

PROSPECTS FOR THE DEVELOPMENT OF SMART GRIDS IN BELARUS

Lepecho M.V., student
Scientific supervisor – Brechko D.S., lecturer
English language department №1
Belarusian National University of Technology
Minsk, Republic of Belarus

In our world, every day different people in various concepts complicate their lives by introducing some new technologies. Energy is no exception.

To use energy as efficiently as possible, a system called Smart Power Grids was invented. Smart Grid is an electricity transmission system that independently monitors and distributes electricity flows to achieve maximum energy efficiency. When creating intelligent energy systems, engineers must solve problems of energy management, data transmission and information analysis. The introduction of Smart Grids in the energy sector of Belarus is only gaining momentum, a plan for promoting the system is currently being prepared [1].

This technology is still in its period of formation, so all its advantages and disadvantages have not been revealed. This leads to the reluctance of many enterprises to actively implement the system. Anyway, their use is necessarily, since scientific progress does not stand still, and the development of artificial intelligence is gathering pace. Every year the growth of energy consumption increases, this can have a negative impact on the country's economy, therefore the introduction of intelligent networks will gradually become a necessary requirement. For instance, in the United States, where the development of new technologies is a very important task, smart networks have helped save money through smart energy use [2].

Smart Grids offer a large number of benefits that are profitable for the energy sector of Belarus. Firstly, this technology provides information about energy use to end users, which helps people to understand their energy consumption better, as a result, energy consumption is economical. Secondly, it increases the more economical and intelligent operation of the electric power system, reducing energy losses. Thirdly, the work

of Smart Grids will entail an increase in the efficiency of the processes of production, transmission, and use of energy, that is, the amount of energy produced should be equal to the amount consumed.

Except industrial enterprises, the widespread introduction of Smart Grids is expected in the housing and utilities sector, as a large percentage of energy is used for heating, cooling and lighting buildings. In this case, the system can also help eliminate some power outages at times of greatest consumption. Another important advantage is the use of the system in renewable energy sources (solar and wind). These sources have some nuances in work, for example they depend on weather conditions, which are always very changeable. To solve this problem Smart Grids monitors weather changes in real time, collecting information such as wind speed, temperature, humidity, to optimize the performance of wind turbines. In solar energy, the problem is variable cloudiness, which causes uneven solar energy production, then the system can help regulate fluctuations in production, provide a stable power supply.

Having analyzed this, it can be concluded: increasing the productivity of energy production by renewable resources will be able to gradually displace fossil resources (which tend to run out), thereby improving the ecological state of the planet.

Based on the experience of other countries that have used Smart Grids, it can be inferred, that the implementation of this technology is fully justified both economically and in terms of future use. Belarus should not ignore this system, because due to the climate we are not adapted to the use of wind and solar energy at the moment, and Smart Grids will help to rationalize this and gradually make renewable energy sources one of the main sources. Therefore, Belarus will become more environmentally friendly.

References

1. Короткевич, А. М. Умные распределительные электрические сети 0,4-10(6) кВ в Белорусской энергосистеме – первый шаг / А. М. Короткевич, В.П. Колик, Е. В. Кулаковская // Энергетическая стратегия. – 2011. – № 5. – С. 27-29.

2. Smart Grid's role in energy transition and the top five market leaders // Smart Energy International. – URL: <https://www.smart-energy.com/industry-sectors/smart-meters/smart-grids-role-in-energy-transition-and-the-top-five-market-leaders/> (date of access: 20.03.25).