inclusive information society, e quality of life for citizens. The creation of modern STEM centers in Bulgarian schools will provide an adapted physical environmen function areas and mobile modular furniture. STEM centers will also include additional equipment suitable practical and experimental activities related to solving real-life problems, creating products and project-ba Investing in innovation with a focus on STEM will help create school STEM centers to serve as models learning environment - an environment in which the next generations of innovators and creators will be fo the context of distance learning and the new organization of the learning process.
18. Does the project contribute to the implementation of the objectives and priorities set out in Integrated Energy and Climate Plan? If yes, please describe how.
The implementation of the project objectives will contribute to strengthening the capacity of the Republic implement technologies and innovation policies oriented towards green solutions in the field of climate and