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IMPLEMENTATION OF ALTERNATIVE (WIND) ENERGY SOURCES IN UZBEKISTAN

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ABSTRACT: The article provides information on the work carried out in the Republic of Uzbekistan on the use of wind energy, which is one of the alternative energy sources.

KEYWORDS: Alternative energy sources, wind energy, water energy, electricity, wind energy device.

INTRODUCTION

In the world today, along with solar, organic waste and water energy, wind energy is developing at a high pace, which is a constantly renewable and, in this sense, an eternal source of energy that originates from the activity of the sun and is created as a result of it. The European Union countries are leading in this regard. The annual rate of wind energy utilization in Europe is 33-34%, and by 2004, the installed capacity of wind turbines reached 28.4 GW, while the installed capacity of all wind turbines in the world was 74,223 MW at the end of 2006.

THE MAIN RESULTS AND FINDINGS

The theory and methods of using wind energy were developed in the 1950s, and the first wind energy devices in the republic were used in 1983 by livestock farmers of Tomdi district of Navoi region. Production and use of biogas at the expense of livestock manure and residues of agricultural products has been implemented since 1987.

Wind energy can be used for lighting, television and radio, communication equipment, water extraction, heating and many other purposes. The use of wind energy to provide electricity, heat and drinking water to people living in ecologically vulnerable areas such as the Arolboi region, as well as to those places far from electricity, natural gas, and hot water supply, without drinking water supply, in desert, desert, and mountain areas. it works well.

In the 80s of the last century, several wind energy generators were used in Navoi and Bukhara regions, and experience was gained in this regard. For the first time in Uzbekistan, the state joint-stock company "Uzbekenergo" and the Korean "Doojin co. Ltd" company installed the largest

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wind power plant in the recreation area of Chervok reservoir of Tashkent region. A 40-meter anemometric tower with a power of 750 kWh produces 12.3 million kWh of electricity in a year. Also, this wind power plant allowed to produce an additional 2.3 million kWh of electricity per year, and as a result, 700,000 m3 of natural gas is saved.

The device was established on the basis of the decision of the President of the Republic of Uzbekistan dated December 15, 2010 "On the priority directions of the development of the industry of the Republic of Uzbekistan in 2011-2015" No. PQ-1442.

The main contractor of the device was designated as the Chinese company "Xian electric engineering" and the project documents were developed by "Gidroproekt" JSC.

The total cost of the project is 1.85 million US dollars, of which 220,000 for construction and installation works, 763,133,000 for equipment, 278,600 for transportation costs, 425,000 for crane rental, and 153,000 for installation and adjustment works. funds in the amount of dollars were spent.

The construction work of this experimental wind power plant began in September 2011 and was commissioned in September 2017 on the eve of the 26th anniversary of the independence of the Republic of Uzbekistan.

The land area allocated for the device is 1 ha. The height of the mast of the device is 65 meters, the weight of the mast is 101 tons.

More than 1.7 million kilowatt-hours of electricity have been produced since the device was put into operation until today.

In addition, research centers established by the government have also done great work in this regard. In particular, the "Eco-energy" scientific and practical center, which has been operating under the State Committee for Nature Protection of the Republic of Uzbekistan since 2005, has actively participated in the construction of SPPs in cooperation with relevant enterprises and organizations.

In order to develop wind energy in the republic, the Intec Gopa (Germany) company, in cooperation with GEO-NET, carried out project-research works on the study of the country's wind potential. A presentation was made on the results of the study, and the report "Assessment of the development of wind energy opportunities of the Republic of Uzbekistan - mesoscale modeling and site assessment" was presented. As a result, in the Republic of Karakalpakstan and Navoi region, areas with great potential were selected for further expansion of wind energy.

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A national conference dedicated to the wind-energy potential of Uzbekistan was held in Tashkent regarding the development of the industry. Atlas of wind energy available in Uzbekistan was presented at the first national conference. This map was developed using special modeling computer programs.

Preliminary analyzes show that the country's wind energy potential is 520,000 MW of installed capacity and more than one billion MWh of energy that can be produced. At the conference, it was recognized that there are long-term quality wind conditions (60 thousand MW in Nukus and 75 thousand MW in Zarafshon) in Navoi region and the Republic of Karakalpakstan, which were assessed by JSC "Uzbekenergo" as two promising regions based on the wind atlas, and they are conveniently located. As a result of the measurements carried out in each region, the annual production volume in the Nukus region was 326 million kWh, and in the Zarafshan region - 358 million kWh. In both areas, there is great scope for project expansion based on additional survey results.

For this reason, the attention of the participants of the conference focused on a number of current issues, as well as on the issues of accurate measurement of wind parameters near the south of the Republic of Karakalpakstan and the Navoi region, the city of Zarafshan within 12 months. In particular, Yohannes Becker, project manager of "GEO-NET" company, gave information about the wind potential in his presentation and presented a wind map of the country.

Activities in this regard were effectively continued in different regions of the republic. For example, in 2015, a device for supplying the facility with electricity and drawing water from a well was installed and put into operation in the desert area of Qiziltepa district of Navoi region.

By 2016, it is planned to start construction of a park of wind energy devices with a capacity of 100 MW in the country. According to the calculations of the Institute of Energy and Automation of the Academy of Sciences of Uzbekistan, the launch of the project will help save 68 million cubic meters of natural gas. Also, according to the director of the Institute of Energy and Automation, the German company "GEO-NET Umweltconsulting GmbH" assessed the country's wind energy potential in six regions of Uzbekistan by the end of 2015. In this regard, the state joint-stock company "Uzbekenergo" also carried out large-scale activities.

In particular, this company plans to launch six wind power plants by 2020 in cooperation with foreign German partners.

CONCLUSION

In conclusion, 75% of the territory of Uzbekistan is unsuitable for use for generating energy using wind power. This includes flat lands, where wind currents depend on the season. Despite these

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problems, a number of activities related to the use of wind energy were carried out in the republic, international relations were established, and scientific conferences were organized. In the use of wind energy, areas with strong winds were selected. A wind atlas was created in cooperation with Germany, and it was determined that the Republic of Karakalpakstan, Navoi region and Tashkent region have good conditions for the construction of wind power plants.

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