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**PROSPECTS OF INNOVATIVE POWER ENGINEERING
OF UZBEKISTAN: «SMART» ELECTRIC
NETWORKS – SMART GRID**

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Summary. The article presents the prospects of innovative development of the energy sector of Uzbekistan on the basis of «smart» electrical networks.

Keywords: «smart» electrical networks; prospects of innovative development; energy sector; electric power industry; modernization; management; Smart Grid.

The new conditions of electric power industry, such as the reform, environmental challenges, increasing demands for technological and institutional As the industry determined the reliability of the systems in most developed countries, the transition to the modernization of the power on the basis of innovative organizational and technological platform of building a “smart energy networks” or “Smart Grid” in the English literature [1–5].

The term Smart Grid is still no generally accepted interpretation. Thus, in accordance with the treatment [1; 2], Smart Grids are understood as “electrical networks that meet the future demands on energy-efficient and economical operation of the power system through the coordinated management and using modern two-way communications between the elements of power grids, power plants, and accumulation units consumers”.

The creation of such system in Uzbekistan is a necessity due to the significant complication of the tasks of the structural organization and management in the power industry in the conditions of reforming, the growing demand for energy services in their qualitative and quantitative form, the new demands of society to environmental, social and institutional form of energy. There are new requirements for the fuel and energy balance in the organizational structure of the electricity industry, to optimize the intersystem flows base and variable species, which, in turn, determines the need to develop an active-adaptive network (transmission and distribution power lines and automated control systems).

Smart Grid – is the basis for a conceptual model of energy that would result from the coming years as a result of future developments.

It is about creating a unified sound and efficient “intelligent power system”, characterized by a high level of information, “digitalization” of automation and interactive, with tight integration of measurement, information and communication, computer and control technologies in the energy system.

In the short term, the creation of Smart Grid will effectively stimulate the development of related industries such as the production of “smart electric meters”, the creation of digital transformer substations, system integration, development of measurement systems, and the industry of alternative energy sources.

When creating a “smart grid” will mainly focus on areas such as the reduction of harmful emissions and energy efficiency, safety and stable operation of electric power systems, improving the reliability of power supply. A previously conducted such preparatory activities such as computerization, the creation of an “intelligent” system of supervisory control, increasing the functionality of the control, laid the foundation for building a “smart energy networks”.

Investments in the development of the Smart Grid in some countries of the world [2].

The promise of this innovative development of future energy investment can be seen (Table) that allocated in some countries of the world in 2010.

The development of Smart Grid in fact related to the objective and the need to make tough energy much more efficiently

in the face of increasing energy consumption and limited energy resources. Implementation of the model of the Smart Grid in the energy system of Uzbekistan will not only optimize the existing algorithms for the generation and transmission of energy, will increase its use of alternative sources, but also lead to a significant change in the energy companies themselves [5–9].

Country	The total investment, billions of dollars
China	70
USA	19
India	10
The European Union	7
United Kingdom	3
Australia	1
Canada	0,5
South Korea	0,3

Among the most significant changes in the economy, affecting, in particular, the energy industry, foreign scientists and researchers include the following [2–4].

1. Deficiency of electrical power sources.
2. The ever-increasing demands on the reliability and quality of electricity by consumers.
3. The constant increase in the cost of electricity in the world: in spite of the policy of containment of electricity rates, it continues to rise.
4. Aging and the growing shortage of skilled workers in the energy industry.
5. Increased demands of the stakeholders to the results of the power companies.
6. The requirements of environmental and industrial safety of the power plants.
7. Reduction in system-wide costs.

Usually complex Smart Grid includes the following specialized industry:

- “Smart” electric power generation,
- “Smart” power transmission,
- “Intelligent” conversion of electric current,
- “Intelligent” power,
- “Smart” remote monitoring and control, based on the information technology and telecommunications.

By studying the approaches to the development of “smart energy networks” in foreign countries can be concluded that

there was a systematic approach to the practical implementation of programs to improve energy efficiency at the state level.

Thus, we can conclude that the improvement of energy efficiency of power industry of Uzbekistan should be oriented not at the implementation point of the projects connected with some limited segment of the power system, but to provide an innovative, comprehensive approach to energy modernization, which includes the development and production of a new generation of equipment for the generation and distribution of electricity, widespread use of information and communication technologies in the management of networks, the introduction of new user interface based on the principle of interactive interaction with companies-suppliers, as well as the integration of alternative energy resources.

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