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## Economic Strategy of the Development of Renewable Energy in Rural Areas of Ukraine

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### ABSTRACT

Managing the development of renewable energy in rural areas is a national level priority in the context of the European course of Ukraine. Against this backdrop, rural territories serve as a platform for the formation and implementation of a strategy for the active implementation and use of renewable energy. The purpose of the study is to justify the strategic benchmarks concerning managing the development of renewable energy in rural areas as a determining factor in the sustainable energy supply of domestic production. The object of the study is renewable energy in rural areas. The subject of research is the process of developing renewable energy. The scientific hypothesis of the research is the assumption that increasing the consumption of renewable energy sources will contribute to the sustainable development of rural areas. The results of monitoring the nature and peculiarities of renewable energy sources consumption over the past 10 years enabled to carry out a strategic forecast of the change in the share of renewable energy in the overall structure of energy consumption of Ukraine. The obtained forecast data (taking into account the dependence of the profitability of the introduction of renewable energy on the green tariff rate) indicate that in 2020, the share of renewable energy sources in the gross final consumption of Ukraine should be expected to increase to 12%. Such indicator exceeds the obligations of Ukraine according to the EU Directive 2009/28/EC of the European Parliament on the development of renewable energy. A SWOT-analysis was carried out based on revealed positive dynamics in the development of all sub-sectors of renewable energy. Elements of the formed matrix prove the necessity of implementation of the development strategy. This strategy, based on the configuration of opportunities and strengths, will allow neutralizing the effects of identified threats, promoting diversification of domestic energy supply in rural areas and having positive economic, social and environmental effects.

## INTRODUCTION

Under the current level of national energy dependence, the exhaustion of world oil, gas and coal reserves, the continuous deterioration of the environment, the inadequate level of environmental responsibility for doing business, the issue of increasing the consumption of renewable energy sources is becoming more urgent. It is especially important to develop the necessary management mechanisms and tools for activating the use of renewable energy in rural areas, which is a logical platform for their development. Rural territories occupy a significant part of the total area of Ukraine and are characterized by relatively advantageous geographical location, favourable natural-resource, climatic and other conditions for conducting economic activity. The expediency of the above is also explained by the strengthening of the autonomy of rural areas and amalgamated territorial communities in the context of the active implementation of the decentralization of authority. Their place and importance in the formation of the energy independence of Ukraine emphasize the relevance of the raised problem.

## 1. LITERATURE REVIEW

References about the use of alternative energy sources coincide with the 18th century AD. The B. de Belidor (1819) first described the principles of hydraulic engineering in his work *Hydraulic Architecture*. Later, the A. Becquerel (1868) discovered the phenomenon of the photoeffect and the principle of operation of the solar battery. At the same time, the W. Armstrong (1868) introduced the world's first hydroelectric power station. A significant impetus for the development of renewable energy was resolution No. 33/148 of the United Nations General Assembly (1978), which outlined the prospects of popularizing this direction around the world. An understanding of the policy for setting the goals of implementing renewable energy is considered in *The Adaptive Management of Renewable Resources* by C. Walters (1986). T. Olli and K. Jari (1993) first analysed the model of economic growth, which allows a smooth replacement of emissions with reproducible capital. The work of researchers R. Hilborn, C. Walters and D. Ludwig (1995) became known among scientists. In that work the researchers argued that the presence of a reproductive surplus determined by the equilibrium between birth, death and somatic growth leads to the possibility of a stable exploitation of renewable resources. In their work, G. Boyle (2004) explained in detail the basic physical and technological principles of using renewable energy sources, demonstrated the prospects for their receipt from different sources of renewable energy, and considered their impact on the environment. In the context of global warming and growing energy security issues, tools for stimulating the development of renewable energy sources at the state level play the key role in their production. An illustrative example is the Italian experience of applying various types of subsidies, namely green certificates and a diversified tariff system. The problems of their implementation in reality and the challenges faced by the national government were described in the writings of G. Panella, A., Zatti and F. Carraro (2011).

