

JEL Classification: Q 21; Q 41; Q 48; L 44

UDC 338.23:620.9

DOI: 10.30857/2415-3206.2019.1.6

GROUNDS FOR SELECTION OF THE ENERGY MARKET GOVERNMENT REGULATION TOOL

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Introduction. World experience has shown that the high energy intensity of the economy coupled with the scarcity of its own energy base causes many problems of low competitiveness of the country. The use of an effective model of state regulation of energy consumption allows us to form an effective energy saving strategy, to intensify the processes of updating the fixed assets with high-tech energy-saving equipment and technologies.

Hypothesis: the lack of a universal approach to building a system of state regulation of the energy market requires focusing on individual methods and directions of implementing energy conservation policies.

The purpose of the study is to substantiate and develop practical recommendations for implementing an effective policy of state regulation of the energy market.

Methods of research: historical and logical – in the study of patterns of development of scientific thought about the role of the state in regulating the energy resources market; statistical and factor analysis – for revealing of

macroeconomic factors of influence on the market of energy resources; economic and mathematical modeling – in developing the model of functioning of the energy market.

Results: features of the use of modern instruments of state regulation of energy resources are analyzed. The model of functioning of the energy resources market, the introduction of which will contribute to the formation of a highly competitive environment of generating companies, transferring organizations, intermediaries, and a high level of competition, is proposed.

Conclusions: state regulation of the energy resources market is an activity on the state functions in relation to the rational use of energy resources, reducing the energy intensity of the gross domestic product. Formation of effective instruments of state regulation of the energy resources market will improve the functioning of the energy sector of the Ukrainian economy.

Keywords: state regulation; energy market; energy consumption; energy saving policy; model of functioning of the energy market.

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**ОБҐРУНТУВАННЯ
ІНСТРУМЕНТАРІЮ
РЕГУЛЮВАННЯ
ЕНЕРГОРЕСУРСІВ** **ВИБОРУ
ДЕРЖАВНОГО
РИНКУ**

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Вступ. Світовий досвід довів, що висока енергомiсткiсть економiки в поєднаннi з дефiцитнiстю власної енергетичної бази спричиняє численнi проблеми низької конкурентоспроможностi країни. Використання ефективної моделi державного регулювання енергоспоживання дозволяє сформувану ефективну стратегiю енергозбереження, активiзувати процеси оновлення основних засобiв високотехнологiчним енергозберiгаючим обладнанням i технологiями.

Гiпотеза: вiдсутнiсть унiверсального пiдходу до побудови системи державного регулювання ринку енергоресурсiв вимагає зосередження на окремих методах i напрямках реалiзацiї полiтики енергозбереження.

Мета дослідження полягає в обґрунтування та розробцi практичних рекомендацiй щодо здiйснення ефективної полiтики державного регулювання ринку енергоресурсiв.

Методи дослідження: iсторико-логiчний – при дослiдженнi закономірностей розвитку наукової думки щодо ролi держави в регулюваннi ринку енергоресурсiв; статистичного та факторного аналізу – для виявлення макроекономiчних факто-

рiв впливу на ринок енергоресурсiв; економiко-математичного моделювання – при розробцi моделi функцiонування ринку енергоресурсiв.

Результати: проаналiзовано особливостi використання сучасних iнструментiв державного регулювання ринку енергоресурсiв. Запропоновано модель функцiонування ринку енергоресурсiв, впровадження якої сприятиме формуванню висококонкурентного середовища генеруючих компанiй, передавальних органiзацiй, посередникiв, високий рiвень конкуренцiї.

Висновки: державне регулювання ринку енергоресурсiв представляє собою дiяльнiсть з реалiзацiї функцiй держави щодо рацiонального використання енергоресурсiв, зниження енергоємностi валового внутрiшнього продукту. Формування ефективних iнструментiв державного регулювання ринку енергоресурсiв дозволить полiпшити функцiонування енергетичного сектору економiки України.

Ключові слова: державне регулювання; ринок енергоресурсiв; споживання енергiї; полiтика енергозбереження; модель функцiонування ринку енергоресурсiв.

