Project Application Form
Under the Recovery and Resilience Facility

1. Project name

DIGITAL TRANSFORMATION AND DEVELOPMENT OF ESO'S IT AND REAL-TIME SYSTEM IN A LOW-CARBON ENERGY ENVIRONMENT

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

The aim of this project is to achieve complete modernization of the Bulgarian power system planning, control and maintenance activities by deploying cutting-edge digital tool and methods that provide the required maneuverability, security and low-latency of the power system in low-carbon electricity generation conditions. The ever growing penetration of renewables along with distributed and volatile generation mean that system operation and visibility need to be adapted accordingly.

The project includes a large-scale programme for complete digital transformation of the systems and processes at ESO EAD and consists of the following activities:

Activity 1. Deployment of Substation Automation System (SAS)
A considerable part of the ESO's substations (400kV/220kV/110kV, 400kV/110kV, 220kV/110kV, and 110kV/medium voltage) are operated locally by electromechanical switches and are not equipped with modern systems allowing remote monitoring and control of the power facilities and load flows at the relevant substation level. The aim of this activity is to digitalize those substation and enable their remote control. Measures to be implemented at each site include retrofitting of the corresponding substation as needed, delivery and installation of local SCADA, delivery and installation of new bay control units (local controllers) and modern relay protection and emergency automation systems; upgrade of secondary control with refurbished control and relay cabinets. SAS is planned to be deployed in 171 substations 110kV/medium voltage) and 32 substations 400/220/110 kV.

Activity 2 Modernization of SCADA at Remote Switching Room (RSR) with Remote Redundancy Capability
Modern automation control system are introduced when retrofitting existent substations and building new ones. This enables operation control of substation groups belonging to the Bulgarian power system. Five RSRs currently in service feature systems that will be used for these control purposes. In addition, the information collected in their databases allows various system operation studies. However, the operating lifetime of the systems currently in service at the four existing RSRs (in Plovdiv, Stara Zagora, Varna, and Pleven) is about to expire by the end of 2027. Therefore, their replacement with new systems with redundancy capabilities among individual RSR will ensure an uninterrupted operational process and increased security of control of power facilities at times of pandemics and crises. For this purpose, four new SCADA systems with significantly extended and upgraded hardware and software configuration will be delivered and commissioned within this activity. The new systems are to replace all currently operational SCADA systems due to depletion of latter's service lifetime.

Activity 3 Extension and Modernization of the Telecommunication System with New Substation Remote Control Devices

Currently, ESO EAD owes and operates more than 3500 km of fiber optic infrastructure which is used to exchange process data, protection IED commands, voice communication, and administrative information. The existing FO network includes 200 sites, of which 174 substations and administrative centers of ESO EAD and 54 sites of large network users (NPP, HPP, TPP, RES, large industrial consumers). In order for it to comprise all facilities of ESO EAD, additional 2315 km of fiber optic network needs to be built.
All 297 substations owned by ESO EAD will be covered by this FO network expansion. During phase 2, optical rings with redundant communications between ESO-owned substations will be deployed.
The future secured networks for SCADA data transmission should be developed in parallel with the optical system extension (OPGW, ADSS) and with the preparation of sites for remote control from RSRs. To this end, a New Network Management System will be built and new active devices for data transmission between ESO with increased transfer capabilities. This includes nodes at control centers, at RSRs, at sites of the backbone optical ring (that provides redundant connection between control centers and RSRs), and at sites via which telecom lines with neighbor TSOs are enabled. These telecom nodes will be configured for higher bit rates and more data interfaces. Communication nodes will also be delivered and installed in all ESO-operated substations and large network consumer sites.

Activity 4 Complete Cybersecurity System
The complete cybersecurity system will improve the network and data systems' capability to counter a certain level of intervention compromising the availability, authenticity, integrity or confidentiality of stored, transferred or processed data or related services supported by, or accessible through, those networks and data systems. This approach will ensure complete protection of the ESO's digital infrastructure, thus also contributing to higher cybersecurity of neighbor TSOs.

