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ПРОБЛЕМИ ВІТРОЕНЕРГЕТИЧНОЇ ГАЛУЗІ
ПРИ РОЗРОБЦІ ТА УПРАВЛІННІ ПРОЕКТАМИ

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PROBLEMS OF THE WIND ENERGY INDUSTRY IN DEVELOPMENT AND PROJECT
MANAGEMENT

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ПРОБЛЕМЫ ОБЛАСТИ ВЕТРОЕНЕРГЕТИКИ
ПРИ РАЗРАБОТКЕ И УПРАВЛЕНИИ ПРОЕКТАМИ

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Introduction. Today, alternative energy with the use of non-traditional and renewable energy sources is one of the basic directions of technology development in the world. Together with information resources and nanotechnology, it is an important component of the new post-industrial technological system. The availability of an inexhaustible resource base and the ecological purity of non-traditional and renewable energy sources are determinative benefits in terms of exhaustion of organic fuel resources and increasing of environmental pollution. In addition, renewable energy sources do not need to be extracted, bought and transported.

Wind power is a pure and independent source of electricity. For Ukraine, wind energy is an extremely important industry, the development of which will reduce the country's dependence on imported fossil fuels and emissions of greenhouse gases and other environmental pollution.

The European Commission referred wind power to one of the priority areas for the development of electricity generation [4]. According to the forecast of the International Energy Agency, by 2040 wind power stations will become the cheapest way of electricity generating in the world. The cost of wind projects will decrease by 32%, and this will be possible due to the accumulated experience and improved financing. The share of wind in global electricity generation will increase to 40% [1].

Main part. For the effective development of the wind power industry in Ukraine, certain preconditions have emerged, among which economic and environmental ones are divided. The following factors can be attributed to the economic preconditions for the development of wind energy: the growth of world prices for fuel resources and the dependence of most European countries, including Ukraine, on the import of fuel from abroad. In addition, the fact of limited fuel resources also plays an important role in this process. Among the environmental conditions are the following: significant deterioration of the atmosphere and the ozone layer of the earth through the burning of a huge amount of fuel and other types of pollution, the problem of utilization of nuclear waste and the realization the real danger coming from nuclear power stations, etc. [6].

The wind energy has been used by people for several centuries for sailing sea-going vessels. From the beginning of the 19th century, the kinetic energy of the wind is used to rotate the windmill, to lift the water. With the discovery of electricity and the development of technology has found its practical application and method of producing electricity with a help of wind power [3].

In 1997, a state program for the construction of wind power plants was adopted in Ukraine, which initiated the investment of funds for the production of clean electricity. Even after it stopped in 2010, private investors continued to invest in wind energy thanks to the adoption of the Green Tariff Law in April 2009. One of the obligatory points was the requirement of "local component", that is, the amount of used equipment of Ukrainian production should be not less than 30% [7, 8].

On October 1, 2014, the Cabinet of Ministers of Ukraine approved the National Action Plan for the Development of Renewable Energy by 2020. The relevant document provides that in five years renewable energy sources in Ukraine should produce at least 11% of electricity in Ukraine. This plan introduced the abolition of the "local component" rule - mandatory use of Ukrainian equipment for wind power stations. Instead, it is suggested to introduce a stimulating factor, that is, an additional charge to the "green tariff" when using domestic equipment [9, 10].

According to the Inter-branch scientific and technical center of wind energy of the National Academy of Sciences of Ukraine, the territory of our country which can be used for wind energy stations was estimated at 30 TWh / year [11].

On the territory of Ukraine, areas suitable for the construction of wind power plants (WPP) are considered to be areas up to 7 thousand km², namely, Carpathian, Azov, Donetsk, West-Crimean, , Kerch regions, Kharkiv, Poltava and Odessa regions.

It should be noted that unlike the former CIS countries, Ukraine alone has a well-established mass production of licensed wind power stations.

The analysis of the advantages of wind energy made it possible to distinguish the following directions:

- wind energy is cost effective;
- wind energy creates additional jobs;
- wind energy contributes to the development of the relevant industry area and the overall competitiveness of Ukraine;
- it is a source of environmentally friendly fuel. Wind energy does not pollute the air; wind turbines do not produce atmospheric emissions that cause acid rain, smog or greenhouse effect;
- wind is an inexhaustible source of energy;
- wind turbines can be used by small businesses and households.

