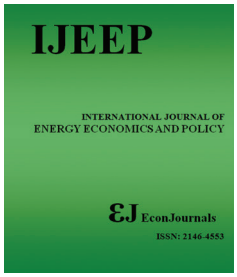

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Methodology of the Process of Improving the Support Tools for Fuel and Energy Complex Within the Context of Achieving Energy Efficiency and Energy Independence of the Region

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ABSTRACT

This work is a continuation of a series of authors' publications in the framework of a study of tools for supporting the fuel and energy complex in the context of achieving energy efficiency and energy independence of the regions. In this paper, the definition of the term "state support of the fuel and energy complex" was formulated, an analysis of state programs for supporting federal and regional levels in the fuel and energy complex was made. A consistent methodological scheme has been developed for organizing the process of improving the instruments for supporting the fuel and energy complex of the region, according to the specifics of the development of the fuel and energy complex and its role in the region's economy.

Keywords: Instruments of Fuel and Energy Complex Support, Regional Fuel and Energy complex, Energy Efficiency, Energy Independence of Regions
JEL Classifications: O13

1. INTRODUCTION

The current state of the fuel and energy sector is formed under the influence of many global trends, such as the development of technologies, ecologically achieving energy independence, resource regionalization, and population dynamics. On the other hand, a high degree of unpredictability and volatility, as well as the existence of a cyclical economic development, intensifies the non-stationary nature of the economic regime in the country. In such conditions, it is necessary to form new methodological approaches and effective tools to achieve the targeted indicators of the fuel and energy complex in terms of energy efficiency and energy independence (Chernyaev, 2014).

The interaction of business, state and society in the fuel and energy sector, as in no other industry, is based on mutual interests, which stimulates the application of an integrated approach, the basis of which is embedded in the concept of sustainable development, and which presupposes the organization of activities within not only economic but also social and innovative benchmarks (The official website of American Council for an Energy-Efficient Economy).

Until now, the functioning of the fuel and energy complex in most of the national economies is carried out with state participation. Increasing the efficiency of resource use based on energy efficient technologies and optimizing energy generating capacities is a priority task of the modern fuel and energy complex and needs

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state support (Baidacov and Rogelev, 2002). The world practice of applying state support has developed a large number of instruments and integrated mechanisms that allow to effectively implement the state policy in the fuel and energy sector (The official website of the World Energy Council). In Russia, due to the high degree of resource regionalization, different branch specialization, the problem of forming the adjustment of complex support instruments in every subject of the country is especially acute. The effective use of a government support tool or a set of various tools should be methodologically reasonable and implemented in the context of the state's energy policy (Chernyaev et al., 2017).

And what about energy security? Energy security is a complex concept related to several levels: Political energy security; economic energy security; techno genic energy security (Chiz, 2012; Zerkalov, 2012). In order to achieve energy security, a specific state policy and special events are required. Also, markets can contribute to energy security, but they cannot be the only ones who do this. Achieving energy security requires the joint use of all regulatory mechanisms (Kokoshin, 2006; Zhavoronkova and Shpakovskiy, 2012).

Energy security is associated with the energy independence of the state, its subject or region. The concept of energy security includes tariffs and reserves of energy resources, allowing to solve the tasks. In the minds of ordinary people, energy security appears as a burning light bulb and a warm battery (Bushuev, 2002; Fartov et al., 2007).

Heat supply - a system for providing heat to buildings and structures. One of the key problems of heat supply in the Russian Federation is the reduction in the heat transfer of heating appliances and heat exchangers due to the accumulation of oxides and metal salts (Kuznetsova, 2002).

2. MATERIALS AND METHODS

A systematic approach to the problem being developed, which includes a set of general scientific methods: Analysis, synthesis, induction, deduction, allows us to logically correctly construct cognitive procedures for constructing a methodology for improving the support tools of the fuel and energy complex, whose ultimate goal is targeted targets for energy efficiency and non-volatility in the region. The main methodological foundation of the research is the interdisciplinary approach, the application of which is connected with the convergence of the branch economy, finance, management, engineering and energy. Using the methodological tools of the above sciences and convergence of their cognitive potential will ensure the complexity and universality of the proposed methodology (Vakulko et al., 2001). The contradictory nature of the results of the use of support tools for the fuel and energy complex, the identification of the reasons for the deviations of the indicators to be targeted, and, in some cases, their complete failure to achieve, will form a relatively universal methodology. Relativity will be characterized by features of the stage of development of the state policy of regulation of the fuel and energy complex in the country. The institutional approach made it possible to determine the political and management component that characterizes the stage of development and has a definite impact on the methodology being developed. Under the politico-administrative component, the authors mean the state policy of development of the fuel and energy sector, in the context of which regional energy policy is being developed and implemented. The comparative method used in the work made it possible to compare the general and specific characteristics of the support tools used in the energy sector (Besedina et al., 1992).

