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USAGE OF ALTERNATIVE SOURCES OF ENERGY AND SAVING OF ENERGY RESOURCES IN UKRAINE: EXPERIENCE AND PROSPECTS

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The modern world is characterized by uncertainty, fluidity, fast changes. World energy, which is in the process of major changes, is not an exception. These changes are embodied in:

- the intensive implementation of the main renewable energy technologies in the context of corresponding decrease of their cost;
- the growing role of electricity in energy consumption compared to oil products all over the world;
- changes in the world economic and energy policy due to the intensive development of China's economy and the entry into the world market of growing shale gas and oil extraction in the United States [4].

In such conditions, Ukraine must take into account the world trends. The implementation of the latest modern technologies in the energy is highly important for our country, as Ukraine has one of the most energy-intensive economics in Europe. Almost half of the country's energy is consumed by the housing and utilities sector, which became outdated long time ago and now it needs to be renovated [9].

The problem is complicated by the fact that Ukraine, which consumes

more than 60–70 % of imported energy resources in the overall balance, is one of the most energy-dependent countries in Europe. It is forwarded not only by their absence, but also by their inefficient usage, which threatens the national interests and national security of the country. Therefore, solving the problem of energy saving and efficiency is one of the top priorities in the context of the energy crisis in the country [1].

The usage of alternative energy sources and energy saving in Ukraine has been relevant since the late 1990s, as it was clear that energy would not become cheaper any more, but this problem became the most relevant and important after 2014. The need to change the outdated technologies and approaches in energy sphere to the modern ones becomes obvious.

High energy intensity and low energy efficiency have been the main identifiers of the Ukrainian energy system for a long time. Beside the significant dependence on energy suppliers, Russian Federation in particular, the following disadvantages of extensive energy can be named: the deteriorating environmental situation in the country (high morbidity and mortality due to the air pollution caused by the operation and malfunctions of NPPs and CHPs), the necessity to upgrade worn-out equipment to get stability and security of their operation, all these require significant investment [7].

One of the commitments, made by Ukraine after the signing of the Association Agreement with the EU, is a compliance with the high European energy efficiency standards and participation in the energy market. Based on it, the priority of the country's energy policy is to increase energy efficiency and ensure energy saving.

The country and society must understand that capital investments related to the implementation of energy-efficient technologies will be paid off in the future. In particular, according to the data of the International Energy Agency (IEA), every dollar invested in energy efficiency will turn into 4 USD savings, and such project will be paid off in full in about four years [1].

As Ukraine tends to integrate into European institutions, we have a great interest in the European experience and requirements of energy saving. EU countries are actively encouraging the implementation of alternative energy sources: in particular by 2030 their share in the structure of electricity production should be 50%.

The energy strategy of Ukraine until 2030 was developed in 2006 for the first time. It identified energy saving as one of the determining factors for the efficient functioning of the national economy. In the Strategy it was assessed the overall energy saving potential due to the technical (technological) and structural factors [6, p. 35].

According to the energy strategy of Ukraine until 2035, the share of renewable sources of electricity generation in 2025 should be over 13 %,

and by 2035 – up to 25 % [10].

According to the materials of the joint project "Professionalization and stabilization of energy management in Ukraine", which is implemented under the Agreement of Partnership and Cooperation between the National Technical University of Ukraine "Kyiv Polytechnic Institute", Institute of Energy Saving and Energy Management (Ukraine) and Hochschule der Wirtschaft für Management (Germany), the main goals of country policy in the field of energy saving are:

- energy intensity reducing of GDP by 20% through the implementation of mandatory commercial accounting of energy resources consumption (energy and fuel), the transition to the usage of energy efficient technologies and equipment;
- ensuring the widest possible diversification of routes and sources of primary energy resources supply, including oil, natural gas, coal, nuclear fuel; increasing domestic energy production; implementation of the transparent competitive rules for the energy deposits development and usage;
- liberalization of the markets of the electric and thermal energy, coal and gas, transition to a new model of their functioning;
- integration of Ukraine's energy system to the continental European energy system ENTSO-E;
- reorganization of the public joint-stock company National Joint-Stock Company "Naftogaz Ukraine" in accordance with the Third Energy Package of the European Union;
- complete reformation of the system of pricing and tariffs for energy and fuel;
- reformation of the coal industry and attraction strategic investors; privatization of promising and liquidation (conservation) of unprofitable coal mining enterprises; modernization of the infrastructure of the fuel and energy complex [6, p. 37].

