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DETERMINATION OF THE FACTORS FOR POSITIONING “GREEN” ENERGY AS A CLIMATE NEUTRAL PRODUCT IN THE ENERGY MARKET

ВИЗНАЧЕННЯ ФАКТОРІВ ПОЗИЦІОНУВАННЯ “ЗЕЛЕНОЇ” ЕНЕРГІЇ ЯК КЛІМАТИЧНО-НЕЙТРАЛЬНОГО ТОВАРУ НА ЕНЕРГЕТИЧНОМУ РИНКУ

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Abstract. *The article is devoted to determining the factors of positioning “green” energy as a climate neutral product in the energy market based on the segmentation. Analysis of the factors involved in the formation of a segment of “green” energy in the energy market made it possible to establish a global trend towards a decrease in demand for such types of energy as gas, oil, coal, and nuclear energy. But, taking into account the general trend of falling demand for electricity, a positive trend in the consumption of “green” electricity obtained from alternative energy sources has been revealed. To assess the level of interaction of the “green” energy segment with other segments of the energy market, the energy market was segmented by factors. The result of this segmentation was the definition of directions for the development of the energy market, based on the use and consumption of energy from natural non-renewable sources, the production and consumption of alternative energy (“green” energy), as well as energy services.*

Key words: *climate change, renewable energy sources, sustainable development, alternative energy, energy and environmental security, market segments.*

Introduction.

The change in the population value orientations towards the growth of the sustainable development role has intensified under the influence of overcoming the consequences of the COVID-19 impact. Awareness of the limited natural resources and the importance of preventing climate change lead to consider the issues of strengthening environmental and energy security both locally and globally. Sharing, moving away from fast fashion, digitalization of services and business processes, waste recycling, biodiversity conservation, development of renewable energy, the use of electric vehicles (electric cars, bicycles), popularization of energy management in households and business entities are becoming trends.

The European Green Deal, adopted by the European Commission in December 2019, approved a course towards climate neutral development of the economy and society until 2050 and became another reboot of the energy policy of states aimed at preserving the environment and preventing climate change. On the way to the implementation of such a climate neutral development in the European Union countries, the priority is to focus on the development of the field of alternative energy. In this context, the role of applying a partnership approach to enhancing the effectiveness of environmental activities on a global scale, both between the countries of the European Union and non-EU countries, is growing.

For the measure implementation to strengthen the environmental and energy security of countries, it is important to develop the energy sector of the economy



based on competition, to introduce an energy management system in households and enterprises [1], as well as to develop new segments of the energy market, in particular in the field of alternative energy [2-3], the energy service market [4-6], as well as to form a municipal environmental policy and environmental sustainability of the agriculture and transport sector [7-10] as an environment for the implementation of such a climate neutral product in the energy market as “green” energy. In accordance with this, it requires a deepening of the essence of the role, peculiarities of “green” energy market mechanism formation and the factors of positioning green energy as a climate neutral product in the energy market.

The main text.

To ensure environmental and energy security at all levels of economic development, it is necessary to introduce energy efficient technologies, the content of which is to reduce the costs level for the production, storage, supply and consumption of the corresponding type of energy, and, as a result, reduce the harmful impact on the environment. Another important aspect is to provide consumers with access to cheap and ecological sources of energy through the development of a green energy market and the formation of high-quality energy services.

Ukraine, which supported the implementation of the provisions of the European Green Deal, adopted the Concept of Ukraine’s green energy transition by 2050. According to the Concept, measures are envisaged aimed at:

- ensuring energy efficiency and increasing energy saving (industry, buildings, heat power engineering);
- use of renewable energy sources (solar energy, wind energy, bioenergy);
- decarbonization and greening of transport by switching to electric transport (urban, intercity, freight, private);
- waste management and implementation of a circular economy;
- digitalization and technological changes in energy supply and distribution systems (launch of Smart grids);
- support for research and development work and innovations for the development of green energy and ensuring energy, environmental safety of Ukraine.

According to the forecast data [11] in 2040, half of the world’s energy will be consumed in the form of electricity, while the increase in production and consumption will be carried out due to renewable energy sources (Table 1).

Table 1 – Forecast of energy consumption structure in the world by fuel type, percent

Type of energy	2017	2040	Deviation between 2040 and 2017
Renewable energy sources	4	15	+11
gas	23	26	+3
hydropower	7	7	0
atomic energy	4	4	0
oil	34	27	-7
coal	28	20	-8

Source: [12]



For example, the implementation of the Concept of green energy transition of Ukraine by 2050, according to the Ministry of Energy and Environmental Protection of Ukraine, provides a transition to environmentally friendly transport by using 70% of renewable energy sources in electricity generation, the introduction of smart grids and a reduction to 0% of the share of coal-fired thermal power plants in the energy sector.