Activity 5 Modernization of SCADA/EMS at NDC with Additional Functionalities at Redundant Power System Control Center
The aim of this activity is to upgrade the existent supervisory control and data acquisition system/energy system (SCADA/EMS) that is currently in operation at the National Dispatching Center (NDC) and serves for real-time monitoring and control of the Bulgarian power system. The system is approaching the end of its service lifetime and its replacement with a new SCADA/EMS featuring new functionalities will result in increased operational security and meeting the requirements for interoperability with the pan-European balancing platforms. These new functionalities, in line with the ENTSO-E requirements, should also be introduced at the redundant control center of NDC. Also replaced to this end will be SCADA/EMS whose service lifetime will expire by the time of commissioning of the new system. The new SCADA/EMS at NDC is envisaged to feature all software packages enabling ESO to perform its duties arising from the EU energy legislation for system planning purposes.

Activity 6 Display Walls
This activity is meant to replace the five display walls that are currently in service at NDC and at all four TDCs (Plovdiv, Pleven, Varna, and Sofia) with five new display walls, as well as the equipment of all five RSRs five new small display walls. The walls are installed at the control centers' and RSR buildings and are used to visualize information from SCADA/EMS at NDC, TDCs and RSRs. This includes line diagrams, tables and graphics needed by dispatchers and operators to make informed derisions while on duty. An immediate consequence will transpire into improved reliability and security of operational control and increased bit rate of process data exchange, which is required in order achieve a high level of visibility and dependability when operating the power system facilities.

Activity 7 Deployment of Virtual Desktop Infrastructure (VDI) for users in hybrid cloud

systems of ESO EAD to improve the remote desktop environment and ensure secure access for all employees of ESO EAD To implement this activity, new server configurations will be delivered in addition to expanding the data storage, deduplication and archiving system, the communication equipment, the server configuration license base, etc. Employees will also be trained to work in the new virtual desktop environment.

Activity 8 Modernization of the Electricity and Balancing Market Management System – needed for transformation of the overall transition toward digitalization within both ESO EAD and the entire national energy sector and to ensure optimal control and synchronized operation of the European electricity transmission system. This will make the balancing market and the power system as a whole fit to integrate increasing amounts of various renewable energy sources. Within this activity, a new market system will be implemented on a modular basis, including at least 11 types of new functionalities for the balancing market, an ancillary service and settlement system, including balancing energy pricing, covering all time horizons (annual, monthly, day-ahead, intraday, and real-time). This activity includes procurement and installation of hardware and software in a live (production) environment.

The software comprises at least the balancing market modules, the ancillary services system and the settlement system.

The hardware includes servers and a database, which is part of the telecommunication (information) infrastructure of ESO EAD and corresponds to the capacity of the electricity market in Bulgaria and the registered active trade participants.

Activity 9 Dynamic Transmission Capacity Monitor System – with increasing penetration of RES and their uneven distribution across the country, load flows on critical power lines need to be monitored dynamically to allow timely correction measures. This necessitates the introduction of a dynamic monitoring system, including procurement and installation of sensors and weather stations, as well as software for monitoring and assessing the transmission capacity of these power lines.

3. Beneficiary

Elektroenergien Sistemen Operator EAD (ESO)

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

The Programme will be implemented during the period 2021 - June 2026 according to the following indicative schedule:

	2021	2022	2023	2024	2025	June 2026
Activity 1:	V	V	V	V	V	V

[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.

Activity 2:		V	V	V	V	V
Activity 3:		V	V	V	V	V
Activity 4:		V	V	V	V	V
Activity 5:	V	V	V	V	V	V
Activity 6:		V	V	V	V	V
Activity 7:	V	V	V	V	V	V
Activity 8:			V	V	V	V
Activity 9:			V	V	V	V

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

The implementation of the activities within this project can start immediately after its approval in 2021. ESO EAD has signed framework contracts for procurement of plant and equipment and completion of Civil and Erection Works (CEWs), which makes it possible to commence the implementation of Activity 1 (82% of the planned activities and indicative costs) as soon as the project is approved.

