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ASSESSMENT OF GREEN ENERGY POTENTIAL OF ZANGILAN DISTRICT**POLADOVA V.N.****VELIZADE I.E.**

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ABSTRACT

In the article Zangilan region has been considered suitable for the implementation of solar energy projects taking into account green energy resources, climatic and transport problems and other technical factors.

Keywords: Green energy, solar energy, bioenergy, biomass.

ОЦЕНКА ЗЕЛЕННОГО ЭНЕРГЕТИЧЕСКОГО ПОТЕНЦИАЛА**ЗАНГИЛАНСКОГО РАЙОНА****ПОЛАДОВА В.Н., ВЕЛИЗАДЕ И.Е.**

Резюме: В статье рассмотрен Зангиланский район, подходящий для реализации проектов зеленых энергоресурсов, солнечной энергии, с учетом климатических, транспортных проблем и других технических факторов региона.

Ключевые слова: Зеленая энергетика, солнечная энергия, биоэнергетика, биомасса.

ZƏNGİLƏN RAYONUNUN YAŞIL ENERJİ POTENSİALININ**QIYMƏTLƏNDİRİLMƏSİ****POLADOVA V.N., VƏLİZADƏ İ.E.**

Xülasə: Məqalədə yaşıl enerji ehtiyatları, günəş enerji layihələrinin həyata keçirilməsi üçün rayonun klimatik, nəqliyyat problemləri və digər texniki faktorları nəzərə alınmaqla Zəngilan rayonu məqsədə uyğun hesab edilmişdir.

Açar sözlər: Yaşıl enerji, günəş enerjisi, bioenerji, biokütlə.

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1.INTRODUCTION

It is known that the possibilities of using renewable energy sources (with RES) in the liberated territories are quite wide, and the favorable geographical location of these territories allows for sufficient use of this potential. According to preliminary assessments, there is more than 7,200 MW of solar and up to 2,000 MW of wind energy potential in the liberated territories. Fuzuli, Jabrayil, Zangilan regions are rich in solar energy potential, and Lachin and Kalbajar regions, which are mainly mountainous regions, are rich in wind energy. As you know, the relevant Implementation Agreement on the 240 MW solar energy project has already been signed in Jabrayil region. In the territory of Lachin and Kalbajar regions, it is

planned to implement the construction project of Wind Power Plant with a capacity of up to 400 MW. [1]

It should be noted that it is planned to create a "Green Energy" zone in the territories freed from occupation. In this regard, within the framework of the implementation of the agreement signed between the Ministry of Energy and the Japanese company **TEPCO** on May 6, 2021, the "Green Energy Zone" Concept project was developed.

Along with other infrastructure projects, the Zangezur corridor will have an important role in the export of energy types. It is planned to export energy to Turkey and Europe through this corridor in the future. So that, the establishment of the "Jabrayil" energy junction, the export of electric energy to Turkey and the European market by laying the electric transmission lines through the Zangezur corridor to Nakhchivan Autonomous Republic will further increase the economic and geopolitical role of Azerbaijan and contribute to the economic development of our country.

According to the comparative analysis of topography, climatic conditions, proximity to the grid, energy production potential, transport infrastructure and other technical factors, the territory of Zangilan region was considered suitable for the purpose of the preliminary studies conducted for "solar energy" projects.

According to the amount of solar radiation falling on the Earth's surface, Zangilan, Jabrayil, Gubadli and Fuzuli districts are second after Nakhchivan Autonomous Republic. Here, solar radiation falling on one square meter of horizontal surface is 1600-1700 kilowatt-hours per year. The total solar energy potential of these areas is 3000-4000 megawatts. A more accurate calculation of the potential will be carried out by installing measuring observation stations in the area. [2,3]

In June of current year, an Executive Agreement was signed with the Great Britain BP company on the evaluation and implementation of the 240 megawatt solar power plant construction project in the Zangilan-Jabrayil area. The European company will invest more than 200 million in solar power projects in Karabakh. This is considered an important step towards attracting foreign investment to Karabakh and will continue to attract foreign investors to invest in renewable energy projects in Karabakh.

The creation of a "green" energy zone in Karabakh is the focus of attention of the countries of the world. The construction of freed territories based on the concept of "smart village" attracts the interest of foreign visitors and investors. It is no coincidence that the visit of the US delegation led by Oklahoma state governor John Kevin Stitt to the Zangilan district and the high appreciation of the use of alternative energy in the project give reason to say this.

Birinci Agali village of Zangilan district is the first "smart village" project to be established in Karabakh and in Azerbaijan in general. Here, all residences, social facilities, administrative and public catering buildings, processing and production of agricultural products will be provided with renewable energy sources. The participation of specialists from Turkish, Chinese, Italian and Israel companies in the implementation of the project is an important factor in the study of world experience in this direction and Azerbaijan's position among the countries of the world.

Aghdam region is also planned to be built according to the "smart city" concept. The buildings here are also planned to be built in accordance with the typology of "smart buildings" in accordance with special international standards.