"Green Tariff", that is, the tariff on which the wholesale electricity market of Ukraine is obliged to purchase electric energy, produced on the objects of electric power from alternative sources of energy, can now be used for small wind power business. A household that has installed a wind turbine with a capacity of up to 30 kW to satisfy its own needs receives the right to use the "green tariff" and can sell surpluses to the general network. It opens completely new opportunities for domestic households as well as entrepreneurs. In Ukraine today, the use of small-capacity windmills, which are set by small enterprises and households for their own needs is increasing. Small wind power stations (200 W to 20 kW) are attractive because they can be installed quickly enough and are best suited to where there are no other sources of energy, or when connecting to existing networks is too expensive. Importantly, wind stations with a capacity of up to 20 kW do not require any permits and licenses for their use [9,10].

But along with the unconditional advantages of the wind energy industry, attention should be paid to certain disadvantages, among which:

- wind energy requires significant financial investments;
- geographical dependence, that is, the territory of land with significant wind, which is needed for the effective operation of the wind power stations, is often located in remote places, which leads to additional costs;
- turbines of wind power stations can cause additional noise and aesthetic pollution.
- there is a problem of the death of birds.

The Commission of the European Communities entrusted to a group of Dutch consultants to investigate the impact of wind turbines on the lives of birds. The main findings of the study are as follows: the death of birds in the event of a collision with wind power stations is not a significant problem. This problem is less significant than the death of birds due to the transport, transmission lines, and so on. Violations of the migration routes also do not represent a significant threat. Avoiding wind turbines, birds only slightly change their route, which does not significantly affect their lifecycle [12].

Analyzing the noise problem caused by wind power stations, it can be noted that most of the modern wind power plants in the immediate proximity of their construction places at a wind speed of 8 m / s generate

a noise of approximately 95-102 dB, what is corresponding to the noise level of a conventional industrial plant [5]. In order to avoid the harmful effects of noise on the human body, the distance from the wind turbine to the home must be not less than 150 m, and from the wind power station - not less than 250 m.

Having analyzed the advantages and disadvantages of using of the wind energy, we will define the problems of wind energy industry.

Among the main problems should be noted the lack of financing. In the main, the wind energy industry is developing at the expense of private investment. The financial crisis and political instability negatively affected the development of the industry, which slowed down its development in 2014-2016.

The next problem is the instability and frequent change in legislative regulation in the energy sector of Ukraine.

It is also necessary to highlight a problem such as a significant number of barriers when entering the alternative energy market, and a high cost of wind energy equipment. The average cost of equipment is about 1000USD per 1 kW of installed capacity.

The problem with the stable functioning of wind power stations is that it is difficult to predict the strength and direction of the wind for a long period of time.

Among other problems we can distinguish: repair of wind power stations in areas of antiterrorist operations, problems with calculations of the state for supplied electricity in the territory bordering uncontrolled territories. This keeps the development of wind power in certain regions of Ukraine.

At the present time, the bill "On the Electricity Market of Ukraine", prepared by the Ministry of Energy and Coal Industry of Ukraine, was adopted in the alternative energy market. Among other things, it is proposed to introduce penalties for wind power stations for deviations from the actual volumes of electricity supply to the network from the daily charts of electricity supply for the next day in the amount of more than 10%. Since there is no specialized meteorological infrastructure in Ukraine that can accurately predict the weather, such changes for the unprepared market can be catastrophic and destroy the industry as a whole.

Speaking about the wind energy industry in Ukraine, it is advisable to analyze how rapidly this market develops. An analysis of the growth rate of electric energy generated by wind is presented in Fig. 1 [13].

