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PROSPECTS FOR THE DEVELOPMENT OF RENEWABLE ENERGY

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Abstract. *The study focuses on the prospects for the development of renewable energy. The economic, political, environmental, medical processes of society have led to a rapid increase in the capacity of renewable sources. The aim of the work is to focus the attention of scientists, the authorities, the world community on the need to provide an opportunity for the development and prospective expansion of the renewable energy sub-sector. It has been made that the development of the renewable energy sub-sector is possible in several ways: thorough financing by the state, private capital investment, foreign investment. But the appropriate combination of these tools. Factors such as martial law, the presence of COVID-2019 should not hinder the dynamic processes in renewable energy.*

Key words: *renewable energy, renewable energy sources, exhaustibility of energy sources, energy resources.*

Introductions.

Exhaustive energy resources, environmental problems associated with their use, energy dependence, the need for decentralization of energy supply caused the development of renewable energy. Opinions about the use of renewable energy developed dynamically in the 1970s after the oil crisis of 1973. It showed the dependence of the world economy on oil imports. Later, the Chernobyl disaster intensified the development of renewable energy. The sub-industry received a stormy boost after the adoption of international agreements to prevent global climate change. European countries have ratified the Kyoto Protocol of the UN Framework Convention on Climate Change. In accordance with the protocol, restrictions on emissions of «greenhouse gases» were introduced. In 2017, Ukraine ratified the «Energy Strategy of Ukraine for the period until 2035». All this led to an increase in the installed capacity of renewable sources.

Aim.

Focus the attention of scientists, authorities, and the world community on the need to provide opportunities for the development and prospective expansion of the sub-sector of renewable energy.

Materials and methods.

The research methodology is based on a combination of general and special methods. Of the general methods of research, fundamental and applied, analysis, synthesis, induction, deduction, abstract-logical generalization, theoretical, and

empirical methods are used. Among the special research methods, economic-statistical, comparative and economic analysis were used. Statistical data were taken as the information basis the International Energy Agency (IEA), the Ocean Energy Systems Association, the International Renewable Energy Agency (IRENA), the Wind Europe Association, the European Commission, the REN21 Association, Bloomberg New Energy Finance and other organizations, the World Bank.

Results and discussion.

Researchers of the Institute of Renewable Energy (Kyiv, Ukraine), the Interdisciplinary Scientific and Technical Center of Wind Energy (Kyiv, Ukraine), the Rozumkov Center, scientists Z. Atamanchuk, E. Bazeev, B. Basok, A. Cherep, V. Geets, V. Dresvyannikov, O. Kirylenko, S. Kudrya, N. Mkhitarian, V. Reztsov, A. Zavydovska, P. Vasko, others.

In 2020, V. Geets and a team of authors noted that «Ukraine's energy policy will depend on the energy contours of the new world – energy trends and scenarios, global and local risks». But the following factors were added to the existing factors at that time.

The world economy was significantly affected by COVID-2019. In 2020, its volumes decreased by 4.3% compared to 2019 due to the virus. On the contrary, the world energy market developed harmoniously during this difficult period. In particular, according to BloombergNEF, global wind energy capacity increased by 59% compared to 2019.

According to the Rozumkov Center, the volume of investments in the expansion of renewable energy sources in Ukraine in 2020 decreased by 68%. This situation is caused by a rapid increase in the state's receivables to producers of «green» energy.

Intensive construction of solar power plants and wind power plants was observed in Ukraine. The conditions of the country's military state have somewhat changed the development of the energy industry.

Z. Atamanchuk, A. Zavydovska note: «the Ukrainian sector of renewable energy has a significant potential for attracting investments. After synchronizing with ENTSO-E – the European network of electricity transmission system operators (uniting 43 operators in 39 countries of the European continent), Ukraine will have much more opportunities and prospects for attracting investments in its own energy sector».

The development of the sub-sector of renewable energy is possible in several ways: thorough funding by the state, investment of private Ukrainian capital, foreign investment. But a combination of these means is appropriate.

Factors such as martial law and the presence of COVID-19 should not hold back dynamic processes in renewable energy.

Moreover, it has a significant number of positive features:

- renewability;
- environmental cleanliness;
- possibility of use in hard-to-reach places;
- ergonomics;
- «green tariff» significantly attracts investors;
- renewable energy sources have a kind of positive impact on the environment

(for example, significant weakening of hurricanes). Along with that, there are a number of negative features:

- instability of work in the absence of wind;
- relatively low output of electrical energy;
- the need to create a power reserve in the energy system;
- the need to develop and apply a mechanism for smoothing the heterogeneity of electricity production;
- high cost of ultimately obtained electrical energy;
- wind turbines are ineffective during peak loads;
- renewable energy sources have a partial negative impact on the environment (for example, a change in the moisture regime of the territory, a change in the climate towards continentality, wind turbine elements pose a potential danger to certain living organisms - birds, bats).
- noise level of wind turbines.

The last series requires in-depth development of effective mechanisms for elimination and reduction of negative traits.

But the global development of society and the depletion of old energy sources require faster and large-scale use of renewable energy sources. By 2030, it is expedient to increase the capacities of the sub-sector of alternative energy and reduce disproportions in the structure of the energy industry.

Therefore, it is important to focus the attention of scientists, the authorities, and the world community on the need to provide opportunities for the development and prospective expansion of the sub-sector of renewable energy.

Conclusions.

It is important to focus the attention of scientists, the authorities, and the world community on the need to provide opportunities for the development and prospective expansion of the sub-sector of renewable energy.

The development of the sub-sector of renewable energy is possible in several ways: thorough funding by the state, investment of private Ukrainian capital, foreign investment. But a combination of these means is appropriate. Factors such as martial law and the presence of COVID-19 should not hold back dynamic processes in renewable energy.

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