

TECHNICAL SCIENCES

THE DEVELOPMENT RENEWABLE ENERGY SOURCES PROBLEMS DURING THE WAR

Malogulko Yu.,
associate professor, PhD

Kovalchuk N.,
student

Lastivka V.
student

Vinnitsa national technical university
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Abstract

Analyzed the main factors of influence on the development of renewable energy in Ukraine at various stages and provided recommendations on forms of RES support and maintaining investor's interest in this field during the post-war recovery period.

Keywords: renewable energy sources, war, Schedules of emergency shutdowns, power network.

In the conditions of emergency power outages and regular missile attacks on Ukraine, the search for alternative sources of energy has become extremely important. Increasingly, the most optimal option in conditions of permanent power outages is the implementation of decentralized energy supply solutions.

As practice shows, they can be implemented using renewable energy sources (RES). The industry has developed quite rapidly, but also in the last almost 3 years, a lot of problems have arisen that are currently not being solved. As a result, the prospects for the development of the RES sector are decreasing, investors are afraid to invest, and the unsettled legal field prevents the surviving RES electricity producers from working, and the owners of the destroyed stations from receiving funds for reconstruction.

Thousands of consumers throughout the country remain without electricity every day. Schedules of emergency shutdowns are introduced in an emergency order to stabilize the work of the energy system and ensure the balance of energy generation and consumption. Second, if before the war the switchover from fossil fuels to carbon-neutral energy was considered exclusively in the context of overcoming the climate crisis, now the entire democratic world has united against Russian energy resources. Russian gas and oil should

gradually be replaced by new technologies and even more renewable energy sources.

That is, there are more than enough prerequisites for the further development of renewable energy in Ukraine. In addition, its development is legislated in strategic documents. Renewable energy also finds its place in plans for post-war reconstruction and development of Ukraine.

Also, in the plans for the "green" reconstruction of the country, it is necessary to pay attention also to the problem of local accumulation of energy resources. Ukrainian government should think about the diversification of this energy resources.

It is very important to develop the area of RES, in particular, decentralized energy as a way to democratize the energy sector in Ukraine. Today, due to excessive centralization of the energy system, the sector has a number of disadvantages. Some of them relate to safety indicators, which were appeared in excessive dependence on the import of resources to ensure the power system. Including their excessive concentration in specific places.

According to the official data of NEURC (National Energy and Utilities Regulatory Commission), it is possible to observe the dynamics of the development of RES in the last four years.

The dynamics of the development of the RES 2018-2022

Source: BULLETIN TO THE 2021 NEURC ANNUAL REPORT, June 2022

At the beginning of 2022: total power of RES stations - 11435 MW; annual release of electricity from RES - 11436 million kW*h.

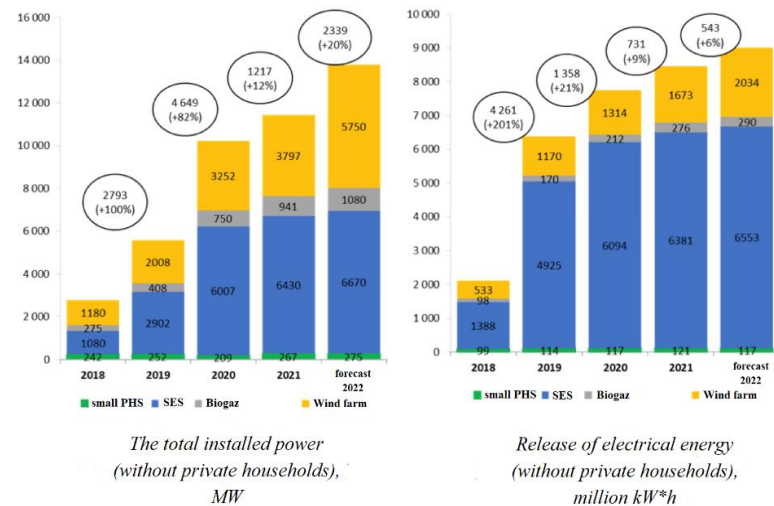


Figure 1

Despite the growth, the industry has accumulated three characteristic problems: technical, economic and legal

As for technical barriers, we are talking about the difficulty in issuing technical conditions and connecting new RES generation facilities to the energy system of Ukraine. It is difficult at the moment, because the system has suffered a lot of damage.

The establishment of the "feed-in tariff", the calculation of which is unchanged for producers until 2030, was the first step in the legalization of green energy and a mechanism for supporting RES facilities.

However, closer to 2020, problems started to affect the RES industry. In order to improve the rules of the game in the market, was adopted the Law "On amendments to some laws of Ukraine regarding the improvement of the conditions for supporting the production of electricity from alternative energy sources" No. 810-IX dated 21 July 2020 and the Regulation of the Cabinet of Ministers of Ukraine dated 2 August 2022 № 889.