The countries of the European Union pay special attention to combating climate change. Representatives of the European Commission believe that energy security and climate change are inseparable concepts. Therefore, in order to develop renewable energy in the energy balance, the European Commission uses its own policy tools to regulate greenhouse gas emissions into the atmosphere. The effectiveness of the European Union policy regarding the promotion of renewable energy was considered by T. Alexopoulos, D. Thomakos and D. Tzavara (2012). The authors described the effect of reducing greenhouse gas emissions in order to mitigate climate change after the implementation of the first directive (2001/77/EC). In their work, they substantiated the role of regulating the production of renewable energy sources and various policy measures to reduce emissions.

Potential opportunities for the integration of renewable energy sources in rural areas are investigated by Ukrainian scientists V. Kozysjkyj, V., J. Tughaj, V. Bodunov, and O Ghaj, (2011). The

authors proposed to introduce a dynamic tariff for distributed generation of energy and to transfer management functions from the owner of generating capacities to a single centralized control system. Peculiarities of the implementing renewable energy in rural areas are reviewed by S. Long (2007). The author identified promising approaches for overcoming economic and financial barriers to the deployment of renewable energy systems in the context of rural China. He described three large-scale renewable energy rural programs that would be useful for implementing in other countries.

Prospects for the development of the renewable energy market are considered in detail by Y. Yevdokimov, O. Chygryn, T. Pimonenko, and O. Lyulyov (2018). They indicate that, according to Ukrainian potential, biogas is the most promising alternative resource. In addition, the authors determined that sugar factories, corn silage and poultry farms have the highest potential of biogas. The financial and economic aspects of the implementation of renewable energy sources, in particular biofuels, are considered in the works of M. Myronenko, O. Polova, A. Prylutskiy, and O. Smoglo (2017). They believe that biofuels can completely replace traditional energy resources, increase the level of economic efficiency of production and competitive ability of the national economy, and also reduce the amount of harmful emissions into the environment. However, in our opinion, the complete replacement of traditional energy resources with exclusively biofuels can lead to the intensive deterioration of agricultural land and higher prices for agricultural products. The above context is a confirmation of the need to develop renewable energy not only in a separate sector, but in all sub-sectors in the complementary relationship between them. Scientific research is based on the experience of advanced countries and is aimed at their practical implementation in Ukraine. However, despite a significant amount of scientific works, the issue of the development of renewable energy in rural areas is not sufficiently studied, which determines the choice of the study. An important component of the development of renewable energy is the issue of investment, as argued by S. Kozlovskiy, Y. Gerasymenko, V. Kozlovskiy (2010) and V. Tkachuk, N. Kravchuk, O. Kilnitska, and K. Shevchuk (2016). They state that the development of the agricultural sector of Ukraine is possible only under the conditions of attracting investments and developing new forms of energy, namely, renewable and alternative.

## 2. AIMS

The purpose of the paper is the theoretical underpinning of strategic benchmarks concerning managing the development of renewable energy in all sub-sectors. Proved the opportunity of the implementation of the commitment that Ukraine undertook in accordance with the EU Directive 2009/28/EC on renewable energy by the end of 2020 provided that hidden development reserves of renewable energy are realized and key threats are neutralized. Implementation of the strategic benchmarks will promote diversification of domestic energy supply in rural areas and have positive economic, social and environmental effects.