Formulation of the problem. Energy resources play an important role in the development of the economies of the world. The current stage of development of the domestic energy market is characterized by the influence of external and internal factors, which are caused by the slowdown in the development of the world economy, the spatial discreteness of the distribution of energy resources, the violation of their balanced production and consumption, the aggravation of environmental problems, and globalization.

The main drawbacks of the Ukrainian energy market are the lack of diversification of sources of energy products supply; significant technogenic load on the environment; unsatisfactory technical state of a part of energy objects, including systems of transportation of energy products [1]; high level of energy intensity of the national economy; low energy efficiency. Today, the process of providing energy resources is pre-crisis, requiring state regulation, given the significance of this issue for the country's economy. Own energy recovery does not meet the needs of Ukraine, as evidenced by the lack of its own energy resources, the growing demand for them and high energy prices. The foregoing determines the need to study issues related to improving the efficiency of state regulation of the energy market in Ukraine

An analysis of recent research and an unsolved part of the problem. In the economic literature recently there is an increase in publications, which deals with state regulation in the energy sector. But most authors devote insufficient attention to the main instruments of state regulation, through which the process of managing the energy industry is carried out. It should be noted that a market economy requires state regulation and implementation of organizational mechanisms that ensure the unification of economic entities of the country into a coherent system.

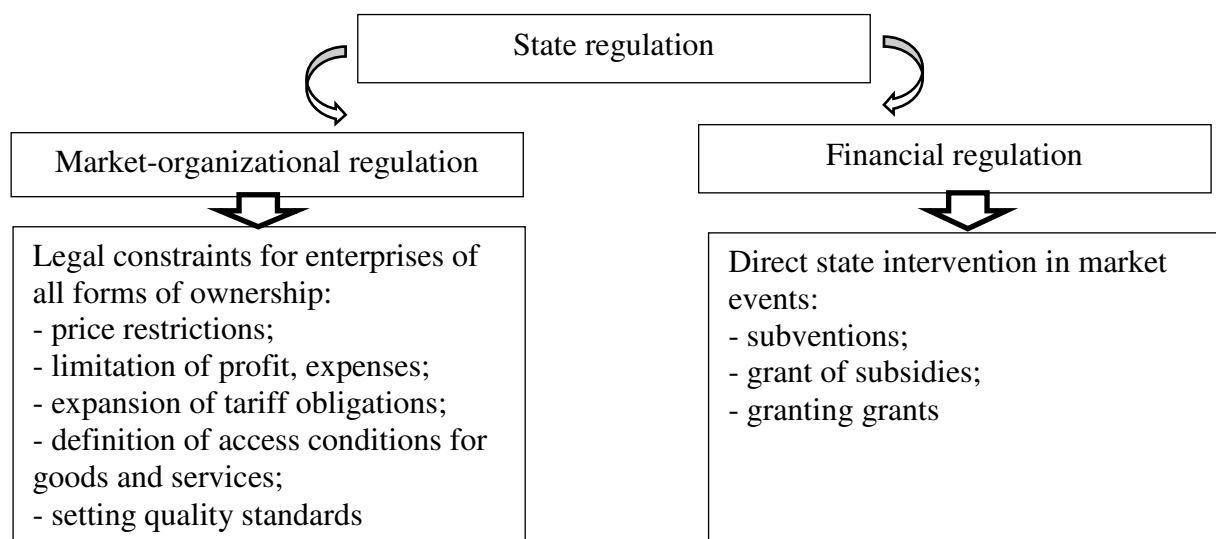
Issues devoted to the formation of the energy market, to increase the efficiency of the use of its various types, including alternative sources, were considered in the scientific works of domestic and foreign scientists: S. Fisher [2], O. Geden [2], B. Box [3], B. Slupsky [3] and others. Problems of state regulation of the fuel and energy complex are considered by such scholars as L.S. Belyaev [4], N.V. Mitsa [5], L.L. Tovazhnyansky [6], I.A. Franchuk [7], B. Shevchenko [6]. Conceptual bases of management and regulation of the development of the fuel and energy complex are highlighted in the works of foreign and domestic scientists: O. Alimov [8], A. Danilenko [8], V. Tregobchuk [8], V. Bakumenko [9], V. Knyazev [9], Yu. Surmin [9], I. Galyuk [10], O. Matskevich [10].

