OVERVIEW OF THE WIND ENERGY MARKET IN UKRAINE

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Introduction. The growing interest in energy resources is associated with global warming and the consequences of the greenhouse effect. Today people understand that the reserves of fossil fuels are limited and the use of such fuels leads to environmental pollution (Bezgina, Strelina, 2013). The purpose of this study is to analyze the wind energy market in Ukraine.

Presentation of the main research. In the transition to sustainable energy, one of the main factors is the reduction of greenhouse gas emissions. Specific greenhouse gas emissions from alternative energy sources are hundreds of times lower than traditional ones (WEO, 2021). Greenhouse gas emissions from energy production, taking into account emissions from the manufacture of equipment at wind power plants, are 4 times lower than at solar power plants and dozens of times lower than at processing coal and oil gas.

To achieve the goal of reducing greenhouse gas emissions, it is necessary to increase the share of renewable energy sources. Solar, wind and biomass energy can meet local energy needs and help improve the environment. Wind energy has one of the largest increases in installed capacity over the past 20 years (IRENA, 2021). Wind energy is the cheapest renewable source. In places with good wind conditions, it competes successfully with traditional fuel and nuclear power plants. The development of wind energy in Ukraine is promising for the following reasons: there are many territories with high wind energy potential; Ukraine is the only one country of the former USSR and Eastern Europe that produces wind power equipment; more than 10 years of experience in the design, construction and operation of industrial wind farms; there is legislative support for the use of renewable energy sources (Konechenkov, 2017).

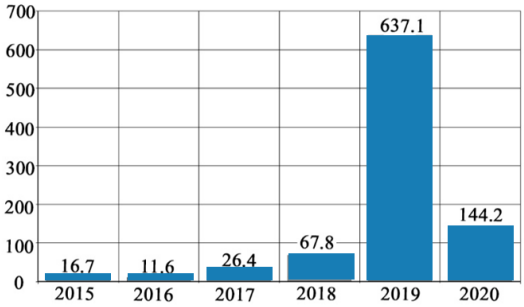
Since 1997, when the Comprehensive WPP Construction Program was adopted, wind energy in Ukraine has received state support in the form of a surcharge on electricity tariffs and direct financing. In 2008, the Verkhovna Rada introduced a "green" tariff for electricity obtained from alternative sources. The document stipulated that Energorynok should buy such electricity twice as much as that obtained from traditional sources. In this way, the government planned to attract foreign investors and stimulate industrial electricity production through wind turbines. Significant growth in the construction of wind farms has been observed since 2009, after the introduction of the "green" tariff by the Government of Ukraine. International and national investors continue to be interested in investing in wind energy projects and developing Ukraine's investment attractiveness and business climate. In 2020, the volume of investments in the wind energy sector amounted to 154 million Euros, which is more than 6 times less than in 2019 (UWEA, 2020) However, it can be stated that the general trend of investing in new wind energy projects remains. In the last 5 years, a total of about 2 billion euros has been invested in the wind energy industry.

At the end of 2020, the installed wind power capacity in Ukraine reached 1,314.1 MW. Wind power plants delivered 3,251.6 mln kWh of "green" electricity to the Integrated Power System of Ukraine in 2020, or 2.2 % of the total annual electricity generation in Ukraine. Compared to 2019, in 2020 the national wind energy sector was enriched by a much smaller number of new capacities (see Figure 1). In 2020, only 144.2 MW of new wind power capacity was put into operation in four regions of Ukraine, and the total capacity of the wind energy sector of Ukraine reached 1,314.1 MW. At the newly built wind farms, 36 megawatt-class wind turbines began to generate clean electricity. The average unit capacity of new wind turbines is 4 MW.

National Renewable Energy Action Plan, which provided for the achievement in 2020 of 11% share of RES (including high-capacity hydropower) in the national electricity generation. The National Renewable Energy Action Plan until 2020 has a clear annual plan for the development of each renewable energy source. In particular, by the end of 2020 it was planned to put into operation 2,280 MW of wind capacity in the country.

Figure 1

Annual wind power additions, 2015 – 2020, MW (compiled from data of UWEA, 2020)



However, a t the end of 2020, only 1,314.1 MW of wind power capacity was installed in the country, including 138 MW of wind power capacity located in the temporarily occupied territories of Ukraine (certain districts of Donetsk and Luhansk regions), which currently do not supply electricity to the Integrated Power System of Ukraine. That is, the goals for the installation of wind energy capacity have been met by only 57%. In the first half of 2021, the trend towards a gradual increase in the unit capacity of wind turbines continues. The average unit capacity of new wind turbines put into operation in the first half of 2021 is 3.8 MW, while the average unit capacity of wind turbines installed in Ukraine since 2011 is 3.4 MW. The participation of wind power equipment manufacturers in the wind energy market of Ukraine also remains stable. Thus, at the end of June, the three leading manufacturers of wind power equipment, whose turbines are installed in the country, include the Danish company Vestas, the American company General Electric, and the Ukrainian company "Wind Parks of Ukraine" (UWEA, 2020).

Wind energy opens such opportunities for Ukraine as:

- step towards integration into the world energy system;
- the ability to improve the environment by reducing the impact of anthropogenic factors on the environment, which leads to the disruption of natural ecosystems;

- given the constant rise in energy prices - the possibility of reducing the negative socio-economic consequences of this process through the development of socially available energy sources, and as a result, improving living standards;
- the possibility of introducing new scientific, strategically important state, as well as commercial infrastructure projects and the development of the energy structure in general;
- strengthening and improving the energy system of the state;
- diversification of alternative energy resources (wind energy in particular) increases the economic potential of the country.

Conclusions. Without effective world and European experience, attracting foreign investment and modern technologies, the national economy and territorial communities of Ukraine are unlikely to be able to implement the energy priority of sustainable development, harmonization of current livelihoods, industries and environment. Incentives for the development of wind energy projects may be provided by law for medium-term tax and customs preferences, exemption from land tax and income tax of energy suppliers that have been produced by wind equipment.

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