To enhance the energy efficiency of households and prevent climate change, the practice of switching to electric vehicles and the development of electric charging stations are being introduced. In the countries of the European Union, households and the service sector (offices, shops, hospitals, schools, etc.) are typical sources of electricity for transport users. For example, according to the results of a study [8], in the Netherlands, car refueling is carried out only in private battery stations. In addition, the following three models of behavior of electric vehicle drivers are identified, depending on access to charging stations and the form of management of ensuring the green energy supply: 1) electric cars are always charged at maximum power (until the batteries are full); 2) electric vehicles are always charged at maximum power until the battery level is at a certain minimum level; 3) electric vehicles are charged in the case of available additional opportunities for obtaining renewable energy. It has been found that in the absence of central control, electric vehicle are charged at maximum power when there is additional renewable energy available.

According to the report by the International Energy Agency [13], global energy demand declined by 3.8% in the first quarter of 2020, with most of the impact occurring in March, when Europe, North America and other countries applied restrictive measures. The global demand for coal was hit hardest, declining by almost 8% compared to the first quarter of 2019, oil demand declining by almost 5%, gas demand declining by about 2%. At the same time, there was a drop in demand for electricity by 20%, primarily for that which was produced from traditional energy sources (oil, gas, coal, nuclear energy). On the other hand, the positive dynamics of growth in demand for electricity from renewable sources, as well as directly to renewable energy sources (solar energy, wind energy, hydropower, geothermal energy), as well as bioenergy (biofuels and waste energy production) is being monitored. In particular, in the context of statistical data [14], in 2018, there was a trend towards an increase in electricity production from renewable energy sources, biofuels and waste.

Undoubtedly, this indicates a change in consumer behavior when choosing various types of energy (for example, the loyalty of transport users to “green” energy services [15], an increase in environmental and energy awareness of the population, the development of municipal ecology, the introduction of energy management at enterprises. In addition, there is an increasing need to use modern marketing tools to raise public awareness of the transition to renewable energy sources.

Figure 1 shows the segmentation of the energy market by factors, which allows you to highlight the directions of the energy market development based on the use and consumption of energy from natural non-renewable sources, the production and consumption of alternative energy (“green” energy), as well as energy services.