At the same time, the issues related to the formulation of recommendations for ensuring the efficiency of the process of regulating the energy market in Ukraine remain insufficiently researched.

The purpose of the article is to study and determine the most effective tools for state regulation of energy resources.

Research results. Taking into account the foreign experience of state regulation of the energy sector, based on the principles of transparency and responsible management, an important task of state policy is the formation of an effective and understandable mechanism for regulating the country's energy sector. Particular attention is paid to the search for instruments of state regulation of the energy resources market, which can provide qualitative transformations in the energy sector and the economy as a whole. Today it can be argued that state regulation and its tools are not sufficiently effective to improve the state of the energy sector. These tools need to be improved. There is a constant transformation of elements of the structure of state regulation and its permanent changes, redistribution of functions between state bodies, search of more effective instruments and mechanisms of state regulatory policy.

Instruments of state regulation of the energy resources market are mechanisms and institutions, through which the national economy carries out regulatory activity aimed at the development of the industry, the allocation of resources and the formation of proportions of industry development. It should be noted that, depending on the task solved by the state, and the forms of its intervention in the economy, state regulation is divided according to directions, as shown in Figure 1.



Source: [3; 5; 7; 9].

Figure 1. Division of state regulation depending on the task and forms of state interference in the economy

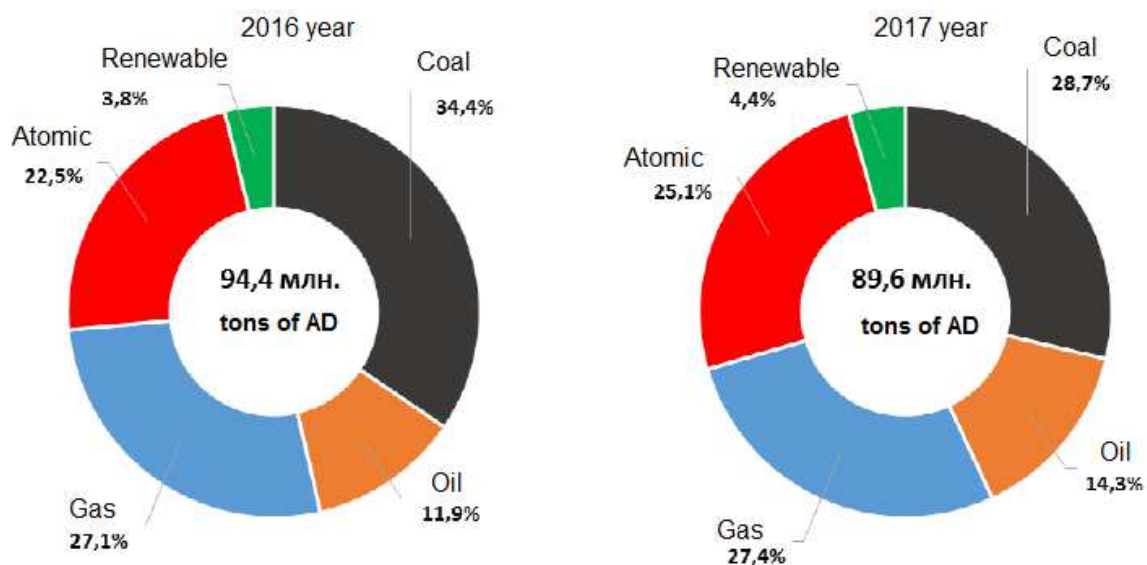
Today, the Ukrainian fuel and energy complex (FEC) is in a pre-crisis condition, which is confirmed by a number of problems, first of all, with imperfect state regulation and non-compliance of executive authorities with

existing state policy measures. Taking into account the inability of the state to act on the processes of functioning in the energy sector of Ukraine without an organized process of solving the set tasks, the organizational provision of state regulation of the energy sector is an important component of the efficient functioning of the entire industry of the country.