Legislative acts guaranteed the charter of RES producers to participate in auctions for the allocation of support quotas:

- Required participation for WPPs (Wind Power Plants) over 5 MW and SPPs (Solar Power Plant) over 1 MW, on a voluntary basis - for other RES.
- Guaranteed purchase of electricity for 20 years from the commissioning of the station within the quota at the price determined at the auction.
- Auctions for the distribution of annual quotas are expected to be held in accordance with the schedule of auctions for the relevant year in the period from July 1, 2019 to December 31, 2029. Support quotas must be approved by the CMU (Cabinet of Ministers of Ukraine) for the next year with indicative prognosis for 4 years.
- The size of the quota for each type of RES is not less than 10%.

However, as of November 2022, no annual quota allocation auction has been held. Such cases limit the ability of manufacturers to predict the financial and economic performance of their enterprises. Unreliability on the part of the authorities expands to the legal

segment, which control the sector of "green" energy. As follows, over the past 4 years, the situation in the sector of RES has worsened also because the authorities executed their obligations with violations to the producers of "green" energy.

Restructuring of "green tariffs" was carried out, namely:

1) Introduction of the restructuring mechanism "green" tariff.

On July 21 2020, Law 810-IX was adopted:

- retrospective reduction of the "green" tariff (adjustment coefficients) depending on the production technology and the date of commissioning of the power station;
- increasing the responsibility of RES producers for imbalances;
- additional guarantees of legal immutability.

2) Assessment of the impact of restructuring conditions on the solvency of RES producers within the credit programs.

On August 18, 2020, the National Bank of Ukraine adopted Resolution № 118, according to which it created flexible conditions for banks to restructure loans provided for the production of "green" electricity.

3) Repayment of debt until 31.12.2021.

The debt of the Guaranteed buyer for 2020 has been repaid in full, but in violation of the settlement schedules provided for in the Memorandum.

4) Timely and in full calculations.

Settlements between the Guaranteed Buyer and the producers were delayed and violated the terms of the electricity purchase and sale contracts.

As of 01.11.2022, the settlements for 2021 are 99%, for 2022 - 50%.

5) Financing of the "green" tariff.

The unjustified level of the tariff for the transmission of electricity does not allow the OSP to finance the deficit of the Guarantee Buyer's funds.

Cases of appeals to the Constitutional Court regarding recognition of the "green" tariff as illegal also

added significant risks. While the court is considering the case, the entire "green energy business" is in limbo.

Another negative factor for the sector is a number of orders of the Ministry of Energy, which violated the procedure for calculating generation with RES producers, due to which many RES producers were on the verge of bankruptcy for some time. Even maintaining

those projects that were launched was problematic. In this situation, financial institutions, which granted permission for loan restructuring and credit holidays, played a major role.

On the basis of the conducted analysis, we will highlight short-term and long-term projects of solutions to the mentioned problems. Including:

Table 1

Improvement of transmission mechanisms

The procedure for compensation for the unreleased energy of RES	Exit from the balancing group of the Guaranteed buyer with the right of return	Launch of "green" auctions	Avoidance of actions that worsen the conditions for RES projects
The resolution of the NEURC dated 24.06.2019 No. 1168 defines the procedure for calculation and compensation of electricity not released as a result of the execution of the OSP command (clause 4.18.12). The changes entered into force on January 1, 2021.	On July 29, 2022, Law 2479-IX was adopted with the relevant regulations, but it is impossible to apply them in practice for RES manufacturers due to the lack of regulatory and by-laws, which must be developed by the Regulator.	As of November 2022, the quotas have not been approved, and no "green" auction has been held	Additional responsibility for RES manufacturers for imbalances that are not caused by deviations of their generation schedules, due to the new formula for calculating the imbalance of the Guaranteed buyer (by the decision of the Supreme Court of Ukraine dated September 8, 2022 on recognizing the formula as illegal).

By the end of 2022

Creation of conditions for the successful completion of previously started RES projects and the launch of work on market measures.

1) overcoming technical risks associated with joining networks;

2) start work on preparation for activities aimed at:

- abolition of the mechanism of special duties and equalization of competition on the market;

- effective mechanisms for supporting RES and balancing capacities that will work in practice;

- ensuring legality and preventing violations and abuses in the process of regulating the electric energy market;

- expansion of opportunities for realization (sale) of electric energy on the foreign market (system of certificates of origin, or "green" certificates), etc.

By the end of 2023

- Economic predictability for new RES projects in the post-war period of energy system modeling and creation of development scenarios as a basis for updating the industry's strategic documents;

- review of development plans for distribution and transmission systems;

- adoption of final strategic documents - 6 months after the termination (cancellation) of martial law;

- completion of previously initiated market measures.

From 2024

Gradual access to foreign markets of sales of "green" energy:

- measures to ensure the integration of the electricity markets of Ukraine and the EU (European union);

- coordination of conditions and opportunities for exporting electricity from RES;

- compliance with the requirements of EU legislation, in particular, regarding state aid in the electricity market.

Conclusion: Solving the problems in the field of RES will allow producers of electricity from RES to gain stability, will contribute to overcoming the energy crisis and recovery of Ukraine with a focus on safe and sustainable energy. The development of renewable energy also has a global character - together with the European Union, Ukraine is developing a sphere that provides heat and electricity without the participation of the terrorist country Russia.

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