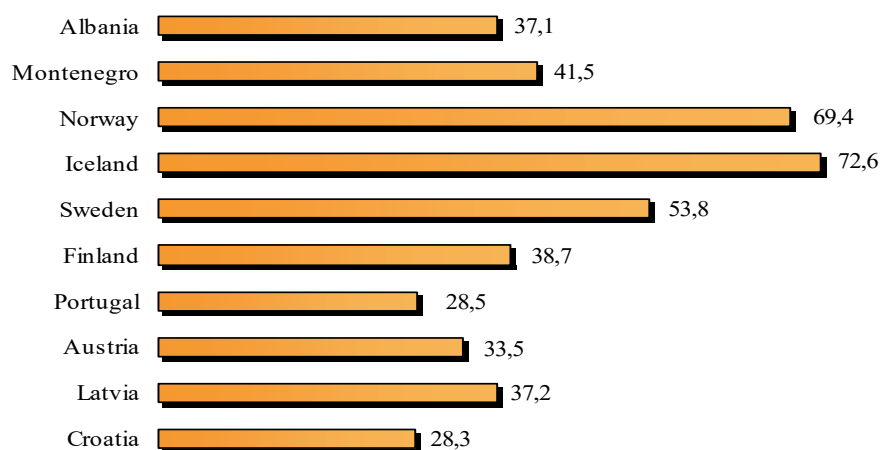
## 3. METHODOLOGY

The scientific hypothesis of the research is the assumption that increasing the consumption of renewable energy sources will contribute to the sustainable development of rural areas. The theoretical and methodological basis of this study is a systematic approach to the study of socioeconomic phenomena and processes related to the development of renewable energy in rural areas. In the course of the research, the following general scientific and special scientific methods were used: abstract-logical, in particular methods of induction and deduction (to interpret the scientific vision of the essence and expediency of activating renewable energy in rural territories, to formulate conclusions and proposals); economic-statistical (to analyse the current state of renewable energy in rural areas); dynamic modelling and forecasting (to predict the change in the share of

renewable energy in the overall structure of energy consumption); SWOT-analysis (to identify strategic directions for the development of renewable energy according to sub-sectors in rural areas); descriptive analysis (to substantiate branch features of renewable energy); heuristic method (to generate options for solving the problem under study, in particular for the theoretical substantiation of the prospects for the development of renewable energy in rural areas, provided that the elaborated development strategy is implemented on the basis of diversification); graphic (to visually display the results of the study). The advantage of this article is the author's approach to the study of the problem, to proving its relevance and timeliness. This involves the configuration of system and marketing approaches to determining the possibilities and directions of sustainable development of rural areas through the activation of renewable energy sources based on the implementation of diversification strategy. The methodological platform for further research in this direction is the elaboration of adaptive models of renewable energy development in rural areas, outlining the implementation mechanisms.

## 4. RESULTS

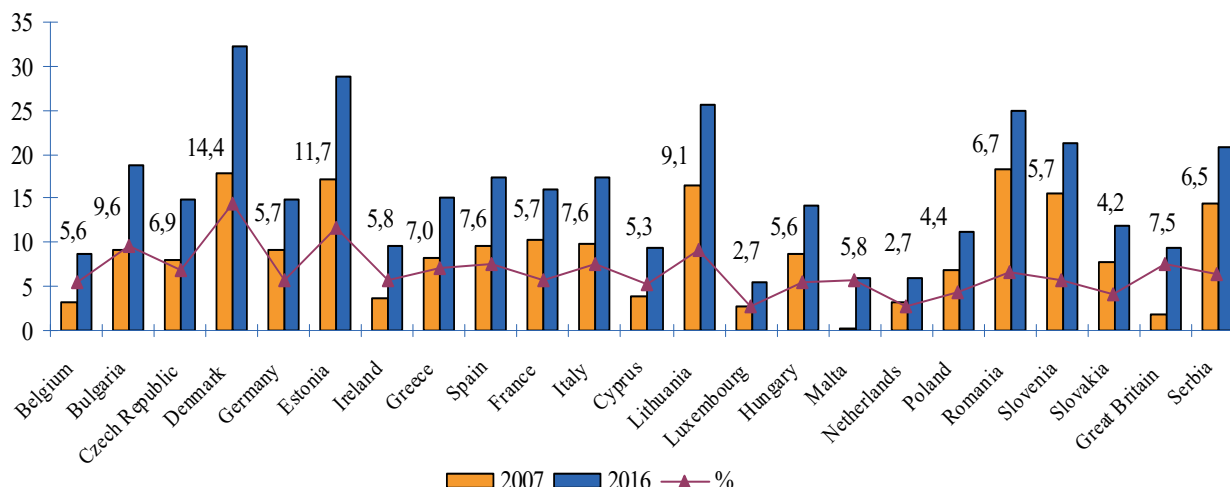
According to current legislation, renewable sources of energy include renewable non-fossil energy sources, in particular solar, wind, aerothermal, geothermal, hydrothermal energy, energy of waves and tidal energy, hydroenergy, biomass energy, gas from organic waste, gas from sewerage plants, biogas. An alternative energy sector is the one, which provides the development of electric, thermal and mechanical energy from alternative sources of energy. This direction is ranked as a priority for most developed countries of the world. Iceland, Norway, Sweden, Montenegro, Finland and Latvia are the absolute leaders by the indicator Share of renewable energy in gross final energy consumption (Fig. 1), which was designed to measure EU progress in reaching the 2020 and 2030 renewable energy goals. Iceland managed to reach 72.6% of renewable energy in gross final energy consumption of the country, Norway reached 69.4%, Sweden 53.8%, Montenegro 41.5%.