Among the wide range of urgent problems of brutal state policy, the following areas of the energy industry are in demand, which have absolutely concrete problems and which are shown insufficiently and unstructured, namely:

- instability of the situation in the energy market due to high monopolization of imports of natural gas and oil and, consequently, high prices for them;
- growth of energy consumption of products;
- unsatisfactory and emergency condition of the overwhelming part of fixed assets, depreciation of production assets of the fuel and energy complex;
- excessive consumption and inefficient use of energy resources;
- insufficiency of investments in the energy sector, which is combined with the crisis state of non-payment, makes it impossible for its stable work and development;
- lack of promising energy policy.

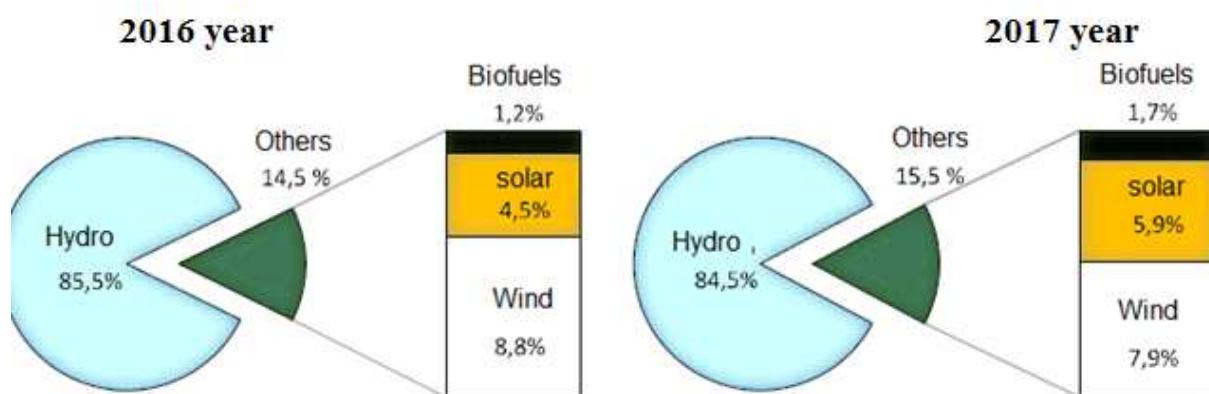
Thus, on the basis of these problems, we will try to understand more in the state of power supply and analyze the peculiarities of these negative processes that take place in the energy market. In the energy balance of the country in 2017, the total supply of primary energy amounted to 89.6 million tons of oil equivalent (million tons of oil), which is 5.0% less than in 2016 (Figure 2).



Source [11; 12].

Figure 2. Distribution of energy sources in the total supply of primary energy (by main types of fuel and energy)

In 2017, primary energy production amounted to 58.9 million tons, which is by 11.3% less than in 2016. In the structure of own production, the largest share was: atomic energy – 38.2%, natural gas – 26.3% and coal – 23.2%, renewable energy (RES) – 7.7%. Own production provided 65.7% of the total primary energy supply. The structure of own production of primary energy is characterized by the following changes: the shares of atomic energy, natural gas and RES increased by 6.1 percentage points, 3.4 pp and 1.5 pc respectively, while simultaneously reducing the share of coal by 11.3 pp. Fossil energy resources accounted for 53.2% of total energy production. In the RES structure in 2017 the bulk of biofuels and wastes accounted for 79.8%. In the structure of electricity production, the largest share of renewable energy sources remains hydropower. However, in 2017, the share of hydropower and wind energy decreased by 1.0 pp and 0.9 pp respectively, with simultaneous increase of solar energy particles by 1.4 pp and biofuels by 0.5 pp (Figure 3).



Source: [11; 12].

Figure 3. The structure of electricity production from renewable energy sources

Net imports (the difference between imports and exports) of primary energy in 2017 amounted to 33.2 million tons and it increased by 20.2% year-on-year, mainly due to the growth of imports of natural gas and coal. In the structure of energy imports, the share of coal was the largest and constituted 36.8%, natural gas – 31.9%, crude oil and petroleum products – 31.2%. In the structure of energy exports 29.2% of the volumes were coal, 27.9% – biofuels and 23.1% – electricity.