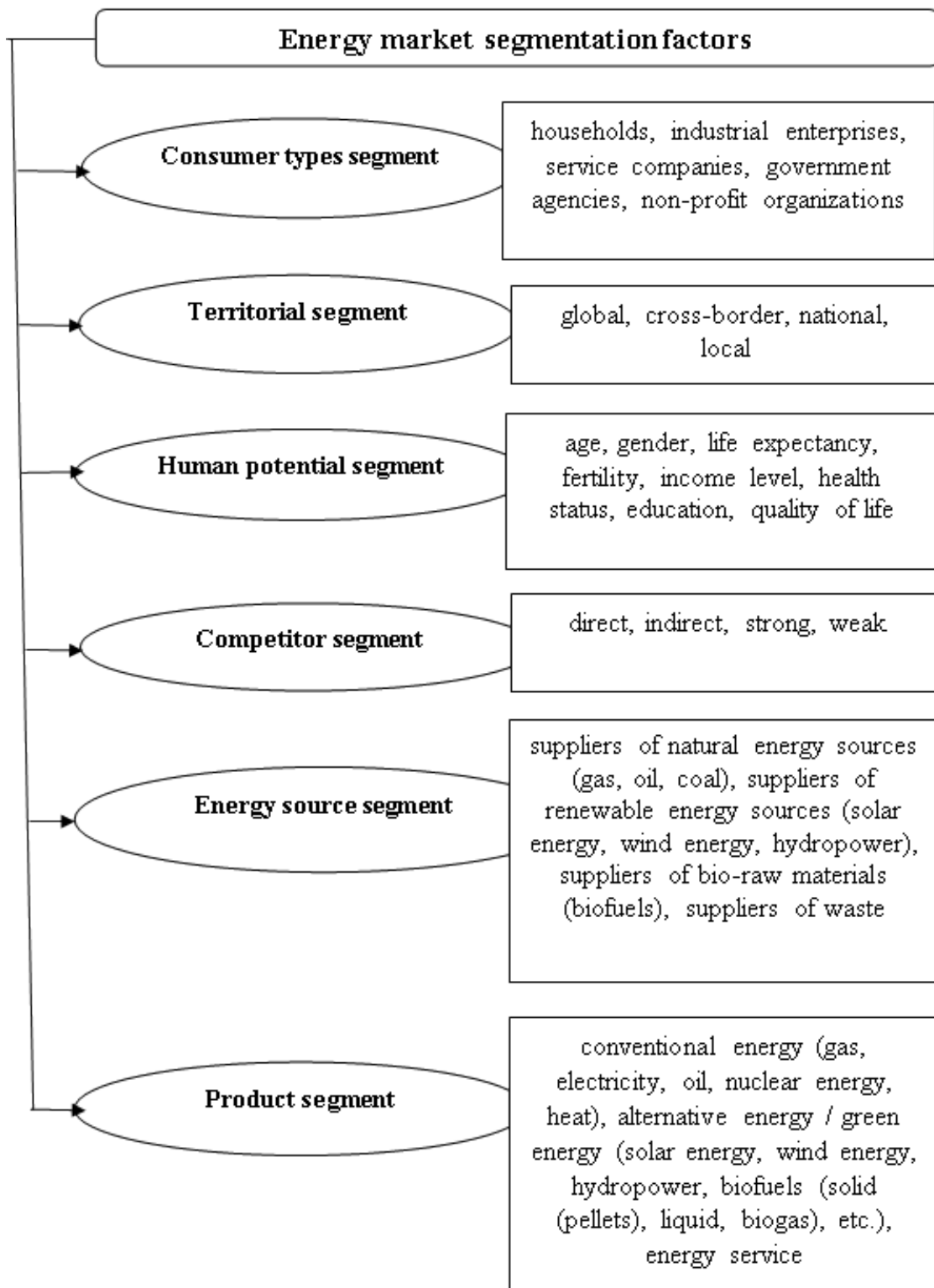


Figure 1 – Segmentation of the energy market by factors

Source: authoring

The bioenergy market (market for biofuels, bioenergy products) is a part of the energy market based on alternative energy sources and has the following structure: the market for generating capacities (biomass energy, biofuel), the market for heating and cooling systems based on biomass combustion, the market for transport fuels (biodiesel, bioethanol). In addition, the geography of solar energy consumption is being expanded. Solar energy belongs to renewable energy sources and is



characterized by a low cost of the production process, which leads to a quick payback of the installing cost of solar power plants (solar panels).

The energy services market is a system of organizational and economic relations regarding the production and consumption of energy services between suppliers and consumers. The subjects of the energy services market are customers (firms, government agencies, households) from the side of the demand for energy services, and energy service companies (ESCO) from the side of the supply of energy services, which are provided the following services: installation of equipment and its commissioning, services in the field of energy saving and energy efficiency; energy consulting; information and diagnostic services; engineering; personnel training; repair, modernization and reconstruction of power facilities; equipment maintenance) [16].

At the same time, this testifies the application of innovative approaches to energy services, as they are based on taking into account the diversification of renewable energy sources, the digitalization of business processes, the introduction of smart grids [17] aimed at strengthening the competitiveness of an energy service company on the market by positioning quality services that provided by the company.

Conclusions.

Climate change, limited natural energy sources have led to the transformation of the energy market mechanism in the direction of achieving sustainable development goals. The creation of a competitive environment in such a market is accompanied by the strengthening of the diversification policy of green energy obtaining sources. Taking this into account, this type of energy is considered to be an innovative product in the energy market, causing qualitative and quantitative positive changes in strengthening environmental and energy security.

In particular, the use of an integrated segment approach to defining the green energy positioning as an innovative product in the energy market made it possible to single out the components of the mechanism for the innovative development of this market. Taking this into account, a promising direction for further research is the development of a strategy for managing the product policy of green energy producers.

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Анотація. Стаття присвячена визначенню факторів позиціонування “зеленої” енергетики як кліматично-нейтрального товару на енергетичному ринку на основі сегментації. Аналіз факторів формування сегменту “зеленої” енергетики на енергетичному ринку дозволив встановити глобальну тенденцію до зниження попиту на такі види енергії, як газ, нафта, вугілля, атомна енергетика. Але, враховуючи загальну тенденцію зниження попиту на електроенергію, виявлено позитивну динаміку споживання “зеленої” електроенергії, отриманої з альтернативних джерел енергії. Для оцінки рівня взаємодії сегменту “зеленої” енергії з іншими сегментами енергоринку було проведено сегментацію енергетичного ринку за факторами. Результатом такої сегментації стало визначення напрямів розвитку енергетичного ринку на основі використання та споживання енергії з природних невідновлюваних джерел, виробництва та споживання альтернативної енергії (“зеленої” енергії), а також надання енергетичних послуг.

Ключові слова: зміна клімату, відновлювані джерела енергії, сталий розвиток, альтернативна енергетика, енергетична та екологічна безпека, сегменти ринку.

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