**Figure 1.** Share of renewable energy sources in the gross final consumption of the country, % (2016)

Source: compiled and calculated according to the data of the European Commission. Eurostat.

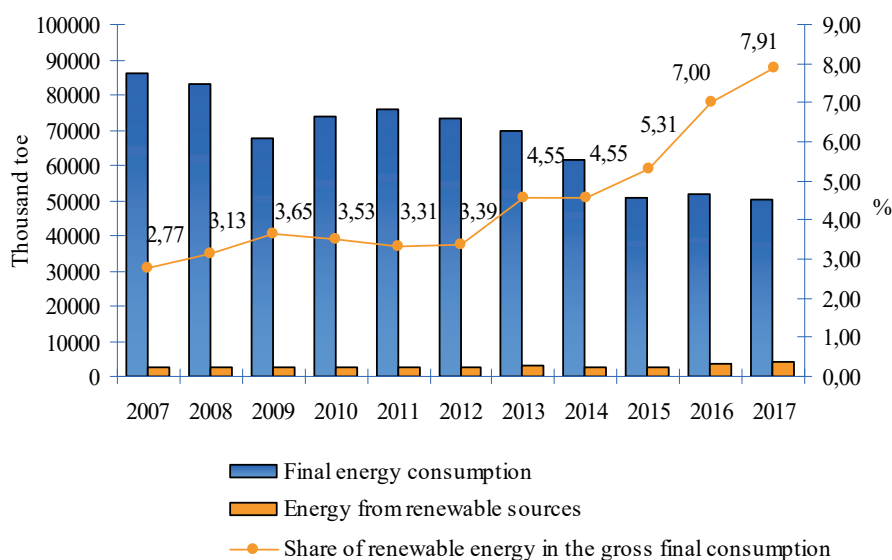
The research established that in order to activate and encourage the use of energy from renewable sources, the requirements of EU Directive 2009/28 were ratified and adopted. These requirements set obligatory national target indicators for renewable energy consumption for the European Union countries. Namely, by 2020, the share of renewable energy in their final consumption should reach an average of 20% and by the end of 2030 – 27%. After setting strategic goals, EU countries are actively aspiring to achieve them (Fig. 2).



**Figure 2.** Increment of the share of renewable energy sources in the gross final consumption of the EU countries, %

Source: compiled and calculated according to the data of the European Commission. Eurostat.

Over the past 10 years, the largest increment in the consumption of renewable energy was in Denmark (14.4%), Estonia (11.7%), Bulgaria (9.6%), Lithuania (9.1%), Spain (7.6%), Greece (7.0%), the Czech Republic (6.9%), Romania (6.7%), Serbia (6.5%), Germany and France (5.7%), Hungary (5.6%) and Slovenia (5.7%). These countries achieved the strategic goals set for the EU countries by 2020 for the period of 2016. The other EU member states are actively working to increase the rate of energy consumption from renewable sources. The use of renewable energy is important both at the national and international levels in the energy potential of Ukraine, since according to the Directive 2009/28 of the European Parliament, Ukraine undertook a commitment to reach 11% of the energy consumed from renewable sources by the end of 2020 in the overall structure of energy consumption in the country. The increase in the share of energy from renewable sources in the gross final energy consumption is shown in Figure 3.



**Figure 3.** Dynamics of the increase in the share of renewable energy sources in the gross final consumption of Ukraine, %

Source: compiled and calculated according to the data of the State Statistics Service of Ukraine.