5. Indicative financial resource by activity, including sources of financing (national budget, European funding, private funding, IFIs)

The indicative budged for implementation of the digitalization programme stands at BGN 511,000,000 in total.
The indicative cost estimation is based on the relevant amounts of current framework contracts for procurement of facilities, framework agreements and qualification systems for CEWs signed pursuant to the Public Procurement Act (PPA), as well as on accounted costs under completed contract with similar subject and scope, as follows:

- Activity 1 - current framework contracts for procurement of facilities, framework agreements and qualification systems for CEWs signed pursuant to the PPA, reported costs on contracts with similar subject;
- Activity 2 - framework contracts for procurement of facilities, framework agreements and qualification systems for CEWs signed pursuant to the PPA and under the EBRD, reported costs on contracts with similar subject;
- Activity 3 - framework contracts for procurement of facilities, framework agreements and qualification systems for CEWs signed pursuant to the PPA, reported costs on contracts with similar subject;
- Activity 4 - expert assessment and study on the implementation of cybersecurity systems by other bodies and institutions in the PPA system;
- Activity 5 - completed contracts with similar subject and scope, signed pursuant to the PPA and under the EBRD rules, plus expert evaluation and market study;
- Activity 6 - completed contracts with similar subject and scope, signed pursuant to the PPA, plus expert evaluation and market study;

- Activity 7 - completed contracts with similar subject and scope, signed pursuant to the PPA and under the EBRD rules, plus expert evaluation and market study;
- Activity 8 – projects with similar subject and scope, signed contracts under international programmes and the PPA;
- Activity 9 - contract of the Technical University - Sofia on FLEXITRANSTORE project under the PPA co-financed under grant agreement 774407 from Horizon 2020 Programme.

An exhaustive list of current framework contracts for deliveries, framework agreements and qualification systems and their relevance to the activities is given in section 7. The indicative budged is realistic since it is entirely based on actual costs of contracts that are implemented to their full scope and in accordance with the corresponding contractual conditions. The indicative costs are proportional to the expected benefits of the actions and their contribution to the national renewable integration targets by structuring the electricity market in line with the applicable European legislative framework.

The expected EU funding with RRF funds amount to BGN 467,000,000 of the total costs for this project. ESO EAD is planned to contribute up to 9% of the project funding with own resources. The own resources will ensure the complete achievement of all set targets.

The indicative allocation of the funding resource per activity with envisaged operational transfer for costs between activities:

Activity	Total amount, BGN	Funding by RRF, BGN	Funding with own resources, BGN
Activity 1	378,000,000	345,442,860	32,557,140
Activity 2	5,000,000	4,569,350	430,650
Activity 3	63,000,000	57,573,810	5,426,190
Activity 4	8,000,000	7,310,960	689,040
Activity 5	6,800,000	6,214,316	585,684
Activity 6	3,345,000	3,056,896	288,104
Activity 7	28,600,000	26,136,682	2,463,318
Activity 8	15,000,000	13,708,050	1,291,950
Activity 9	1,830,000	1,672,382	157,618

Project management	1,425,000	1,314,694	110,306
Total	**511,000,000**	**467,000,000**	**44,000,000**

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

Activities 1,2, 3, 4, 5, 6, 8, and 9:

Construction/rehabilitation of infrastructure (CEWs) - 45%

Physical capital (procurement of plant and machinery) - 45 %

Human capital (skills improvement, requalification …) - 5%

- Technology (costs for acquisition of intangible fixed assets – patents, SW…) - 5%

Activity 7 Development of Virtual Desktop Infrastructure (VDI) - BGN 30 mln.