3. RESULTS

The development of fuel and energy complex in world practice and in our country is carried out with an indispensable element of "State intervention", and from the point of view of economic theory can be justified by "market failures," meaning that the price of traditional energy goods and services does not take into account the negative effects including, on the environment (Richtlinie des europäischen parlaments und des rates vom 23. April 2009). The positive effect of increasing energy efficiency, which manifests itself in other spheres of the national economy, is a factor of financial economy and improvement of the ecologically of the vital activity of the population. Thus, market mechanisms in the fuel and energy complex do not work to achieve modernization goals and the application of expensive renewable energy technologies (RES), which requires the implementation of plans to achieve energy efficiency and energy independence indicators only with government support (Bushuev, 2011).

The concept of "support" in the normative and legislative acts of the Russian Federation is applied in several contexts: "Support mechanisms" - as an integrated approach to support, which includes improving the regulatory framework and support tools (Decision № 1217-p) "Support tools" - innovative development programs, development institutions, business associations, technology platforms and innovative territorial clusters (Decision № 1217-p), monitoring, analysis, forecast and development planning of the fuel and energy complex (Decision № 321); "Direct support" - implementation of investment projects with state participation (Decision № 1662-p).

The study of normative legal acts makes it possible to formulate the definition of the term "state support in the fuel and energy sector" as "the implementation of measures designed to create special favorable conditions in the economy that promote regional, territorial and national energy efficiency and energy independence caused by the introduction of innovative energy technologies based on RES."

The authors carried out an analysis of the effectiveness of Russian government programs at all levels in the energy sector as support activities. As a result, the quality of such programs was not sufficiently high, both at the federal and regional levels and it is expressed as follows.

Until now there has not been a full-fledged system of strategic documents that would set the current priorities for socio-economic development and the state energy policy of both Russia and individual entities. As practice shows, the adjustment of strategic

documents, first of all - sectoral ones, developed mostly until 2012 in substantially other macroeconomic and foreign policy conditions, is of little effect. It is necessary to develop new documents reflecting modern external conditions and priorities for social and economic development (for example, established by the Presidential Decrees of May 7, 2012). The problem of interrelating strategic planning documents through indicators and their target values is especially acute.

The values of the indicators of the state programs of the regions in the field of energy efficiency and energy development do not allow realizing the achievement of the planned results of the state policy. Difficulties in the coordination of state programs of the RF subject with the state programs of the Russian Federation, including state programs for territorial development, are related to the shortcomings of program structures that do not meet the uniform requirements (approaches) to the program-targeted structuring of federal budget expenditures. Some government programs have subprograms that contain only investment expenditures aimed at achieving the objectives of government programs, supporting other sectors. In state programs, practically, other than federal budget expenditures, instruments for implementing state policy are not considered.

Since 2014, financial support for state programs of the constituent entities of the Russian Federation at the expense of the federal budget is provided by providing a multitude of subsidies to the budgets of the constituent entities of the Russian Federation only if extra-budgetary funds are attracted (The official website of the Federal State Statistics Service of the Russian Federation). At the beginning of 2017, energy efficiency measures were included as sub-programs or separate programs in all regions of the Russian Federation. In 48 regions, independent programs in the field of energy efficiency and energy development are adopted and implemented, in 37 - as subprograms of other programs or activities are implemented in other non-core subprograms of state programs.