During 2007–2017, the growth of the indicator of renewable energy consumption in Ukraine was 5.14%. The formation of favourable conditions for the development of renewable energy began with the adoption of the Law of Ukraine “On Alternative Energy Sources” in 2003 [9]. At the time of the introduction of norms for stimulating the development of renewable energy, a certain number of such facilities were already functioning. Nevertheless, the adoption of the law significantly intensified the construction and commissioning of new plants generating energy from renewable sources. As of today, Ukraine continues to be at the forefront in terms of the development of renewable energy in our country. The confirmation of this is the updated Energy Strategy of Ukraine for the period up to 2035 “Security, Energy Efficiency, Competitive Ability” approved by the Government on 18 August, 2017. The key tasks of that strategy are the reform of energy companies in accordance with Ukraine’s obligations within the framework of the Treaty establishing the Energy Community, an increase in gas extraction, reduction of GDP energy intensity and further development of renewable energy sources.

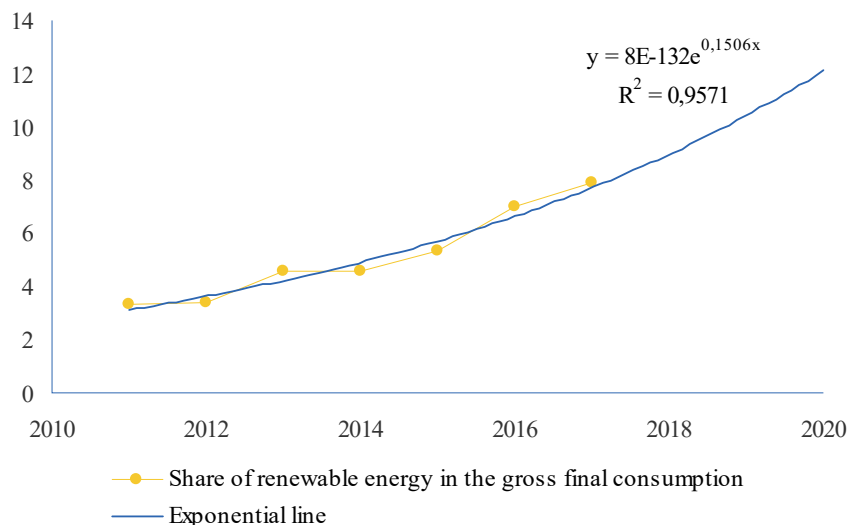
The study of the nature of the development of renewable energy in dynamics makes it possible to model the change in the share of energy produced from renewable sources in the overall structure of energy consumption for the future, which implies aims of the analysis of the deployment of all processes in time. As a rule, differential calculus and differential equations are used for modelling continuous processes. The application of such a dynamic model allows us to investigate not only the dependence of variables on time but also their interrelation in time. At the point of time  $t$ , the specific gravity of the energy received from renewable sources is  $P_t$ . Accordingly, the initial value of specific gravity is  $P_0$ . The change in the specific gravity of renewable energy will be expressed through the difference  $P_t - P_0$ . The growth rate of the specific gravity of energy produced from renewable sources at each point of time  $t$  is proportional to the introduced generating capacities with a coefficient of proportionality equal to the average percentage  $r$  of continuous growth of generating capacities. The level of profitability is a factor that influences the rate of change in the production of energy from renewable sources, and therefore its share in the structure of production or consumption. The profitability of renewable energy depends to a large extent on the green tariff rate. Thus, it is appropriate to describe the change in the share of renewable energy in gross final consumption with the help of the differential equation of the first order:

$$\frac{dP(t,g)}{dt} = kP(t,g) \quad (1)$$

where  $P(t)$  – the share of renewable energy in the gross final consumption at the time  $t$ ;

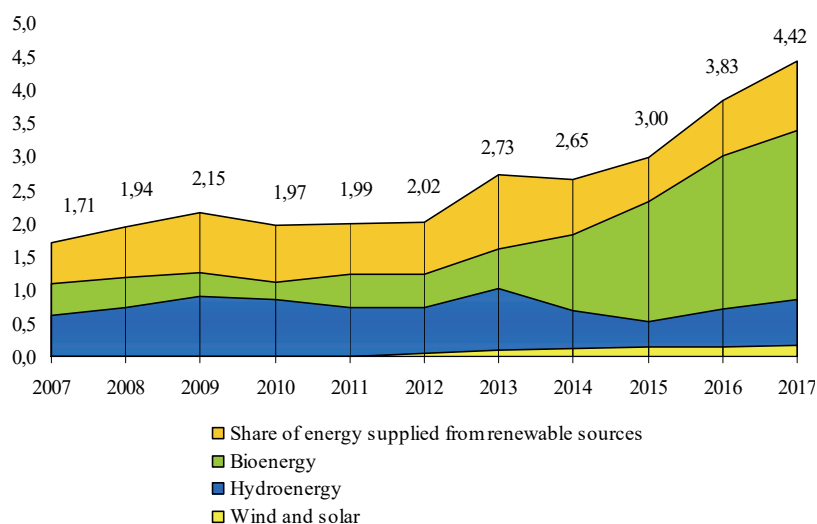
$\frac{dP(t,g)}{dt}$  – the rate of change in the share of renewable energy in the gross final consumption.