The final consumption sector represents primary and secondary energy and fuels used by consumers. In the final consumption of fuel and energy in 2017, 50.1 million tons of energy was used, which is 3.0% less than in 2016. The decrease in the volume of final energy consumption was mainly due to the reduction of coal use, natural gas and heat. In the structure of final consumption among the main sources of energy the share of natural gas remains the largest

(29.9%), the share of electricity was 20.2%, crude oil and petroleum products – 20.1% (Table 1).

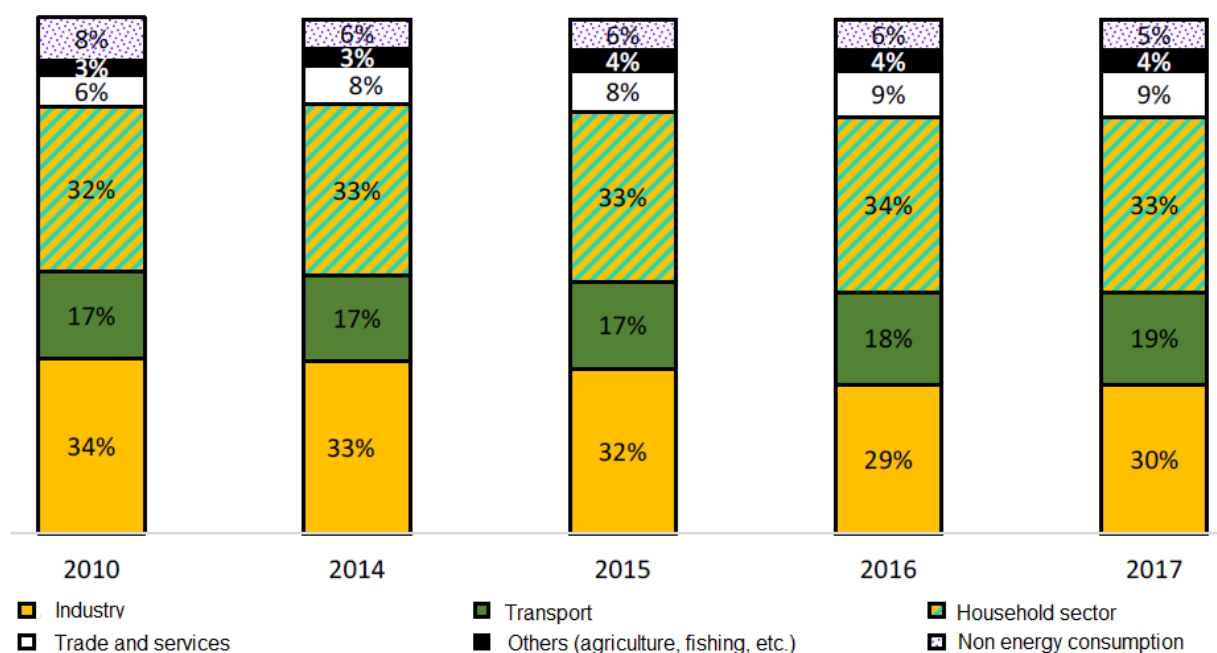
Table 1

The structure of final energy consumption

Year	Final energy consumption, ths tons of asc.	By volume of final consumption, %					
		natural gas	coal and peat	crude oil and petroleum products	electric power	heat energy	biofuels and waste
2017	50086	29.9	10.4	20.1	20.2	15.6	3.8
2016	51649	30.3	12.2	18.7	19.6	15.9	3.3
2015	50831	31.5	12.4	18.6	20.1	14.8	2.5
2014	61460	34.1	14.9	16.5	18.0	14.5	2.0
2010	74004	38.4	11.3	16.5	15.6	16.9	1.3

Source: [11; 12].

The largest final consumers of fuel and energy in 2017 were the domestic sector and industry, which accounted for 32.8% and 30.2% respectively (Figure 4).