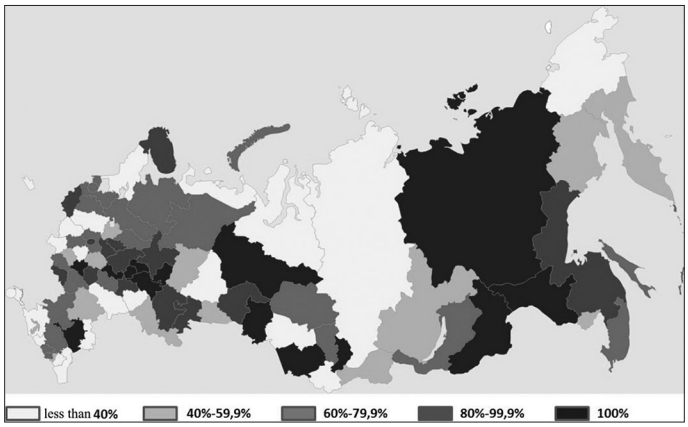
The annual monitoring of the implementation of state programs in the field of energy development and energy efficiency in the regions of Russia by the Ministry of Energy of the Russian Federation is carried out in the following key areas: The management system; technological regulation; popularization and propaganda; mechanisms to support the implementation of public policy; technical specifications (Energy Efficiency Ranking of the Russian Federation Constituent Entities).

To date, in each constituent entity of Russia there is at least one sectoral state program, which includes at least one indicator of energy efficiency (Figure 1).

The work on the formation of the target management system in the field of energy conservation should be actively continued in all subjects, since the share of sectoral programs of the RF subjects, including indicators in the field of energy conservation and energy efficiency, is only 63%.

At the same time, in 2015 and 2016, measures were not financed to save energy and improve energy efficiency in the Jewish

Figure 1: The share of sectoral state programs of the subject of the Russian Federation, including indicators of energy efficiency (State report, 2016)



Source: Compiled by the authors on the basis of the State report about the state of energy conservation and energy efficiency increase in the Russian Federation in 2016

Autonomous Region, the Karachay-Cherkessia Republic, the Nenets Autonomous District, the Penza Region, the Primorsky Territory, the Republic of Crimea, the Ryazan Region, the Chechen Republic, The Chuvash Republic. Activities in the Magadan Region and the Republic of North Ossetia-Alania have not been funded in 2016.

Financing of events only at the expense of budgetary funds was in the Vologda, Voronezh, Leningrad, Magadan, Omsk, Orenburg, Samara, Tyumen regions, the Republic of Adygea, the Chukotka Autonomous country.

In an insignificant amount, it was possible to attract extra-budgetary funds in the Astrakhan region, Sevastopol, St. Petersburg, the Irkutsk region (State Report on the State of Energy Conservation and Energy Efficiency in the Russian Federation in 2016, 2016), the Kemerovo region, the Krasnoyarsk region, the Novgorod region, the Perm region (State Report on the State of Energy Conservation and Energy Efficiency in the Russian Federation in 2016, 2016), the Pskov region, the Republics Tyva, Khakassia, the Sakhalin region, the Tver region.

One of the significant shortcomings hampering the use of government programs as a support event is the lack of a forecast for the long-term socio-economic development of the Russian Federation, which in turn makes it impossible to develop a long-term budget forecast containing estimates of limit amounts ("ceilings") of federal budget expenditures on the implementation of state programs for the period of their operation (Gabdrakhmanovet al., 2017).

As a result, there is a constant revision of the parameters of state programs both in the medium and long-term; the value of target indicators is characterized by weak realistic parameters of approved state programs. During the program indicators adjustment, the results of evaluating the effectiveness of state programs are not used, despite the existence of relevant norms

in legislative and other normative legal acts. In a number of state programs at both the federal and regional levels, various activities of different programs are evaluated by identical indicators, which makes it difficult to assess the nature and extent of the impact of individual activities on the achievement of target indicators.

Thus, in order to increase the effectiveness of the state programs of the subjects of the Russian Federation in the field of energy development and energy efficiency, it is proposed:

1. To ensure the comprehensive use of the entire set of tools during the development of strategic planning documents;
2. To envisage structuring of plans of regional executive bodies for state programs and their subprograms, as well as mandatory for the reflection of goals, objectives, indicators of state programs and activities of plans for their implementation in the plans of regional executive bodies (Zlobin et al., 2003);
3. To develop common forms and procedures for reporting on government programs (subprograms) or individual activities related to energy efficiency and energy development;
4. To work out the issue of implementing, within the framework of existing information systems, the principle of a one-time input of information necessary for the formation of any reporting forms on state programs;
5. To develop the basic principles of correlating the main directions for the implementation of activities within the framework of the objectives; as well as a set of indicators reflecting the course and direction of their evaluation;
6. On the basis of monitoring, to adjust the state programs of the subject in order to improve their effectiveness.