- Physical capital (procurement of plant and machinery) - 82 %
- Human capital (skills improvement, requalification) - 3 %
- Labor (costs for remunerations, consultancy services, deployment) - 2 %
- Technology (costs for acquisition of intangible fixed assets – patents, SW…)– 13 %

6. Indicators

6.1. Result indicator/s

- **Capacity increase of at least 4000 MW to integrate new renewables to the power system**

Initial value as of 2021 - 0 MW
Interim value as of Dec 2024 - 2000 MW
Final value as of June 2026 - 4000 MW

- **Capacity increase of at least 1000 MW to optimize the use of existing assets**

Initial value as of 2021 - 0 MW
Interim value as of June 2025 - 500 MW
Final value as of June 2026 -1000 MW

The comparison base for this indicator is assumed to be 2020 during which the aggregated export/import transmission capacities in a standard grid configuration are, on average, as follows: 2130/1930 MW (source: ESO EAD corporate website http://www.eso.bg/?did=292 and Transparency Platform (ENTSO-E) https://transparency.entsoe.eu/transmission-domain/r2/forecastedTransferCapacitiesMonthAhead/show?name=&defaultValue=false&viewType=TABLE&areaType=BORDER_BZN&atch=false&dateTime.dateTime=01.02.2020+00:00|UTC|MONTH&border.values=CTY|10YCA-BULGARIA-R!BZN_BZN|10YCA-BULGARIA-R_BZN_BZN|10YMK-MEPSO----8&direction.values=Export&direction.values=Import).

- **Negotiation of conditions for the project**

Final value as of Dec 2021 - 100%

6.2. Effect indicator/s

- Technical preconditions are in place to integrate increasing share of renewable generation and to meet the national target for renewable electricity in the gross end energy consumption. This indicator will be reported on the basis of capacities provided by ESO EAD for connection of new renewable generators to the power system.

7. Does the project require the opening of a procedure pursuant to the Public Procurement Act (PPA)?

Yes, the project will be implemented under procurement contracts based on tender process pursuant to the PPA. ESO EAD has signed framework contracts/agreements and active qualification systems for procurement of plant and equipment and for CEWs, which allows activities to start immediately once the project is approved.

List of current framework contracts/agreements and qualification systems signed as a result of tender procedures under the PPA that will be used for the project implementation:

#	Subject	End of validity period	Activity 1:
1.	Procurement of Central Signalling Devices - Modules	17.6.2021	Activity 1
2.	Procurement of Lot 2 - control type	22.10.2021	Where needed
3.	Procurement of Central Signaling Devices - Relays	15.6.2021	Activity 1
4.	Procurement of Indicators	2.7.2021	Activity 1
5.	Procurement of conductors and steel wires	26.2.2023	Where needed
6.	Procurement of CRs 40A/220V DC and 63A/220V DC	7.2.2023	Activity 1
7.	Procurement of Arc Reactors	19.3.2023	Activity 1
8.	Procurement of TM Module - SICAM	10.4.2021	Where needed
9.	Procurement of HV Surge Arrestors	21.4.2023	Activity 1
10.	Procurement of Ohmic Resistors	1.5.2023	Activity 1
11.	Procurement of Clamps and Accessories	4.4.2023	Activity 1
12.	Procurement of Inverters	23.4.2023	Where needed
13.	Procurement of Clamps	23.4.2023	Activity 1
14.	Procurement of Energy Meters 0,2	23.4.2023	Where needed
15.	Procurement of Energy Meters C	23.4.2023	Where needed
16.	Procurement of MV Circuit Breakers	13.5.2023	Activity 1
17.	Procurement of Cables and Conductors	16.5.2023	Activity 1 Activity 3
18.	Procurement of Polarized Relays	20.5.2023	Activity 1

