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INNOVATIVE CONTROL MECHANISM OF THE FUEL AND ENERGY COMPLEX OF UKRAINE

The purpose of this research is to analyze the problem of the fuel and energy complex of Ukraine, as its condition has influence on the successful development of all sectors of the Ukrainian economy and the standard of living in Ukraine. Over the past few years the domestic energy has faced with a number of challenges, which require effective and rapid solutions to be managed. In this case, we are proposing innovative control mechanism of the fuel and energy complex of Ukraine, which could become a major source of economic growth, especially in the context of the modern paradigm of sustainable development and natural resource scarcity.

Keywords: fuel and energy complex, FEC, innovative mechanism, alternative energy sources, energy intensity, energy potential, biomass, GDP, resource saving technologies, modernization.

Артьомова А.Ю., Меденцева М.М., Хлестова О.О. ІННОВАЦІЙНИЙ МЕХАНІЗМ УПРАВЛІННЯ ПАЛИВНО-ЕНЕРГЕТИЧНИМ КОМПЛЕКСОМ УКРАЇНИ

У даній статті розглянуто проблеми паливно-енергетичного комплексу України, оскільки від його стану залежить успішний розвиток всіх галузей народного господарства і, відповідно, рівень життя населення. Протягом останніх років у вітчизняній енергетиці накопичилося чимало складних проблем, які вимагають ефективного і швидкого вирішення. У зв'язку з цим запропоновано інноваційний механізм управління паливно-енергетичним комплексом України, який може стати головним джерелом економічного зростання, особливо в контексті сучасної парадигми сталого розвитку та обмеженості природних ресурсів.

Ключові слова: топливно-енергетичний комплекс, ПЕК, інноваційний механізм, альтернативні джерела енергії, енергоємність, енергетичний потенціал, біомаса, ВВП, ресурсозберігаючі технології, модернізація.

Артемова А.Ю., Меденцева М.М., Хлестова Е.А. ИННОВАЦИОННЫЙ МЕХАНИЗМ УПРАВЛЕНИЯ ТОПЛИВНО-ЭНЕРГЕТИЧЕСКИМ КОМПЛЕКСОМ УКРАИНЫ

В данной статье рассмотрены проблемы топливно-энергетического комплекса Украины, поскольку от его состояния зависит успешное развитие всех отраслей народного хозяйства и, соответственно, уровень жизни населения. На протяжении последних лет в отечественной энергетике накопилось немало сложных проблем, которые требуют эффективного и быстрого решения. В связи с этим предложен инновационный механизм управления топливно-энергетическим комплексом Украины, который может стать главным источником экономического роста, особенно в контексте современной парадигмы устойчивого развития и ограниченности природных ресурсов.

Ключевые слова: топливно-энергетический комплекс, ТЭК, инновационный механизм, альтернативные источники энергии, энергоёмкость, энергетический потенциал, биомасса, ВВП, ресурсосберегающие технологии, модернизация.

Problem definition. The key for the state prosperity and one of the most important structural components of the economy of many countries, including Ukraine, is the fuel and energy complex (FEC). Despite the significant natural resources of coal, high reserve capacity for the production of electricity and fuel Ukrainian Energy today is stagnating, and it does not allow the economy to ensure stable fuel and energy resources at competitive prices and puts it in a substantial dependence on exports. Innovation processes could be the main source of economic growth, particularly in the context of the modern paradigm of sustainable development, and limited natural resources (including energy).

This situation is caused by:

1) high cost of energy, a significant moral and physical depreciation of fixed assets (about 80% of the assets of coal mines and power plants, 60% of the electricity distribution companies are completely depreciated);

2) lack of public financial resources and industry unattractiveness for private investment;

3) low efficiency of electricity generation and transmission (energy consumption in Ukraine is 35% higher, and the level of losses in transmission is twice higher than in Europe) [1];

4) critical financial and economic situation of the

majority of enterprises of mining, smelting, refining and fuel consumption, production, transmission and use of electricity and heating;

5) lack of a competitive market for coal;

6) lack of transparency and inconsistent regulatory policy;

7) high cost of fuel and energy resources.