Modelling of the share of renewable energy in gross final consumption is extremely sensitive to external and internal factors, changes of which are virtually impossible to predict in the future. To simulate a part of the renewable energy it is possible to use the theory of fuzzy logic, which is successfully used to predict economic processes in the agrarian sector (Kozlovskiy, Mazur, Vdovenko, Shepel, and Kozlovskiy, 2018). But in our case it is enough to use classical mathematical methods - differential equations. Therefore, it is proposed to forecast the share of renewable energy only for the next three years (Figure 4).



**Figure 4.** Forecasting the share of renewable energy sources in the gross final consumption of Ukraine, %  
 Source: compiled by the authors.

The identified trend shows that in 2020 growth of the potential of renewable energy is expected to reach 6 million toe and the share of renewable energy in Ukraine's gross final consumption will reach 12%, which exceeds the commitment that Ukraine undertook in accordance with the EU Directive 2009/28/EC on renewable energy development by the end of 2020. Looking forward, Ukraine intends to develop all sub-sectors of renewable energy, which will accelerate its growth rate. The dynamics of the share of renewable sources for the period 2007-2016 is shown in Figure 5. This dynamics can be really achieved using the methods of state incentives for the development of the Ukrainian agrarian sector, as indicated in the study S. Kozlovskiy, R., Grynyuk, O., Baltremus, and A., Ivashchenko (2017).



**Figure 5.** Dynamics of the share of energy supplied from renewable sources, %

Source: compiled and calculated according to the data of the State Statistics Service of Ukraine.

SWOT-analysis was carried out to identify the strategic directions for the development of renewable energy in sub-sectors in rural areas. The analysis consisted of three stages: a) identification of strengths (hidden reserves for the development of renewable energy in main sub-sectors) and weaknesses; b) identification of the opportunities of implementation of renewable energy in rural areas; c) identification of key threats. Identification of the strengths and weaknesses of the development of renewable energy involves determining the current state of each of its sub-sectors (Table 1).

**Table 1.** Strengths and weaknesses of the development of renewable energy in rural areas

<i>Factors of development</i>	<i>Grading factors according to sub-sectors</i>			
	<i>Solar energy</i>	<i>Wind energy</i>	<i>Hydroenergy</i>	<i>Bioenergy</i>
Easy to install	+	+		
Easy to use	+	+		
Safe for the environment	+	+	+	+
Seasonality	+	+		+
Renewability and inexhaustibility of energy	+	+	+	+
Territorial dependence			+	+
System modularity	+	+		
High cost of equipment	+		+	
Difficult to register	+		+	
Needs considerable area	+	+		+
Soil erosion				+
Insufficient support from the state		+	+	+
Transporting raw materials to the place of their processing				+
Technological flexibility				+
Investment attractiveness	+	+		+
Contributes to the development of rural areas	+	+	+	+
Noise pollution		+		

Source: compiled by the authors.

Identifications of opportunities for renewable energy implementation is based on a special matrix, which involves the ranking of opportunities depending on the probability of their implementation (high, average, low) and the degree of their impact on the development of rural areas (strong, moderate, slight). Influence on the development of rural areas is determined on the basis of the weight of available opportunities. For example, obtaining additional funding is assessed as an opportunity that has a strong impact on the economic activity of the industrial and social infrastructure objects of rural areas. The innovation update of the energy sector in accordance with world standards implies integration with the energy sector of the EU and the possibility to enter the international energy markets. An opportunity for modern business is the state incentive to attract investments in the technology of using renewable energy sources through the use of the green tariff. At the same time, getting this privilege in Ukraine is valid only until 2030.