19.	Procurement of Auxiliary Relays	20.5.2023	Activity 1
20.	Procurement of Fittings	2.4.2023	Activity 1 Activity 3
21.	Procurement of Installation Modules	11.6.2023	Activity 1 Activity 3
22.	Procurement of Electric Expendables	28.6.2023	Activity 1 Activity 3
23.	Procurement of Prefabricated Concrete Elements	4.7.2023	Where needed
24.	Procurement of 110kV Composite and Line Insulators	7.7.2022	Where needed
25.	Procurement of 220kV Composite and Line Insulators	9.7.2022	Where needed
26.	Procurement of Instrument Transducers	4.4.2022	Activity 1
27.	Procurement of 220/48 V DC Converters	15.7.2023	Where needed
28.	Procurement of TM Systems	15.7.2023	Where needed
29.	Procurement of NI-Cd Batteries	13.8.2023	Where needed
30.	Procurement of Energy Meters 110 κV	25.8.2023	Activity 1
31.	Procurement of HV Relay Protections and LCs	26.8.2023	Activity 1
32.	Procurement of HV 220/400kV Relay Protections	26.8.2023	Activity 1
33.	Procurement of TM Telecom Modules	29.2.022	Where needed
34.	Procurement of Energy Meters HV 220 and 400 kV	8.9.2023	Activity 1
35.	Procurement Emergency CBs , Mode Switches and Buttons	12.9.2023	Activity 1
36.	400kV Current Instrument Transformers	16.9.2023	Activity 1
37.	400kV Voltage Instrument Transformers	16.9.2023	Activity 1
38.	Procurement of Quick-response Relays, up to 20 ms	29.9.2023	Activity 1
39.	Procurement of Air-conditioning System	7.10.2022	Where needed
40.	Procurement of RS and RC Relays	14.10.2023	Where needed
41.	Procurement of 400kV Disconnectors	29.10.2023	Activity 1
42.	Procurement of HV OHL Fittings	6.11.2023	Activity 3
43.	Procurement of 110 kV Disconnectors	18.11.2023	Activity 1
44.	Procurement of 400kV Composite and Line Insulators	9.12.2022	Where needed
45.	Procurement of MV Switchgear	21.2.2023	Activity 1
46.	Procurement of MV Switchgear Lot 1	19.12.2023	Activity 1
47.	Procurement of MV Current Transformers Lot 2	19.12.2023	Activity 1
48.	Procurement of ALS Units for MV Switchgears	26.1.2024	Activity 1
49.	Procurement of Accessories	6.2.2024	Where needed
50.	Procurement of AVCs	20.2.2024	Activity 1
51.	Procurement of 10kV and 20kV Disconnectors	1.3.2024	Activity 1
52.	Procurement of Protection IEDs and MV Automations	28.2.2024	Activity 1

53.	Procurement of Industrial UPS with Gel Batteries	20.3.2024	Where needed
54.	Lot 1 Procurement of 48 V DC Current Rectifiers	23.3.2024	Where needed
55.	Procurement of 110kV Voltage Transformers Lot 2	31.3.2024	Activity 1
56.	Procurement of 110kV Control Cabinet Lot 2	31.3.2024	Activity 1
57.	Procurement of C&S Equipment for MV Disconnectors	2.6.2024	Activity 1
58.	Procurement of MV/0,4V Power Transformers	13.7.2024	Activity 1
59.	Procurement of 400kV Current Instrument Transformers	16.9.2023	Activity 1
60.	Procurement of 400kV Voltage Instrument Transformers	16.9.2023	Activity 1
61.	Procurement of 110 kV CTs Lot 1	28.1.2024	Activity 1
62.	Procurement of MV Surge Arrestors	27.11.2023	Activity 1
63.	Procurement of 400kV Disconnectors	29.10.2023	Activity 1
64.	Procurement of Data Cables	31.8.2024	Activity 1 Activity 3
65.	CIWs on buildings and sites of the electricity transmission network	23.02.2021	Where needed
66.	Procurement of MV protection IEDs Lot 1: Procurement of MV protection IEDs; Lot 2: „Procurement of Ohmic Resistance Connection Automation for Combined MV Starpoint Grounding of 110/MV Power Transformers ”; Lot 3: „Procurement of Overvoltage Automation”	1.3.2021	Activity 1
67.	Procurement of Surge Arrestors, Lot 1: "Procurement of Surge Arrestors for MV Switchgear"	29.7.2021	Where needed
68.	Procurement of MV Vacuum Circuit Breakers	29.6.2022	Activity 1
69.	Engineering, procurement and installation of CCTV, fire alarm, security signaling, and perimeter security systems at ESO sites	12.6.2025	Activity 1
70.	Structural analysis and anti-seismic reinforcement of buildings and facilities (structures)	13.6.2024	Where needed
71.	Land and hydrological surveys of construction sites and line infrastructure site	17.1.2022	Activity 1