Analysis of recent research and publications. In the Ukrainian science school these problems are the first on the agenda to be solved, the evidence for this is a number of research papers on the need for system management and the formation of long-term strategic development programs FEC. In this sense we can distinguish the works of such scientists: N.I. Voropai, M.H. Ibragimov, I.A. Bashmakova, V.V. Litvak, V.G. Semenov, V.A. Stennikova, G.V. Agafonova, I.Y. Ivanov, A.D. Sokolova, B.G. Saneeva, M.P. Malahini, E.N. Bizyarkina and several others, whose researches are based on the analysis of foreign and domestic experience, as well as the situation Ukrainian energy sector to create a theoretical and methodological basis for the development strategy of the fuel and energy complex of Ukraine. It should also be noted that there is a growing number of discussions about choosing the best ways of FEC development in the future. The subject of analysis and discussions is the innovative mechanism for devel-

opment of FEC. However, this is not enough theoretical and applied research aimed at developing efficient tools and techniques of the transition to an innovative model of development [2].

The main material. Statistics shows that the Ukrainian economy is one of the most energy intensive in the world: for production of 1 unit of GDP is spent 3-5 times more energy than in Eastern Europe. This fact causes an increase of costs in the state budget because of the need to subsidize purchases of the «excess» amount of energy resources, including gas and increase pollution that creates problems for the competitiveness of the economy in the future, as the inevitable alignment of domestic electricity prices with the world ones [2].

Energy intensity of GDP (operational data for 2013) in our country is now 0,613 kilograms of fuel equivalent to UAH output. The diagram in Figure 1 shows that ten years ago it was 0.82 pounds, five years ago – 0,635 in 2012 – 0,621 kilograms of fuel equivalent products on the 1 UAH [3]. Beginning in 2009, the dynamics of energy efficiency has deteriorated, but still retained the movement, though it goes not as fast as we would like.

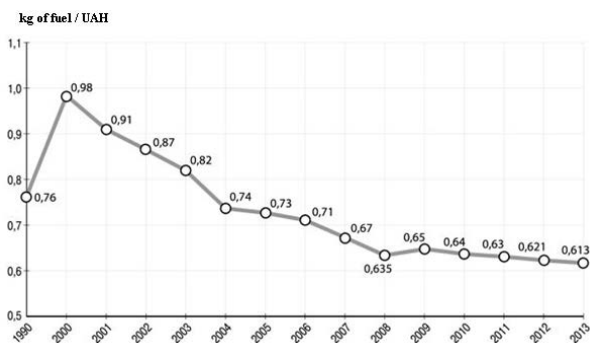


Figure 1. The energy intensity of GDP Ukraine, EF kg. / UAH

However, world stocks of fuel resources are constantly decreasing, so Ukraine to include alternative energy sources in the fuel balance. Ukraine is the decentralization of investment and innovation process. State puts these obligations on business entities. In this way lending dominates under direct financing [4].

In most countries, major energy companies are involved in development of alternative energy processes. They are engaged in the implementation of major investment projects in the alternative energy sector, finance, research and development in this field. However, Ukrainian energy companies do not show an interest in the development of Ukrainian alternative energy [5].

Since the beginning of implementation in Ukraine the «green» tariff in the development of alternative energy sector has been changing. Implemented major energy projects based on alternative, renewable energy sources in Ukraine. Solar and wind power plants are built and successfully operated, and their number is planned to be increased. [6]. However, the development of renewable energy in the country is at the initial level. Their share is only 0.5 % of the total energy potential [7].

Analyzing the European experience of innovative development of FEC, we can see that the energy strategy of the European Union provides two key points: energy saving and increase the share of renewable energy in the energy sector (20%). In Ukraine there is the opposite trend: energy consumption in 2030 will

increase by 51%, while the share of «green» energy will be only 4%. The state relies on the peaceful atom, which is even more dangerous, but more productive [8]. The threat of ecological disaster in this case is very high, even taking into account all the safety measures. For example, Germany has decided to abandon all nuclear energy and switch to renewable energy sources.

There are many opportunities for innovative alternative energy development in Ukraine in areas such as wind power, solar energy, geothermal energy, fuel and non-traditional energy combined systems [9].