It is possible to increase the level of development of rural areas by reducing the dependence of enterprises on traditional energy resources and replacing them with alternative energy. This is directly related to the economic efficiency of business entities and the production of more competitive agricultural products. Given that the growth of efficiency of agricultural production is estimated to be relatively slow (annual profitability of agricultural enterprises is rising by an average of 4 pp, but this is still not enough to overcome the unprofitability) and requires serious transformations both in the internal and external environment enterprises, the probability of realization of the opportunity is defined as average. Among the main measures for the development of renewable en-



ergy is the need to form a conscious energy-efficient and energy-saving population at the state and local levels. Only under such conditions one can guarantee the preservation of the ecosystem of the rural territories, maintenance of the ecological balance and, consequently, the conservation of biodiversity in the area. As a result of achieving the level of energy self-sufficiency and independence of agricultural business entities, there occurs an opportunity to reduce the cost price of manufactured products. As a consequence, one can expect an increase in the profitability of agricultural producers and, accordingly, diversification of business, development of social infrastructure in rural areas, growth of wages and creation of new jobs, and also the development of rural areas. The results of the analysis of the opportunities of implementation of renewable energy in rural areas are provided in Table 2.

**Table 2.** Matrix of the opportunities of the implementation of renewable energy in rural areas

<i>Probability of using the opportunity</i>	<i>Impact of an opportunity on the development of rural areas</i>		
	<i>strong</i>	<i>moderate</i>	<i>slight</i>
High	Opportunity to get additional funding from international organizations	Decreasing the tax burden through the use of green tariff	Reducing the dependence on traditional fossil resources
Average	Economic activation of rural territories	Formation of energy-efficient and energy-saving society	Innovation update of energy sector according to the world standards
Low	Guaranteeing energy balance and preservation of ecosystem	Achieving the level of energy self-sufficiency	Integration into the EU energy sector

Source: compiled by the authors.

A number of threats to the implementation of renewable energy in rural areas were distinguished. They include a change in the state policy, in particular the change in the taxation scheme and the reduction or termination of the use of the green tariff; political instability; non-transparency and overburdened bureaucracy. In our opinion, the most probable is the wearing out of the energy supply system and the technological backwardness of the energy sector, the non-compliance with world standards. Above all, this is due to the annual shortage of the state budget (in 2017 it was UAH 47.9 billion), as well as the necessity of changing the domestic legislation in accordance with the requirements of the WTO. Somewhat less likely is the impossibility of forecasting the production of renewable energy and the long-term profit. The impact of nature and climatic conditions, the exclusion of agricultural land from the circulation for SPP and WPP is considered unlikely, although it threatens the raise of prices for agricultural products and raw materials. At the same time, the development of such power plants has a significant impact on the landscape and infrastructure of rural areas. The above and other threats are compiled into the matrix of threats of implementation of renewable energy in rural areas (Table 3).

**Table 3.** Matrix of the threats of the implementation of renewable energy in rural areas

<i>Probability of the implementation of threat</i>	<i>Impact of an threat on the development of rural areas</i>		
	<i>strong</i>	<i>moderate</i>	<i>slight</i>
High	Non-transparency and bureaucracy	Wearing out of energy supply systems	Technological backwardness
Average	Impossibility to forecast the production of renewable energy and profit in the long term	Increasing competition at the energy products market	Political instability
Low	Exclusion of agricultural land from the circulation for SPP and WPP	Dependence on natural and climatic conditions	Negative impact on the landscape

Source: compiled by the authors.

The most important and effective methods for raising the level of economic activity in rural areas is the creation of an effective energy supply system aimed at achieving partial energy autonomy of objects of social and industrial infrastructure, attracting investment funds and forming a modern energy-saving society. At the same time, special attention should be paid to the threat of a rapid change in the taxation policy of the state, the deterioration of the investment climate and the growth of competition at the energy products market. The presented threats are external to the subjects of entrepreneurship; they can be eliminated only at the macro level. In this case, enterprises should continuously monitor and develop appropriate measures to reduce the impact of existing threats in order to increase their own security. It is essential to elaborate a strategy that will enhance the strengths of renewable energy and promote the diversification of domestic energy supply in rural areas (Table 4). Also, such opportunities as attracting additional investment resources, using business insurance, improving the level of technical support, organizing a system of incentives to eliminate the weaknesses of the implementation of renewable energy in rural areas of Ukraine should be implemented.