72.	Construction, maintenance, rehabilitation and/or retrofitting of switchgears, buildings and sites on the territory of 110 kV, 220 kV and 400 kV substations; Lot No. 1 Construction, maintenance, rehabilitation and/or retrofitting of switchgears, buildings and sites on the territory of 110 kV substations	9.9.2024	Activity 1
73.	Construction, maintenance, rehabilitation and/or retrofitting of switchgears, buildings and sites on the territory of 110 kV, 220 kV and 400 kV substations; Lot No.2 Construction, maintenance, rehabilitation and/or retrofitting of switchgears, buildings and sites on the territory of 220 kV and 400 kV substations	30.8.2024	Activity 1
74.	Retrofit of MV Switchgears	20.6.2024	Activity 1 Activity 3
75.	New construction, maintenance and rehabilitation of HV OHLs, Lot 1: New construction, maintenance and rehabilitation of 60 and 110 kV OHLs	12.6.2023	Activity 3
76.	New construction, maintenance and rehabilitation of HV OHLs, Lot 2: New construction, maintenance and rehabilitation of 220 and 400 kV OHLs	12.6.2023	Activity 3
77.	Consultancy services under Article 166 of the Spatial Development Act, Lot 1: "Consultancy services under SDA Article 166 for construction of new or reconstruction or maintenance of existing line infrastructure/power lines for voltage levels of 110 kV, 220 kV and 400 кV"	4.4.2023	Activity 1
78.	Consultancy services under Article 166 of the Spatial Development Act, Lot 2: "Consultancy services under SDA Article 166 for construction of new or reconstruction or maintenance of sites/substations for voltage levels of 110 kV, 220 kV and 400 кV"	4.4.2023	Activity 1

New tender procedures under the PPA will be conducted for those actions and/or activities that still have no signed contracts.

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

99.8%.
0.2% of the financial resource has been allocated for project management.

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

The project will be completed as per following forecast schedule for tender processes under the PPA:

Commencement month (T0)+ … months	T0+ 3	T0+ 6	T0+ 9	T0+ 12	T0+ 15	T0+ 18	T0+ 21	T0+ 24	T0+ 27
Activity 1 - assignment under existent framework contracts	V	V	V	V	V	V	V	V	
Activity 2 - assignment under existent framework contracts/PPA processes		V	V	V					
Activity 3 - assignment under existent framework contracts/PPA processes		V	V	V					
Activity 4 - PPA processes		V	V	V					
Activity 5 - PPA processes	V	V	V						
Activity 6 - PPA processes				V	V	V			
Activity 7 - PPA processes	V	V	V						
Activity 8 - PPA processes						V	V	V	
Activity 9 - PPA processes							V	V	V

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.

Some activities under this project represent a natural continuation and upgrade of similar

projects implemented within ESO for modernization and digitalization of ESO (implementation of SCADA, Substation Automation Systems (SAS), Market Management System (MMS), Automatic Control of Generation (ICG), intelligent real-time monitoring and control of operating parameters, dispatch training simulator (DTS), disaster recovery center, transparency platform, etc.). The projects were implemented in the period 2014-2020 as part of the investment program of ESO and are co-financed by KIDSF.