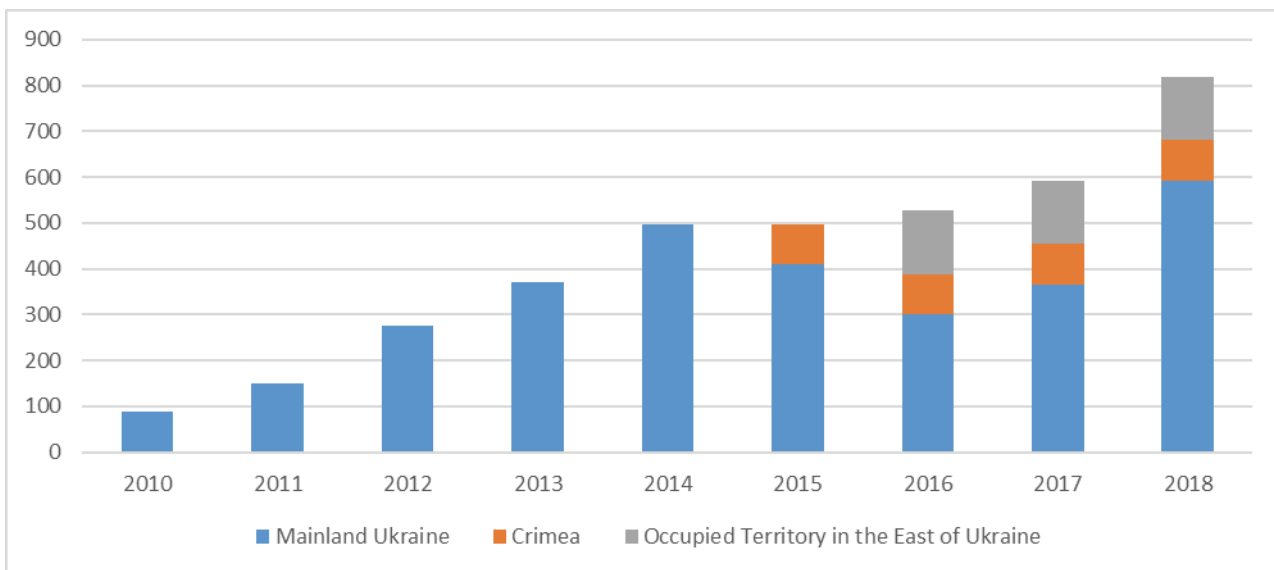


Figure 1 – Analysis of the growth rate of the wind energy sector, MW

When projecting and implementing wind energy projects (WEP) in alternative energy companies, it is necessary to take into account the advantages and disadvantages of this industry.

Under wind energy projects, we understand projects aimed at creating such a product as electricity by using wind power. It should be noted that wind power projects are characterized by a high investment attractiveness, thanks to a relatively short payback period of about 6-8 years.

Successful implementation of wind energy projects is impossible without proper management. Wind energy projects management is understood as activities aimed at implementing a project, which is aimed to obtain such a product as energy, due to wind power, with the maximum possible efficiency with given limitations on time, cost and quality of final results.

Let's consider what problems the project manager faces with when managing projects at wind energy enterprises.

Bureaucracy: A significant part of the time of project implementation is spending for the approval of the necessary documents in government structures. It is necessary to have this in mind when planning the time allocated for the implementation of the project.

Budget limit, which is a normal factor in a market economy, where there is always an additional cost. Consequently, we can conclude that when planning a project budget it is necessary to reserve a certain part of money for force majeure circumstances.

Determination and removal of the required land under the wind power station. We keep in mind that in addition to the fact that it is necessary to find the area of land on which the wind is most advantageous for the operation of the wind power station, it must be located at the required distance from the settlement to meet all the necessary environmental standards.

Dependence on equipment suppliers or other component parts. Dependence on weather conditions. When installing a wind power plant it is necessary to plan the stages of project implementation, taking into account weather conditions.

Dependence on the human factor. Since the main part of the success of a project implementing depends on how the manager was able to motivate and encourage the project team to work.

Conclusion. So, for a successful project implementation in the wind energy area, it is necessary to consider not only problems of the project itself and the operating internal factors, but also problems of the development of the whole industry and external factors. Along with the existing problems, it should be noted that underestimating the development of alternative energy sources, namely the development of wind energy, in Ukraine is impossible. It is this direction of the development of the Ukrainian economy, besides environmental safety, the provision of jobs, raising the financial level, energy independence for our country.

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РЕФЕРАТ

Бакуліч О.О. Проблеми вітроенергетичної галузі при розробці та управлінні проектами / О.О. Бакуліч, А.В. Севост'янова // Вісник Національного транспортного університету. Серія “Технічні науки”. Науково-технічний збірник. – К. : НТУ – 2018. – Вип. 3 (42).

Стаття присвячена висвітленню проблемних питань в галузі вітроенергетики та спірних питань, що виникають при реалізації вітроенергетичних проектів. Енергія вітру - це чисте та незалежне джерело електроенергії. Для України вітроенергетика є надзвичайно важливою галуззю, розвиток якої дозволить зменшити залежність країни від імпортованого викопного палива та викидів парникових газів та інших забруднень навколишнього середовища.

Об’єкт дослідження – вітроенергетична галузь.

Мета роботи – дослідити основні проблеми, які існують при реалізації проектів у секторі вітроенергетики.

Метод дослідження – аналіз та синтез .

