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Consideration of a New Phase of Development Distributed Energy Generation Using the Energy of Renewable Sources

Ishankhodjaeva N.U.

Assistant of the «Electromechanics and Electrotechnologies» department, Tashkent State Technical University named after Islam Karimov, Tashkent, Uzbekistan

ABSTRACT: The article describes the development of a relatively young area of distributed energy generation using renewable sources, aspects of this method and their positive impact on the development of this industry.

KEYWORDS: Small energy, renewable sources, distributed energy generation.

I. INTRODUCTION

Transition to a new stage of development, a worldview on the nature of the receipt, consumption and distribution of electricity. The vast and large system is gaining more and more flaws and the inability to supply all consumers with quality energy. Energy transition from the traditional understanding of power systems to new technologies that offer tons of implementing decentralization, intellectualization of power supply systems, in which will participate consumer himself. The use of all types of energy resources, the accompanying increase in energy efficiency, quality and reduction of negative impact on the environment.

II. DISCUSSION

If we consider that for energy we use coal, natural gas, fuel oil, then if we consider this object as a single producer of electricity, then we get only 40% of the efficiency. If we consider the object is also a producer of heat that we get in this case, 80% efficiency, bearing in mind that this is a cold time of year is 80% efficiency is an impressive fact to use. If we consider this object in the summer, then 40% of the efficiency is very low, and heat transfer is very specific as it must be located close to consumers, otherwise it will not be effective.

A new look or a breath of air, which today is very acceptable and beneficial for remote areas, is the distribution of energy generation (RGE), which includes a set of power plants located close to the place of energy consumption and connected directly to the consumer. EWG has often been used as a backup source of energy to increase reliability or as a means of deferring investment in transmission and distribution networks, reducing line losses, replacing costly power grids that provide alternative sources and provide environmental benefits. [1] The type of fuel used in our region is the source of primary energy, renewable energy, which is supported by the regulatory framework. Distribution energy does not require large structures, additional step-up transformers, personnel, etc. All this is designed for small generating capacity (up to 25 MW).

The main element of distributed generation is small energy, which includes small generating units and complexes, including those not connected to centralized power grids, operating on the basis of traditional fuels and renewable energy sources. Many types of power plants using renewable energy sources (RES), primarily wind power plants (wind turbines), are also referred to small power engineering [2,3]. Small gas turbines, combined cycle plants and wind turbines are installed directly at the consumers and are connected to the distribution electric network at voltages of 6-35 kV. These facilities are called "distributed generation" [4-5].

Significant successes in recent years have been achieved in the creation of control systems for the distribution of energy generation - this is a correction system on the side of the generation of consumer regulation, automation controls

(intellectualization of the system). Which allows you to synchronize the work of distribution energy generation systems with the modes of operation of consumers, among themselves and with a centralized system?

The main factors encouraging the development of distributed generation power, are:

- adaptation of consumers to market uncertainties in the development of the electric power industry and in electricity prices; this helps to reduce the risks of power shortages and increase energy security;
- increasing the adaptive capabilities of the EPS itself to the uncertainty of market conditions for economic development and thereby reducing investment risks;
- the emergence of new highly efficient energy technologies (GTU and CCGT);
- increase in the share of gas in the fuel supply of power plants;
- toughening environmental requirements, stimulating the use of renewable energy (hydropower, wind, biomass, etc.) with the protectionist policies of states.

Potential of renewable energy in Uzbekistan

Energy resources	Potential		
	Theoretical	Technical	Mastered
Hydro	9.2	1.8	0.6
Solar	50,973.0	176.8	-
Wind	2.2	0.4	-

Renewable energy sources are most widely used in countries with active environmental regulation, which includes a system of legislative, administrative and economic instruments. These tools are used at the state and municipal levels to stimulate emission reductions (not just energy plants). This approach is typical for the countries of Scandinavia, Denmark, Austria, the Netherlands, Germany, and the USA. Renewable energy incentive policies are beginning to be developed in Uzbekistan. The regulatory framework for the development of renewable energy has been adopted.

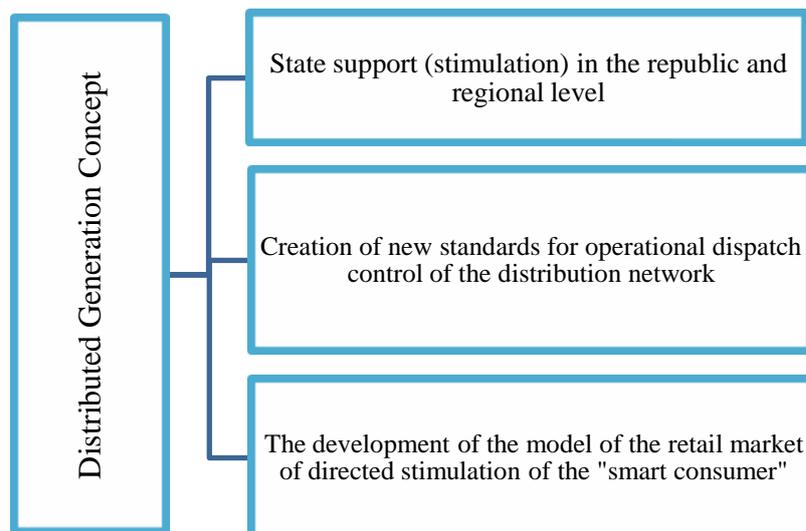


Fig. 1 The Concept of Distributed Generation [6]

The advantage of distribution generation:

- regardless of centralized generation facilities;
- focus on local primary energy sources;
- the ability to work on low-grade fuels, waste with low CO₂ production.
- in conjunction with centralized generation, the creation of the intellectualization of a network or Smart Network



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Disadvantages of distribution generation:

- a) instability
- b) high requirements for a system that ensures the quality of the generated energy;
- c) in some cases, the increased cost of energy.

III.CONCLUSION

Along with this, the territorial features of Uzbekistan provide huge opportunities for using distributed energy generation. Distributive energy generation with intellectualization opens up completely new prospects for increasing energy efficiency and the formation of optimal energy balances. If we take into account the many-fold increase in demand for electricity by 2030, distribution energy will provide up to 75% of new connections during electrification. Basically, distribution generation is the main source of energy for remote and inaccessible areas, where its deficit is a constraining factor for the development of this area. The increase in the share of distributed generation in EES not only has positive aspects, but also creates certain technical problems that are associated with changes in the properties of systems and their control capabilities in normal and emergency conditions. These problems are solved, however, dispatch and automatic control of EPS are complicated, new mathematical models are required to justify the development of EPS and power supply systems, analysis of their modes and their management.

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