The state support for companies and households in the sphere of energy efficiency are foreseen by the legislative and regulatory acts of Ukraine: direct budget financing; exemption from VAT, import duty; exemption of the part of the profit from taxation; establishment of economically justified tariffs for housing services; provision of state guarantees for credit lines opened in credit institutions, etc. [4, p. 77].

Ukraine has The Energy Efficiency Program aimed to stimulate the population, Associations of Co-Owners of Apartment Buildings and Housing Cooperatives to implement energy efficiency measures by repaying part of the loan from the budget for energy efficiency measures, such as thermal insulation of the houses, purchase of boilers that using any types of fuel and energy (except natural gas and electricity), installation of water and heat metering units, heating radiators with a thermostat, replacement of

windows with energy efficient ones, modernization of lighting, etc. Since October 2014, the Government program of "warm" loans has been given to the population and condominiums, which provides the reimbursement from the state budget to make "warm" loans cheaper and additional compensation from local budgets [4, p. 80].

Currently, the dynamics of implementation of the new capacities of the renewable energy in Ukraine remains positive from year to year. In particular, solar energy is the most dynamic sector of renewable energy in Ukraine. Due to the large number of sunny days and moderate air temperature, solar stations, installed in Ukraine, work as efficient as possible. The development of the alternative energy is greatly facilitated by the high green tariff: for industrial solar power stations (SPS), built in 2017-2019, it is 15 eurocents; for SPS of a civil sample – 18 eurocents. Due to this and the relative availability of SPS, their approximate pay off period in Ukraine is 5–8 years [11].

The possibility of solar energy usage, i.e. the period of profitable operation of solar collector systems, depends on the climate conditions of the region [2, p. 94]. Due to the significant amount of the investment and the relatively

low cost, flat solar collectors, which are usually placed on the sunny sides of sloping roofs, have become the most widespread [5, p. 95].

The installed capacity of solar power stations in Ukraine in 2017 amounted to 742 MW, which is 211 MW more than the previous year [11]. During the first half of 2019, new stations of 1550 MW capacity, generating electricity from renewable energy sources, was installed in Ukraine. This is almost twice as much as for the whole 2018 (848 MW) [8].

The development of the wind energy is much slower than the solar energy development. It happens because the wind power stations are much more expensive than solar ones and are more complex to install and maintain. Besides, the wind energy is a more regulated industry than solar one [3].

Under the new legislation, since 2020 new objects of wind generation of more than 5 MW and objects of solar generation of more than 1 MW will need to participate in auctions to get guaranteed purchase of electricity by the country. As a result of such auctions, an auction price will be set for the electricity, taking into account possible surcharge of 5–10 % for the Ukrainian technologies usage. The auction model exists in many countries around the world and provides fair prices for alternative energy through auctions instead of a fixed green tariff, which is used in Ukraine and it is currently the highest in Europe. Those RES objects that offer the lowest tariff will receive state-guaranteed prices for a long period (up to 20 years) [3].

The thermal insulation of buildings continues to be of a great relevance for

Ukraine. About 50 % of heat is lost through the walls of the buildings, so an important step towards saving energy resources is the thermal insulation of residential and commercial buildings. The thermal insulation of foundations, walls and roofs of buildings is planned. Expanded polystyrene (ordinary and extruded) and mineral wool are usually used for this purpose. Recently, Ukraine experiences a real "boom" for the thermal insulation of buildings. It is a positive phenomenon, but often developers, contractors, building owners make some technological mistakes in the process of insulation, quite often in order to save money they use poor quality materials or hire unskilled workers.

Thus, it can be stated that over the past five years we have experienced the significant progress in the usage of alternative energy sources and energy savings in Ukraine, in particular, the great development is observed in the solar energy usage and thermal modernization of buildings. However, these processes are still quite slow, alternative energy is developing unevenly. Of course, the state support is very important, but domestic companies must take care of their energy security on their own, considering it as a necessary strategic decision that will have a significant impact in the future.

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STATE AND MAIN PROBLEMS OF AGRICULTURAL SECTOR DEVELOPMENT AS INTEGRAL PRODUCTION SYSTEM OF THE NATIONAL ECONOMY

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Production activity of agricultural enterprise in modern conditions depends on how successfully the problems connected with competitiveness of products are solved. Only by solving this task, enterprise can function effectively and develop in market environment [1].

Improving the efficiency of agricultural enterprises is largely determined by ensuring conditions of competition, namely the transparency of commodity markets functioning, promoting coordinated actions of national economic subjects aimed at increasing their competitiveness in international commodity markets, provided that competition in corresponding internal commodity markets is not eliminated or restricted [2].

The formation of competitive advantages of agricultural enterprises

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