Для ефективного розвитку вітроенергетичної галузі в Україні вже склалися певні передумови, серед яких розділяють економічні та екологічні. До економічних передумов розвитку вітроенергетики можна віднести наступні фактори: зростання світових цін на паливні ресурси і залежність більшості європейських країн, в тому числі і України, від ввезення палива з-за кордону. Серед екологічних

передумов можна виділити наступні: істотне погіршення стану атмосфери і озонового шару землі через спалювання значної кількості палива та інші види забруднення, проблема утилізації ядерних відходів і усвідомлення реально існуючої небезпеки, що надходить від атомних станцій, тощо. Однак, при реалізації проектів у секторі вітроенергетики України необхідно брати до уваги і можливі проблеми та загрози, що існують в цьому секторі. Дане питання висвітлено в цій статті.

Отримані результати можуть бути використані при розробці та реалізації проектів у секторі вітроенергетики України.

КЛЮЧОВІ СЛОВА: ВІТРОЕНЕРГЕТИКА, ЕКОЛОГІЯ, ПАЛИВО, ЕНЕРГІЯ, ЕФЕКТИВНІСТЬ.

ABSTRACT

Bakulich O.O., Sevostianova A.V. Problems of the wind energy industry in development and project management. Visnyk of National Transport University. Series "Technical sciences". Scientific and Technical Collection. Kyiv. National Transport University. 2018. Vol. 3(42).

An article devoted to the coverage of problematic issues in the field of wind energy and controversial issues that arise in the implementation of wind energy projects. Wind power is a pure and independent source of electricity. For Ukraine, wind energy is an extremely important industry, the development of which will reduce the dependence of the country on imported fossil fuels and emissions of greenhouse gases and other environmental pollution.

Object of the study: wind energy industry.

Purpose of the study: to investigate the main problems that exist when implementing projects in the wind energy sector.

Method of the study: analysis and synthesis

For the effective development of the wind power industry in Ukraine, certain preconditions have emerged, among which economic and environmental ones are divided. The following factors can be attributed to the economic preconditions for the development of wind energy: the growth of world prices for fuel resources and the dependence of most European countries, including Ukraine, on the importation fuel. Among the environmental conditions, one can distinguish the following: significant deterioration of the atmosphere and the ozone layer of land due to the burning of a huge amount of fuel and other types of pollution, the problem of utilization of nuclear wastes and the realization of the real danger coming from nuclear power stations, etc. However, when implementing projects in the Ukrainian wind energy sector, it is necessary to take into account possible problems and threats existing in this sector. This issue is covered in this article.

The obtained results can be used in the development and implementation projects in the Ukrainian wind power sector.

KEY WORDS: WIND ENERGY, ECOLOGY, FUEL, ENERGY, EFFICIENCY.

РЕФЕРАТ

Бакулич Е.А. Проблемы ветроэнергетической отрасли при разработке и управлении проектами / Е.А. Бакулич, А.В. Севостьянова // Вестник Национального транспортного университета. Серия "Технические науки". Научно-технический сборник. – К. : НТУ – 2018. – Вып. 3(42).

Статья посвящена освещению проблемных и спорных вопросов в области ветроэнергетики, возникающих при реализации ветроэнергетических проектов. Энергия ветра – это чистый и независимый источник электроэнергии. Для Украины ветроэнергетика является чрезвычайно важной отраслью, развитие которой позволит уменьшить зависимость страны от импортируемого ископаемого топлива и выбросов парниковых газов и других загрязнений окружающей среды.

Объект исследования - ветроэнергетическая отрасль.

Цель работы – исследовать основные проблемы, которые существуют при реализации проектов в секторе ветроэнергетики.

Метод исследования - анализ и синтез.

Для эффективного развития ветроэнергетической отрасли в Украине уже сложились определенные предпосылки, среди которых разделяют экономические и экологические. К экономическим предпосылкам развития ветроэнергетики можно отнести следующие факторы: рост мировых цен на топливо, зависимость большинства европейских стран, в том числе и Украины, от

ввоза топлива из-за рубежа. Среди экологических предпосылок можно выделить следующие: существенное ухудшение состояния атмосферы и озонового слоя земли из-за сжигания огромного количества топлива и другие виды загрязнений, проблема утилизации ядерных отходов и осознание реально существующей опасности, поступающей от атомных станций. Однако, при реализации проектов в секторе ветроэнергетики Украины необходимо принимать во внимание возможные проблемы и угрозы, существующие в этом секторе. Данный вопрос освещен в этой статье.

Полученные результаты могут быть использованы при разработке и реализации проектов в секторе ветроэнергетики Украины.

КЛЮЧЕВЫЕ СЛОВА: ВЕТРОЭНЕРГЕТИКА, ЭКОЛОГИЯ, ТОПЛИВО, ЭНЕРГИЯ, ЭФФЕКТИВНОСТЬ.

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