Thus, based on the systematization of problems, highlighting the factors that affect the nature of energy saving processes and improving the energy efficiency of the economy, it seems possible to develop optimal priorities for regional energy policy for each specific region, taking into account its specific features (Aracelov,1990).

The support instruments used to implement the state energy policy are reflected in various regulatory and legal documents, including those that differ from government programs. The analysis carried out within the framework of the study made it possible to systematize the existing support tools that could be used in the energy sector, both in the target and not in the target format.

The study of foreign experience in the application of support activities, including the toolkit, allowed to study the applied classifications. For example, in the UN report, the actions of the authorities are divided into political measures and price (quotas and tariffs) (Review of the implementation of commitments and of other provisions of the convention). In the scientific literature, one can find a division into financial, institutional tools, instruments aimed at establishing production volumes using RES, and software tools (Espey, 2001). Another approach to classification is related to the influence of instruments on supply and demand - market incentives (Bechberger, 2003).

A set of support tools for fuel and energy complex, used in the domestic economic system, the authors propose to classify according to the organizational and economic sign (Table 1).

4. DISCUSSION

The authors have developed a methodology for organizing the process of improving support tools based on the introduction of an adaptive management system for improving the energy

Table 1: Systematization of applied support instruments in the fuel and energy complex, based on organizational and economic characteristics

№	Enlarged group of instruments	Instruments
1	Financial and economic support tools	Investment tax credit
		Accelerated amortization
		Special tax deductions
		Subsidizing interest rate on loans
		Providing assurance
		Providing subsidies from the budget
		Tariff incentives
		Tariff differentiation (social benefits)
		Leasing of power equipment
		Quota of harmful emissions
2	Institutional support tools	Special investment contracts
		Energy service contracts
		Concession
		Public private partnership
		Energy audit
		Norms of generation and consumption of energy from renewable sources
3	Administrative and regulatory tools	Expanding the use of incentive-type contracts
		Patent and legal regulation of innovation activities in the framework of state contracts
		Stimulating end-users for energy saving
		Improvement of tariff regulation
		Implementation of renewable energy technologies
		Energy audit

Source: Compiled by the authors on the basis of the study of domestic and foreign regulatory and legal framework for the regulation of the fuel and energy sector

efficiency of the region's economy in a non-stationary economy that considers the impact on the dynamics of energy efficiency of internal and external factors, external and internal strategic factors, projected (managed and unmanaged) and random factors of the instruments of state support of the fuel and energy complex of the region. The methodology is aimed at improving both the support instruments themselves and the mechanism for selecting the most effective tools in terms of achieving the goals set, and consists of the consistent implementation of the six phases (Figure 2).

Stage 1: Assessment of bottlenecks in the development of the fuel and energy complex of the region's readiness to carry out activities aimed at improving the energy efficiency of the economy. During this stage, the assessment of the external and internal environment factors of the region that affect the nature of the socioeconomic development of the economy should be carried out.