This project builds on already completed investments of ESO within the National Investment Plan (NIP) of Bulgaria, in accordance with the Decision of the EC State Aid SA.34385 (2013 / N) - Bulgaria on the allocation of free allowances for greenhouse gas emissions in accordance with Article 10c of Directive 2003/87 / EC in exchange for investments in electricity generating installations and energy infrastructure (National Investment Plan under Article 10c of the Emissions Trading Scheme (ETS) Directive). The projects realized by ESO include construction of new and rehabilitation of existing substations and power lines belonging to the Bulgarian power system. The implementation of the current project for digitalization of the monitoring and management processes covers the entire national electricity system, including the rehabilitated and newly constructed facilities without overlapping already performed construction activities as part of NIP.

The implementation of the project for complete digitalization of the planning, management and maintenance activities in the Bulgaria electricity transmission network is a natural continuation of the development of ESO's assets, in order to increase the adaptability of operational management and the level of monitoring of the already well developed power system.

8.2. If similar projects are envisaged to be implemented under the Partnership Agreement programs, the centrally managed facilities of EU or the Just Transition Fund, outline the demarcation with this project.

For the period 2021-2030, ESO plans to implement an energy efficiency and modernization programme to be financed by the Modernization Fund, which is to be institutionalized in Bulgaria in line with Directive 2003/87/EC. The energy efficiency and modernization programme includes the introduction of cost-effective energy efficiency measures in substations, implementation of technical measures to reduce process losses in power lines, construction of new 400 kV power lines and substations, and establishment of an innovative "School of Power Engineers". The energy efficiency program does not include measures for digitalization of planning and management activities that will be implemented under this project.
At the same time, the implementation of this project in combination with energy efficiency and modernization projects will lead to complete transformation of the national electricity system, a basis for achieving the national goals in the package Energy - Climate package by 2030 and in the long run up to 2040/2050.

9. Does the project directly contribute to the implementation of any of the Council's Specific Recommendations addressed to Bulgaria in the framework of the European Semester in the period 2017-2020? Please describe how.

The project contributes to the implementation of Council's Specific Recommendations addressed to Bulgaria in the framework of the European Semester in the period 2019-2020. The project include investments in the field of green and digital transition, in particular in the domain of clean and efficient production and use of energy and resources, environmental infrastructure, contributing to gradual decarbonisation of the economy.

Moreover, the activities falling within the programme contribute, both directly and indirectly, to the achievement of the goals set in the Clean Energy for All Europeans Package, related to security of supply, integration of RES, power system security and resilience, efficient and transparent operation of the Internal Energy Market, especially in the context of the economic and social crisis caused by COVID-19.

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

Yes. The project will significantly contribute to the implementation of reforms through decarbonisation and reduction of greenhouse gas emissions in the energy sector, as well as to its digitalization and digitalization. In combination with the market reforms described below, the project will create a significant added value and contribute considerably to the implementation of national and European sectoral renewable energy policies by creating a market framework that promotes flexibility and innovation. A well-functioning structure of the electricity market is the key enabler for the entry of renewable energy sources.

In particular, the project is expected to contribute to the implementation of the envisaged electricity market reforms, which will accompany the transition to the new market model characterized by a high share of renewable production, an active role of demand response and a growing share of active consumers.

In the context of the European legislative framework and in particular the Clean Energy Package for all Europeans, a reform and adaptation of the electricity market is envisaged according to the new market model, with expected implementation by 31.12.2024.

The new European policy imposes market dynamics in the coming years, which will be characterized by:

• Mass introduction of new RES capacities, taking into account the set ambitious European and national goals;

• Reducing share of conventional production;

• Increased consumer participation. Member States should put in place measures to allow consumers to participate in the market directly or through aggregation. A possibility of creating aggregators and local energy communities (LECs) on the basis of open and voluntary participation is envisaged. Consumers are very important in achieving the flexibility needed to adapt the electricity system to variable and distributed electricity generation from renewable sources.

The reforms and policies referred to herein will lead to an increasing share of geographically dispersed renewable energy. Decentralized generation has a number of benefits, including the use of local energy sources, higher security of energy supply at local level, shorter transport distances, and reduced energy losses during transmission. In order to ensure the necessary security of supply, there will be an increasing reliance on the flexibility of different energy sources, which should be combined with digitalization, new storage technologies, heat pumps, electric cars or hydrogen, which will enable the much needed solid transformation of the energy system and its structure.