Talking about the wind energy the speed of wind should reach from 5 to 10 m / sec for 60% of days annually. These conditions are satisfied in Ukraine territory areas such as: Black Sea region, Mykolayiv and Kherson, Donbass, Polesse, mountainous areas of the Crimea and the Carpathians [9]. But apart from industrial wind power, which can be applied to small towns and cities, today is the use of small wind power in residential homes is more effective [1].

Furthermore, Ukraine has the ability to provide growth of knowledge-intensive, high-tech products through extensive innovation, environmentally friendly and resource-saving technologies, based largely on its own scientific and technical and human resources, the ability of the domestic industry, deepening its cooperation with industry of other countries on the development of joint enterprises with foreign investors [2].

Metallurgy and precision engineering of Ukraine can make a significant contribution to the innovative development of these technologies and capture this important part of the market that is developing dynamically [7].

Ukraine also has opportunities in renewable fuels. According to the State Statistics Committee of Ukraine in the agricultural sector the potential of accumulated biomass energy is estimated at more than 7.5 million tons of fuel/Year. The energy potential of biomass could meet 10% of total energy demand in Ukraine. But now these features are not used at all [4]. Due to the fact that oil prices are rising in the world, the development of the alternative fuel sphere is very important for Ukraine. Ukraine has a clean and environmentally friendly energy sources: solar, wind, water, biomass, agricultural waste and coal methane. Now they are not only attractive resources but also an attractive long-term investment.

Investing in innovation of these resources will allow the state to increase its energy independence, as well as earning a profit even in the beginning of stimulating the development of FEC technology [8].

Findings of our study and the prospects for further development of the topic. Results of the study identified the following trends:

1) the only way to provide progressive development of domestic industrial and agricultural products is the successful modernization of the energy sector;

2) development of the fuel and energy complex should be balanced and aimed at meeting the needs of the national economy and population, ensuring a reliable energy supply of the country;

3) it is important to have additional fuel resources to increase exports.

To maximize the benefits of FEC development, we need to determine the mechanisms of the reconstruction of thermal power plants to adapt their equipment to work on low-grade coal, developed by our scientists, to introduce the latest technology that would allow the successful operation of boilers due to domestic fuel base or alternative energy sources. This will

not only provide real energy independence, but also to open the prospects for solving the complex problems of the Ukrainian economy – the development of the coal industry. And what is very important to provide the full load capacity of domestic engineering, ferrous and non-ferrous metallurgy, chemical industry, instrumentation and construction industry.

In this way, despite the recognition of the necessity of the innovative development of Ukraine economy in general and energy in particular, it's not popular in Ukraine. Although a lot of reasons for this are related to the general poverty of the state and low economic development, not completed market reform, insufficient level of privatization and some other objective factors, there are also significant opportunities to promote this innovative way of development. Current political and economic situation could negatively affect the FEC of Ukraine (and Europe as a whole), because of the dependence of the European countries on Russian gas. AT the first quarter of 2014 Ukraine bought fuel from Russia at 268.5 dollars per thousand cubic meters. Since April, the discount provided to Kiev at the end of last year, is no longer valid; then the price of gas will rise. Europe used to face with unplanned interruptions in gas supplies, when Moscow and Kiev had failed to agree on the price of Russian gas supplies to Ukraine. However, due to warm winter in Europe, gas reserves are at a high level, these reserves will weaken the impact of any potential disruption of supplies. According to the organization Gas Infrastructure Europe – a lobby group in Brussels pipeline operators, gas storage facilities located in 28 countries of the European Union, March 2, 2014 are filled at 49%, while a year earlier figure was only 37%. According to Bloomberg analyst Sanford C. Bernstein & Co. Oswald Clint, these reserves are equivalent to the amount of gas supplied to Europe through Ukraine for six weeks [10].

Therefore, in our opinion, in the near future in the energy industry needs:

- 1) to define the sectoral priorities clearly;
- 2) to develop and begin to implement national, sectoral and cross-sectoral, regional innovation programs;
- 3) to establish sectoral and regional information centers of innovative projects in the energy sector;
- 4) to extend the formation and involvement of various sources of financing innovation programs FEC in Ukraine.

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