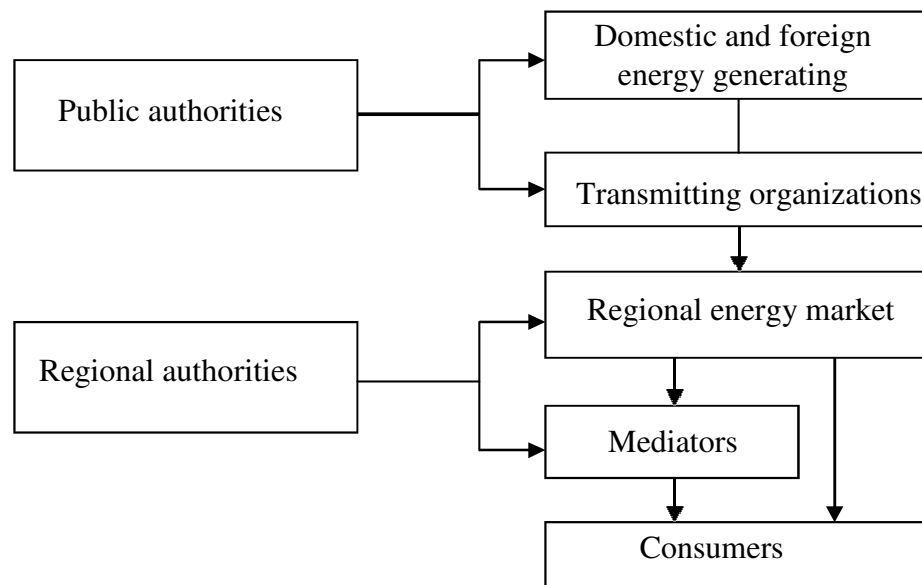
Source: [11; 12].

Figure 4. The structure of final consumption in directions

Non-energy consumption in 2017 amounted to 2.5 million tons, from which 1.2 million tons of oilseed was used as raw material for industry.

The given data testify that the modern organizational-institutional structure of the energy market does not allow to fully use the complex of incentives of

economic entities to energy efficiency and does not ensure the efficiency of the regulation process and may be reflected by the proposed model of functioning of the energy resources market (Figure 5).



Source: author development.

Figure 6. Model of functioning of the energy market

In our opinion, the national energy market should consist of regional ones that are basic. The interests of the state are to ensure the effective realization of economic, environmental and social functions. In this case, the economic function is manifested in the growth of tax revenues in the budgets, the prevention of monopoly and unfair competition, and the stimulation of energy production at the expense of alternative sources. Some aspects of the implementation of this function are disclosed in [12].

The ecological function is mainly related to compliance with environmental legislation. It is advisable to agree with [3] that the task of public authorities is also to work on the need to ensure an optimal structure of generating capacity with the timely commissioning of new facilities. This is due to the fact that the elimination of energy shortages requires a certain amount of time. The purpose of regulating the influence of public authorities is to prevent a deficit and, in the absence of the necessary amount of private investment, to ensure timely and optimal development of power facilities. Bodies of regional power, to a greater extent, are responsible for the implementation of social functions, since they are close to the specific consumer. Its essence is to reduce the level of social tension, support the strata of the population who are below the poverty line, and so on.

Implementation of the proposed model of functioning of the energy market will contribute to the formation of a highly competitive environment for

generating companies, transferring organizations, and intermediaries. In our opinion, a high level of competition will be ensured by free access to this market of business entities and the use of methods of price and non-price competition, the presence of contracts directly with consumers (their associations).

Some aspects of this model are discussed in [3]. Transmitters are obliged to freely, for a certain fee (rent payments), provide distribution networks for the implementation of energy, directly to consumers or intermediaries.

The operation of this model is economically beneficial to consumers, since it allows you to choose a supplier. Receiving super-profits by power generating companies is limited by competition between them.

At the same time, this model creates prerequisites for implementing energy efficiency programs both for producers (will reduce the cost of energy) and for consumers (reducing the cost of payment).

In our opinion, the main principles of state policy in the energy market should be as follows:

- formation of the legal and institutional environment;
- regulation of the activities of market entities on the basis of the use of economic, regulatory and technical and other methods;
- realization of a complex of measures on the use of tangible and intangible incentives for the rational use of fuel and energy resources;
- Mandatory State Examination [13];
- creation of conditions for the universal use of fuel and energy resource consumption accounting systems.

