



EU PROJECT: SUPPORT TO GEORGIAN STATE ELECTROSYSTEM IN IMPLEMENTATION OF NEW ENERGY SECTOR REGULATIONS IN GEORGIA

THE PURPOSE OF THE PROJECT

Electricity is a necessity, which makes our daily lives better. Without it, we could not turn on our computers or light up our homes. As soon as we get up in the morning, we switch on the light, grab a coffee from the machine, and listen to the radio, or watch television. This is all made possible through electricity.

Launched in February 2019, the 21-month EU-funded project aims to support the Georgian Government in its efforts to reform the electricity market in line with the provisions of the EU acquis and requirements of the Energy Community Treaty which Georgia signed on 14 October 2016. With the energy sector being one of the priorities of cooperation between the EU and Georgia, the timely and efficient implementation of these legal reforms is of particular importance. In the longer term, it is expected that these efforts will result in: a) a more stable and transparent investment climate in the electricity sector of Georgia; b) bringing a higher standard of consumer protection, so that consumers have access to reliable and affordable electricity, and c) ensuring the country's energy security.

The journey of electricity from energy production to its final destination - the power socket- is a long and sometimes complex one. It passes through various stages: from generation, to transmission, to distribution, until it is transformed into 220 volts and reaches the power socket. At this point, consumers have access to electricity to meet their needs .

FOCUS ON ELECTRICITY TRANSMISSION

The focus of the project is the electricity transmission sector. The Georgian State Electrosystem (GSE) is in charge of the transmission grid and plays a key role in ensuring national energy security through planning and development of an optimal electricity network, ensuring reliability of electricity supply and other functions.

Electricity transmission involves the bulk movement of electricity through the transmission grid, from the power plant or from electricity imports from abroad, to the distribution grid. A particularity of the transmission grid is the high voltage in which electricity is transmitted so that a large amount of energy can be transported over great distances with minimal losses. Furthermore, particularity of the electricity transmission, which is our focus, is ensuring national energy security.

Implemented by:

AREAS OF SUPPORT OF THE EU PROJECT

The EU project transferred to GSE experts knowledge and experience in the areas of security of supply, power system market, and power system planning. The project organised many training events, including study visits and practical workshops for GSE and other stakeholders in Georgia. The areas which were supported by the project are presented below.

Ensuring the Security of Electricity Supply in Georgia



Providing Georgian citizens with electricity twenty-four hours a day, seven days a week is a challenge. Ensuring that there is sufficient electricity in the system at any given time, that is not more and not less, is referred to as balancing the system. Balancing the system entails that electricity consumption and electricity generation always maintain a balance.

Keeping the transmission system stable, safe, and secure requires effortless operating infrastructure, continuous management of power flows and cooperation with partners (further transmission systems and distribution systems).

GSE is not only responsible for protecting the transmission grid from fluctuations but also for protecting it against high loads (demands). Lines and transformers can transmit only a limited amount of energy.

Operational planning aims to keep the grid stable and effective around the clock. This is refined on an ongoing basis: the expected grid situation is constantly recalculated for one year, one month, one week, two days and one day before real-time operation.

The grid control centre, as main operational planning body, works together with the grid operators in neighbouring countries to check whether the grid and the international interconnection lines can transmit the produced and traded volume of energy.

To prevent a grid element from overloading, GSE uses the n-1 rule, which means that if a grid element fails, all the other grid elements in the transmission grid must still have enough capacity to transmit the additional energy. Every few minutes, the automatic grid calculation simulates whether this rule is being upheld. If the n-1 rule is violated, lines or transformers are at risk of overloading, and the operators, like GSE, must take action to avoid overloading.

The operators at the grid control centre calculate the cross-border exchange that can be made available for electricity trade before live operation. The operators update in advance their planning based on the schedules provided by power plants and electricity traders, which contain both domestic and international electricity trading transactions.

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Regular modernisation and maintenance are required to ensure that the Georgian electricity grid remains secure and reliable. Modernisation and maintenance of the grid in line with EU standards are even more important today because of the large volume of electricity being produced and increased congestion.

Support in preparation of agreements with market players –clear, transparent and fair



Security of supply is ensured through interaction with several market players in the chain: electricity producers, transporters, distributors and customers. Each player in this chain must exercise their assigned role in accordance with market and system rules. The assignment of roles, tasks, and responsibilities must be governed by clear and binding legal relationships (TSO agreements) so that the players can engage in a market-oriented activity. The project supported GSE in preparation of such agreements.

Support in adoption of EU Network Codes - a set of harmonized rules for grid operation



The Third Energy package¹ was created by the Agency for the Cooperation of Energy Regulators (ACER) and the Association for of the Transmission System Operators in the Power and Gas sectors (ENTSO-E and ENTSO-G). ACER developed the framework guidelines on the basis of which ENTSO-E (for the power sector) processes network codes. These network codes define and harmonise countless regulations for the grid, including grid operation, grid connection, congestion management, and control energy. The network codes also form the basis for establishing a common European power market.

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The EU Network Codes are divided into three groups:

- *Market codes* move market integration forward for a more competitive market and resource optimisation. They define rules on power system markets where market players can hedge the risks associated with cross-border trading.

¹ On 3 March 2011, the third energy package came into force in the European Union as the new legal basis for the European energy markets, thus replacing the second package from 2003.

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- *Connection codes* set the EU-wide conditions for linking all actors safely to the grid, including renewables. The codes will improve security and foster new market entrants, technologies, and smarter grids. These codes are obligatory for Georgia from July 2021
- *Operational codes* reinforce security of supply through state-of-the-art, harmonised, and coordinated rules for operating the grid. Operational codes also establish common procedures and remedial actions to be applied in states of emergency, blackout and restoration.

Grid Planning - to ensure that grid infrastructure always meets consumer demand in Georgia



The operation of the transmission grid is based on long-term planning.

Power system planning or grid planning is an activity related to the development of plans for the design and construction of the system and its elements, which will satisfy forecasted future needs, starting from the present state. The plan represents a guideline to the operation of the transmission grid for the next period. It contains the possible energy infrastructure projects for the future which will help to achieve climate targets, integrate renewable energy source and ensure security of supply.

Planning ensures that the transmission infrastructure can deliver power from the generators to the loads (or demand), and that all equipment remains within its operating capacity in both normal operation and during system contingencies.

Power system planning may extend from typically six months ahead and up to ten years ahead or more, for long-term planning.

Initial forecasts for generations or for demands, revisions, repairs in the transmission grid the key economic factors provided by the governmental structures represent the main input for these plans. By performing detailed analysis so that the consumer demand is met without creating contingencies, the final plan is made public.

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