In order to ensure a smooth transition to and in the establishment of the new market model, the role of transmission system operators (TSO) is very important in ensuring security of supply. In the coming years, efforts should be invested to develop the transmission network to respond adequately to the growing number of integrated renewable sources.

The outlined project has a direct impact on the development of the transmission network potential by increasing the security of operational management, i the speed and volume of process information exchange needed to achieve the optimal level of security in the management of transmission system sites, increasing the degree of observability, control and management of power system assets, optimization of the operating modes of individual facilities and the system as a whole, increasing the safety of work, reducing the time for elimination of accidents, as well as reducing the system operation costs. In the long run, with increasing penetration of digital technologies as HV / MV substation control centers, the amount of information received from the MV network, where a large number of renewable sources are connected and continue to be connected, will increase. This in turn will increase the accuracy of forecasting and the level of generating capacity control flexibility, leading to better use of renewable sources in covering the load, reducing the usability of conventional thermal power plants and, as a consequence, to reducing greenhouse gas emissions .

11. Does the project contribute to the development of any aspect of sustainable economic development? Please describe how.

Yes. The project is in line with the principles and areas set out in the Annual Strategy for Sustainable Growth for 2021, contributing to the achievement of the set initiatives regarding the accelerated use of renewable energy sources, as well as their integration through modernized networks and increased interconnection.

In addition, the project creates conditions for the transformation of the electricity system and sector and the achievement of the EU goals in the field of clean energy in the long run to 2050.

12. Does the project contribute to the implementation of the objectives of the National Development Program BULGARIA 2030? Please describe how.

The project contributes to meeting the objectives of the National Development Program BULGARIA 2030, more specifically?

Axis of development No. 1 "Innovative and Intelligent Bulgaria": The project responds to, and addresses the main objectives of this priority, i.e. 1) improving the quality of human capital and 2) stimulating and accelerating the process of developing and implementing innovations in various sectors of the economy, incl. educational institutions, research centers, by improving the knowledge and skills of national human resources in the field of digital technologies in the field of energy

Axis of development No. 2 "Green and Sustainable Bulgaria": The project contributes to achieving a key objective of the priority, namely increasing resource and especially energy productivity, following the principles of the circular economy and stimulating the introduction

of low-carbon, resource-efficient and waste-free technologies by developing and implementing smart grids facilitating the integration of RES production in order to increase its share in final consumption in Bulgaria.

Axis of development No. 3 "Connected and Integrated Bulgaria": The projectis aimed at implementing this priority, meeting its grounded focus - building a modern and secure digital infrastructure, as a basis for offering more services through digital management and cooperation, and it contributes to the development of secure digital infrastructure in the Bulgarian energy sector.

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

The project contribute to meeting the objectives and priorities set out in the Integrated National Energy and Climate Plan, more specifically:

Energy Security dimension The project will contribute to achieving the goals set by Bulgaria in terms of energy security related to: increasing the flexibility of the national energy system; taking measures regarding limited or interrupted supplies from an energy source in order to improve the sustainability of regional and national energy systems; increasing network and information security (cybersecurity).

Internal Energy Market dimension The project will contribute specifically to the achievement of measures to increase energy system resilience and flexibility in relation to renewable energy production, in particular the envisaged measures related to smart grid development, clustering, consumption optimization, storage, distributed generation, distribution mechanisms, redistribution and downsizing, real-time price signals, including the introduction of intraday market connectivity and cross-border market balancing.

Research, Innovation and Competitiveness dimension The project's main goal is to introduce measures in the field of research, innovation and competitiveness, part of the Integrated National Plan "Energy and Climate" and in particular the planned smart grids development activities, including automated control of electricity systems, in order to ensure the highest quality power supply to consumers and maximize the use of energy from renewable sources, with the ultimate goal being to modernize and automate existing electricity networks.