RENEWABLE ENERGY SOURCES IN THE WORLD Oleksandra Zozulenko,

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Our world faces the need to meet the growing demand for electricity, taking into account the ecological situation and the need to protect the environment. Combustion of fossil fuels at thermal power stations leads to emissions of harmful substances, such as sulfur and carbon dioxide gases, nitrogen oxides, dust, soot. Mining of coal and peat changes natural landscapes, and oil spills during mining and transportation can destroy life in large areas (water areas). And the question of the need for renewable energy sources is more relevant than ever.

"European countries have actively switched to renewable energy sources. In 2020, their share was 37% of the total electricity consumption," Eurostat reports. Among renewable sources, wind energy and hydropower account for more than two-thirds. In Scandinavian countries, such as Norway and Iceland, the share of renewable sources exceeds 100% – that is, they produce more green energy than they

consume.

Among renewable sources, wind energy and hydropower account for the most more than two-thirds. It can be concluded that this is facilitated by the ideal terrain, for example, Norway with mountains, rivers and waterfalls, allows the construction of hydroelectric power plants without large dams, using natural lakes as reservoirs.

Hydroelectric power is produced by converting the potential energy of water into kinetic energy, which turns turbines, which then transmit mechanical energy to a generator, which converts it into electricity. Among the advantages of such production can be noted stability and renewable, and among the disadvantages, it is necessary to consider only the ecological impact and take into account the influence on the river regime and changes in the ecosystem.

Wind energy is another popular resource in European countries. Wind energy is obtained with the help of wind turbines (wind farms), which have giant blades that rotate under the influence of the wind. This rotation generates mechanical energy, which is then converted into electrical energy using generators. They are placed in open areas, coastal areas and offshore platforms where the winds are strong and stable. The plants have low operating costs and low emissions, but the operation of wind turbines depends on the presence of wind, which makes production unstable and requires large areas for construction.

Solar energy is growing most dynamically – if in 2008 it accounted for only 1% of energy consumption, now this indicator has increased to 14%. Solar energy is generated through the photovoltaic effect in solar panels, where light is converted into electrical current. However, in many parts of Europe, especially in the north, solar radiation is less intense compared to other regions of the world. This limits the efficiency of solar panels.

The next most popular is bioenergy. It uses organic materials, such as plants and waste, to produce energy. The two main types of biofuels are biodiesel, which is made from vegetable oils and animal fats, and ethanol, which is made from sugar or starchy plants. Biofuel is used in transport and for the production of electricity and heat at specialized power plants. Geothermal energy is less popular in the world. It is obtained from the heat of the inner layers of the Earth through geothermal power plants. There are two types of stations: with steam and water turbines. Geothermal reservoirs are common in regions with hot springs, such as Iceland, New Zealand, and Kenya. Geothermal energy is also used for space heating and hot water in some regions, but it may not be economically viable for many countries. Drilling wells and installing geothermal plants requires significant financial investments.

To summarize, renewable energy is an important topic of discussion as it offers sustainable and environmentally friendly alternatives to traditional fossil fuels. In Ukraine, renewable energy sources have significant potential for development, especially in the context of the current challenges of energy security and environmental sustainability. Understanding the advantages and disadvantages of each type of alternative energy is key to choosing an optimal and efficient energy future.

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