**Table 4.** Matrix of the SWOT-analysis of the development of renewable energy in rural areas

<i>OPPORTUNITIES</i>	<i>THREATS</i>
Economic activation of rural territories	Political instability
Innovation update of energy sector according to the world standards	Exclusion of agricultural land from the circulation for SPP and WPP
Achieving the level of energy self-sufficiency	Impossibility to forecast the production of renewable energy and profit in the long term
Guaranteeing energy balance and preservation of ecosystem	Increasing competition at the energy products market
Reducing the dependence on traditional fossil resources	Dependence on natural and climatic conditions
Formation of energy-efficient and energy-saving society	Technological backwardness
Opportunity to get additional funding from international organizations	Non-transparency and bureaucracy
Integration into the EU energy sector	Wearing out of energy supply systems
Decreasing the tax burden through the use of green tariff	Negative impact on the landscape
<i>STRENGTHS</i>	<i>WEAKNESSES</i>
Environmental compatibility due to the absence of chemical reaction of fuel combustion	Lack of information among potential consumers
Easy to maintain	High cost of equipment for generating energy
Promoting the diversification of production	Absence of energy market in the country
Production of renewable energy is a continuing source if compared to fossil fuel	State policy in the field of renewable energy is not favourable enough
Favourable natural and climatic conditions of the greater part of the country	Need for large areas for placement of SPP and WPP
No waste and no need to dispose it	Low interest of investors in the development of renewable energy
Creation of new jobs	Complexity of economic transformations
If used properly, a long operating life is preserved	Imperfection of normative legal documents
One-time investment	Deprofessionalisation in the energy sector
No expenses on fuel for producing energy	Difficult procedure of getting permission for such activity
General availability of the use of renewable energy	Creation of excessive noise due to the use of WPP

Source: compiled by the authors.

Summarizing the above, it should be noted that the development of alternative energy sources is environmentally safe and, at the same time, an economically profitable type of activity. Implementation of renewable energy in rural areas will have positive economic, social and environmen-

tal effects. However, business entities, social infrastructure objects and rural population are facing a significant amount of threats in the process of implementation. The decisive influence on the level of development of rural areas is the technological backwardness, the wearing out of energy supply systems and excessive bureaucracy concerning the commissioning of power plants that operate on renewable energy sources. At the same time, these are also the most problematic issues for the rural enterprises and the population. Therefore, special attention should be paid to the development of effective measures that would be based on strengthening the weaknesses through the implementation of appropriate opportunities and maximum elimination of existing threats, which will improve the economic efficiency of the functioning of agricultural entrepreneurship and increase the economic activity of rural areas.

## CONCLUSION

According to the results of the study, the following conclusions were made:

- The issue of the development of renewable energy is a priority both on the national and international scale. Intensification of energy dependence threatens energy security and independence of Ukrainian rural areas, complicates the implementation of the principles of their development in the context of the European integration course. Taking into account that our state is positioned on the world stage as an agricultural country with an extremely powerful and promising resource potential, rural areas are a platform for intensifying the development of renewable energy.
- The forecast of the change in the share of renewable energy in the overall structure of energy consumption was made on the basis of monitoring the nature of the dynamics of renewable energy development. Data of the medium-term strategic forecast indicate that in 2020 the growth of renewable energy potential is expected to reach 6 million toe, while the share of renewable energy in gross final consumption of Ukraine will reach 12%. This indicator will exceed the commitment that Ukraine undertook in accordance with the EU Directive 2009/28/EC on renewable energy by the end of 2020 provided the efficient management of the renewable energy development.
- All types of renewable energy sources play an important role in achieving the strategic forecast indicator. In order to outline strategic benchmarks for the development of renewable energy in all sub-sectors, SWOT-analysis was conducted. Elements of the formed matrix indicate the importance of strengthening revealed capabilities such as attracting additional investment resources, using business insurance, improving the level of technical support, organizing a system of incentives. It will help to neutralize the effects of identified threats, promote diversification of domestic energy supply in rural areas and have positive economic, social and environmental effects.

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