Solving these problems requires nationwide systemic solutions aimed at improving the instruments of state regulation of the energy market. As primary goals in the field of state regulation of the energy market, the goals related to the reform of the energy complex in the context of the introduction of market relations in the Ukrainian economy through the restructuring of the industry, the development of antitrust laws, the creation of a competitive market for ERFs, and strengthening the requirements of environmental legislation can be distinguished. All this requires accelerated modernization of power facilities, as well as ensuring national security taking into account the energy factor.

The most significant for Ukraine is the comprehension of economic mechanisms of the state's influence on the energy resources market, using a number of state regulation instruments. These include the tools shown in Table 2.

Thus, state regulation of the energy market should be based on the system of economic mechanisms of state energy policy. This system, which includes tax, price instruments, investment rules, provides:

- the transition from fiscal to stimulating taxation in the energy sector;

- attraction of investments into the energy sector on the basis of agreements on the distribution of energy products, resulting in an order in the adjacent industries of industrial production;

- elimination of price imbalances for certain types of energy resources, formation of environmental rent for gas, which is redistributed in favor of other sectors of the fuel and energy complex in connection with the reduction of state subsidies;

- containment of energy prices with the provision of the necessary self-sustainability of ERFs as the basis for the development of heavy industry sectors, which contributes to maintaining the necessary parity of energy prices, industrial products, consumer goods and services, taking into account the population's solvent demand.

Table 2

Instruments of state regulation of the energy resources market of Ukraine

State regulation tool	Characteristic	Task	Expected result
Pricing in the world energy markets (balancing)	A high level of monopoly in the fuel and energy complex of Ukraine, which is increasing from external natural gas supplies	Prevention of unreasonable overestimation of prices and tariffs for fuel and energy, preventing cross-subsidization of some activities in the energy sector at the expense of others	Supply of energy at a regulated tariff
Regulation by licensing	Obliges subjects to adhere to certain conditions and rules of activity	Development of licensing conditions and control over their compliance	Influence on the behavior of the licensee, which allows them to comply with technical, economic and other requirements
Tax regulation	They are used for the operational regulation of the production structure and consumption of PE	Execution of fiscal functions and creation of tasks for efficient functioning and development of the energy sector	Increasing the competitiveness of enterprises, stimulating energy saving, investment and innovation activities of economic entities
Customs regulation	Operational regulation of the structure of import of PER	Regulation of the import structure of the PER	Stimulating the import of scarce resources for Ukraine, restricting imports of goods, the production of which is possible at domestic enterprises (oil refining, coal)

End of Table 2

State regulation tool	Characteristic	Task	Expected result
Strategic state programs	They are created with the purpose of improving the overall energy situation of the country, the effective use of ERF and scientific, technical and economic potential	Formation and implementation of state energy sector development programs	Creation of effective strategic programs, in the process of implementation of which the normal state of the energy industry is achieved and its development
Legislative regulation	Monopolized nature of markets	Implementation of state control over observance of the legislation; regulation of prices (tariffs) for PPs, which are produced (sold) by subjects of natural monopolies; promotion of fair competition	Strengthening the legal field in the context of antimonopoly legislation; regulation and licensing of fuel and energy enterprises
Investment Policy	Carried out in order to improve the investment climate in the country	Expansion of forms of attracting foreign investments into the energy sector	Providing communication between strategic and tactical decisions in the field of investments, the purpose of which is structural restructuring of the power industry

Source: compiled by the authors on the materials [3; 5; 7; 8].

Conclusions and suggestions. Ukrainian energy needs a strategic state policy, based on which it is necessary to put instruments of state regulation of the energy market, which requires the improvement and implementation of certain methods, mechanisms and control over compliance with this energy public policy, due to clear objectives and regulatory measures. The most important tasks are to ensure stable energy supply, develop extraction (production) of FERs, increase energy efficiency and modernize and automate power plants and FPC facilities, which will contribute to strengthening the energy security of the state. This can be achieved by creating market conditions in the energy sector, which requires a change in pricing policy, restructuring of energy companies, improvement of management, the development of competitive markets, attracting foreign investment.

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