

ON THE POTENTIAL OF USING ALTERNATIVE ENERGY SOURCES IN SHAPING THE ENERGY EFFICIENCY OF BUILDINGS

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ABSTRACT

The article provides information about the directions of development of modern energy based on the use of renewable energy sources. This is caused by a gradual decrease in natural resources, rising prices for them.

Keywords: renewable energy sources, alternative energy, energy saving, energy efficiency of buildings.

The most characteristic direction in the development of modern energy today is the use of non-renewable energy sources. The main energy carriers include oil, gas and coal. Due to the decrease in the reserves of traditional energy sources and the gradual increase in their cost, an increasing number of countries are beginning to look for new ways to solve this problem. In many countries, the use of non-traditional renewable energy sources has a significant share in electricity and heat supply.

According to experts, buildings have the greatest potential for saving energy. Therefore, to solve this issue in modern construction, two directions for increasing the energy efficiency of buildings are mainly used: energy saving and the use of alternative energy sources.

Currently, several types of energy efficiency improvements are used in buildings. The first type includes passive houses, in which, as a rule, the main energy savings occur due to the thermal insulation of the building. The second type is considered to be houses with zero energy consumption, the main energy saving measures of which are the use of alternative energy sources. The third type of structure, called active houses, provides energy savings by insulating the building and connecting alternative energy sources.

In Uzbekistan, at this stage, one of the important tasks is the use of renewable energy sources (RES). This is dictated by a number of factors, which include the predominance of a harsh climate in most of the territory, requiring significant energy costs for heating and maintaining buildings, and the presence of vast lands, which make it difficult to ensure reliable and efficient energy saving throughout the territory.



The main alternative sources include the energy of the sun, wind, moving water, heat from the earth and biomass energy. At the same time, it should be taken into account that energy supply using renewable energy sources, called "regenerative energy" and "green energy" generated by natural sources, has a minimal impact on the environment. However, the use of alternative energy sources is associated with uneven energies in the time of the day, day, year.

The energy of the sun can be converted into electricity and heat energy, for which several methods can be used; photovoltaics, solar thermal energy, hot air power plants, solar balloon power plants; passive or active circuits are applied using thermodynamic, photoelectric and other methods. The methods used are based on the operation of a large surface that collects flows for processing and accumulation in batteries.

The direct use of solar energy in buildings is provided by solar systems and their components - solar modules (batteries, panels, collectors). The following classification of solar installations is common:

- according to the method of converting solar energy (heating of the coolant, electrochemical, photoelectric, barogalvanic, etc.);
- in the form of solar collectors - flat and concentrating;
- by type of coolant (water, air).

Solar systems allow you to direct the accumulated radiant energy of the sun for heat supply, for hot water supply, for generating electric current, for cooling, desalination, etc. However, the efficiency of solar panels depends on a number of factors: the temperature of the outside air and the surface of the battery; the angle of incidence of the sun's rays; the presence or absence of an anti-reflective coating; light output power. For example, the maximum performance of a panel is possible when light falls on it at an angle of 90°.

Since the efficiency of wind turbines depends on wind speed, it is advisable to combine a wind generator together with solar panels. Water energy is traditionally used to generate electrical energy. In connection with the problem of preserving the environment, reducing the impact on the environment of existing turbine HPPs, the creation of small hydropower (mini and micro HPPs) is recognized as one of the effective areas for the development of alternative energy. The principle of operation of mini- and micro-hydroelectric power stations practically does not differ from the operation of high-capacity stations; based on the use of water pressure. Small hydroelectric power plants are distinguished: damless, sleeve, garland design with hydraulic propellers, a water

wheel with blades, a vertical Darier rotor, an underwater propeller - a "windmill".

The energy of the earth is also considered as an alternative source of energy and is used for heating buildings in winter and air conditioning in summer. There are several ways to generate energy: thermal power plants (groundwater energy extraction - hydrothermal energy), ground heat exchangers (groundwater heat recovery - petrothermal energy) using geothermal pumps, air collectors, vertical and horizontal collectors.

The processing of organic waste into biogas with further generation of electricity (biogas energy) is also a possible alternative to natural gas and centralized power supply. Biofuels are classified depending on the methods of its production, state of aggregation and types of use. Solid types of biofuels include firewood, fuel briquettes or pellets, gaseous ones are biogas and biohydrogen, and liquid ones are bioethanol, biomethanol, biobutanol, dimethyl ether and biodiesel.

The field of alternative energy today is actively developing in many countries. This is due to the gradual decrease in the amount of exhaustible natural resources and due to the constant increase in their prices. In Uzbekistan, at the moment, a small number of construction projects use alternative energy. This is due to the presence of large reserves of minerals sold for the purpose of traditional energy supply. However, our country has great potential for the use of renewable energy sources, based on the diversity of climatic zones, terrain and the presence of a large area of territory. Therefore, for the active use of alternative energy in Uzbekistan, an appropriate legislative framework is needed, the development of a specific tariff system and the organization of the process of concluding contracts for the purchase of energy by the state are necessary.

Despite the advantages of energy-efficient buildings, they have one significant drawback in common - the cost of construction is about 20% higher. However, making a significant financial investment to create this type of building will pay off over time. The main factors on which the payback period depends are: the size of the tariff for energy resources and the amount of savings in utility resources.

Thus, based on the analysis of the literature on the main aspects, we can conclude: the electric power industry is one of the leading industries, on which the level of development of the country's economy largely depends; it is too early to talk about the complete replacement of traditional reserves with alternative energy sources; it is not enough to talk about the introduction of new methods, you need to make sure that they really work.

Based on the totality of the data obtained, it can be concluded that a combination of traditional methods of generating energy with alternative ones can contribute to the development of the economy of Uzbekistan.

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