Azerbaijan is a strategic partner of the European Union in terms of energy security. Considering the provisions of the "Memorandum of Understanding on Strategic Partnership in the field of energy between the European Union and the Republic of Azerbaijan" signed on July 18, 2022, the importance of the Agreement should be specially emphasized. The signing of the agreement in Bucharest is one of the important steps towards the creation of the green energy corridor.

Our country is becoming a green energy supplier of European electricity, which indicates that Azerbaijan has entered a new stage in energy exports to the European market. The intergovernmental agreement envisages the implementation of the project of laying an underwater cable that will pass through Georgia and the Black Sea for the transmission of "green energy" between Azerbaijan and Romania. The electricity transmitted by this cable is then planned to be transported to Hungary and the rest of the continent through the European transmission system.



Picture 1. Description of the perspective of Zangilan's transformation into a "green energy" zone

2. Zangilan's special role, opportunities and expected results in the process of turning Karabakh into the "green energy" zone.

Solar energy has great potential in Zangilan. Preliminary studies have already been conducted and as a result of the reconstruction of energy generation capacities and transmission lines in the freed lands, plant growing, fruit growing, and animal husbandry will develop faster.

According to the official normative information on crop production, in 1980, autumn and spring wheat were planted on 1526 hectares of grain production and 1857 tons of crops were obtained. In 1985, the area was 1488 hectares, and the harvest was 3111 tons. In 1988, 3793 tons of wheat were produced from 1583 hectares of land. In 1980, 329 tons of fall and spring barley were harvested from an area of 214 hectares, in 1985, 600 tons were harvested from an area of 225 hectares, and in 1988, 829 tons were harvested from an area of 346 hectares. In 1980, cereals and grain legumes were planted on 1813 hectares and 2186 tons of crops were

collected. In 1985, 3,722 tons were produced from 1,747 hectares of land, and in 1988, 4,622 tons were produced from 1,929 hectares of land. In 1980, 1,232 tons of tobacco were collected from 381 hectares of land, in 1985, 1,313 tons were collected from 369 hectares of land, and in 1988, 1,272 tons were collected from 359 hectares of land. Grapes are the most preferred production in the region. In 1980, 15,429 tons were produced from 4,573 hectares of land, in 1985, 26,165 tons were produced from 3,841 hectares of land, and in 1988, 16,322 tons were produced from 2,391 hectares of land.

According to the normative data of 1988, the total cultivated area of Zangilan region was 6726 hectares and 26375 tons of different products were produced. With the listed labor, land, climate and water resources, it is possible to produce many times more than this production. If we take into account that in modern times, serious development has been achieved with the modern approach applied in all fields of agriculture, it is possible to achieve a significant increase in the production volume that was before the occupation by introducing new types of breeds in animal husbandry, and more productive seeds in crop cultivation. All these will play an important role in the agriculture of our country after the liberation of Karabakh, including Zangilan. [4-7]

The following table shows the production in 2019 in various fields of agriculture across the country and the potential production opportunities of Zangilan region for those products and the share in increasing that production across the country. Table 1 reflects the benefits that will be given to our country in this field after the restoration of agricultural activities in Zangilan district.

Table 1. Indicators for the country after the restoration of agricultural activity in Zangilan district

Name	Total by country (2019)	Zangilan district (1985)	After the restoration of agricultural activity in Zangilan district, the increase in indicators for the country, in percentage
Sown area (ha)	1717054	6726	0.39
Wheat (ton)	2171490	3111	0.14
Barley (ton)	1015539	600	0.06
Cereals and grain legumes (ton)	3538489	3722	0.11
Tobacco (ton)	6038.6	1313	21.7
Grapes (ton)	201842.4	26165	13.0

The total cultivated area of the region is equal to only 0.4 percent of cultivated land in the country. It is clear from the table above that Zangilan's workforce and climate resources are used very productively. In the region, which mainly specializes in tobacco and grape production, an increase of about 22 percent and about 13 percent in grapes will be observed in the first years after the resumption of tobacco production. From other plants, barley, wheat and cereals and an increase of approximately 0.1 percent can be observed from the planting of grain legumes. With the restoration of cattle breeding, an increase of 0.8 percent in this area and 0.4 percent in small cattle breeding can be expected. According to these areas, live and slaughtered meat production will increase by 0.3 percent and wool production by about 3

percent. Milk and egg production are predicted to increase by 0.4 and 0.2 percent, respectively.

A long time has passed since 1985. During the period of 33 years, The Republic of Azerbaijan has achieved significant development in all fields of agriculture. Undoubtedly, Zangilan region would not have been left out of this development if it had not been occupied by Armenians. At the same time, in modern times, the level of development of science, innovative production technologies, innovative methods of cultivation and other factors indicate that the potential opportunities of the region are greater.

3. RESULT

The solar, wind, hydro and bioenergy resources of the region are significantly high. The total solar energy potential of these areas is 4000 MW, wind and hydro energy cover mountainous areas. We come to the conclusion that Zangilan region will play a special role in transforming Karabakh into a "green energy" zone.

According to official bioenergy statistics, cereal and leguminous plants, tobacco growing, grape growing, fruit growing will develop with increasing dynamics. The conducted preliminary studies, the analysis of climatic conditions, energy potential, transport infrastructure and other technical factors to implement various "solar energy" projects, the area of Zangilan region was selected appropriately.

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