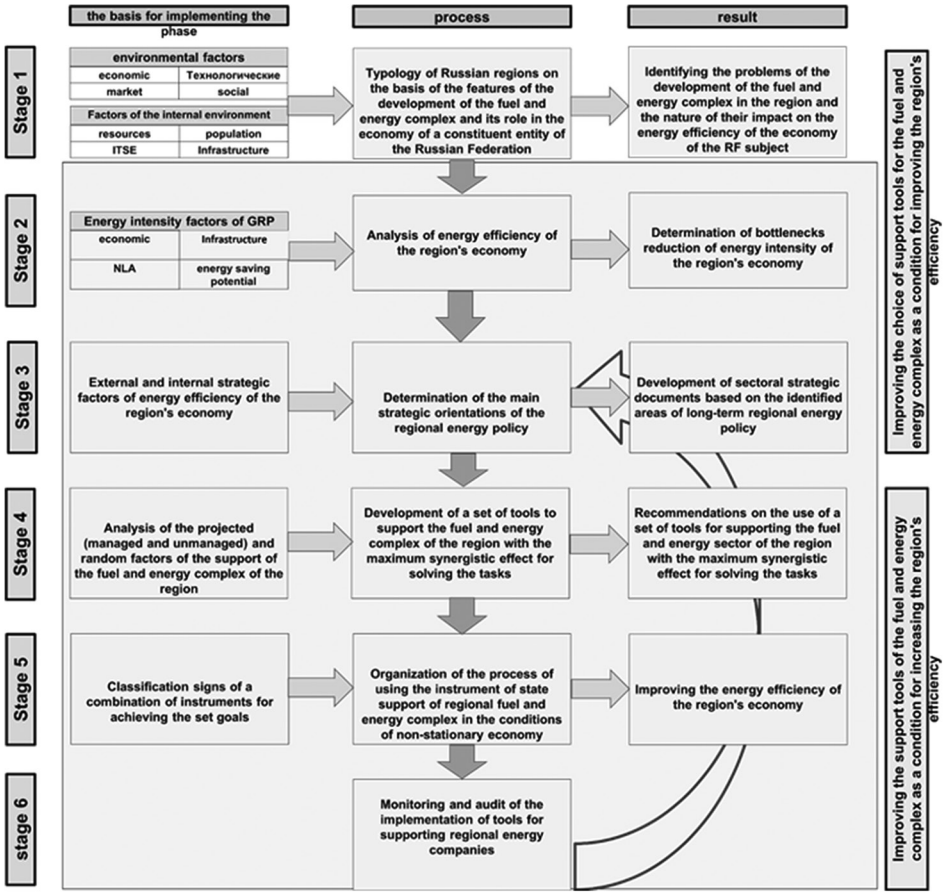
The parameters of the external environment of the territory can be represented through a complex of political, economic, socio-cultural and technological factors. They can have a significant impact on the character of the social and economic development of the territory. External to the territory factors include the state policy in the field of finance and economic legislation, tariff policy, inflation rates, conditions for investment, interest rates, availability of resources in the loan capital market, the possibility of using insurance products and derivative financial instruments (a block of economic factors); change of the conjuncture for specific types of products, services (market); change of production technologies in various spheres, access to innovations (technological); the presence of possible competitors (other territories), their weak and strong sides, the factors of competition; changing expectations of investors, entrepreneurs, the public (social), etc.

The parameters of the territory internal environment characterize the natural and resource potential of the region, the features of the sectoral and territorial structure of the economy, the situation in the labor market in the existing demographic, structural and spatial characteristics of the population.

It is essential to determine which sectors play the dominant role in the economy of the territory in terms of employment, sales, tax revenues and connections with other sectors of the economy, identifying significant links between the local and "external" economies in order to assess the impact of the regional economy sectors on changes "higher" and "subordinate" levels - regional, national and international economy and on the contrary.

It is necessary to estimate the potential of the territory for economic growth, stability or decay, to identify possible circumstances that can cause or supplement the emerging directions of energy

Figure 2: Methodological diagram of the process organization of improving tools to support the efficiency of the regional fuel and energy complex in a non-stationary economy



Source: Compiled by the authors

development in the region, determine the circumstances that can have the strongest impact on employment, sales, income (personal and public) economic productivity, quality of work and living standards in the territory.

Stage 2: Analysis of the energy intensity of the region's GRP and factors affecting its dynamics.

A characteristic feature of the assessment of the energy intensity dynamics of gross domestic product (GDP) can be a certain contradiction between the requirements for reducing the energy intensity of the economy and the region-forming role of energy-intensive industries in conditions where the transition to priority development of the service sector is not possible for all regions of Russia (Gagarin, 2002). Therefore, the target indicators of energy-efficient development of the economy of the RF region should be balanced with the target indicators of the socio-economic development of the subject and do not conflict with it.

In addition, the assessment of the dynamics of GDP energy intensity through traditional indicators used in the analysis methodologies abroad (ton of conditional fuel per unit of cost measurement of gross domestic product for the economy as a whole or output for the industry) do not give a clear idea of the change in the technological level of production. Thus, during the estimation the energy intensity dynamics with the use of the values measured in monetary terms, it's possible to see negative dynamics in metallurgy, in pulp and paper production, in the production of building materials, and positive dynamics in engineering, agriculture, chemical production. The question of how much the price conjuncture of the respective markets has affected such dynamics, as well as the shift of the intra-branch structure of the output to the production of products with higher added value, remains open.

It's still an open question: How much the price conjuncture of the respective markets has affected such dynamics, as well as the shift of the intra-branch structure of the output to the production of products with higher added value.

As methodological approaches to this assessment, we suggest considering the internationally accepted approach used both in the ODYSSEE program (Energy Directorate of the European Commission) and in the methodology of the International Energy Agency (Richtlinie des europäischen parlaments und des rates vom 23. April 2009).

Thus, as a set of main factors that have a significant effect on the energy intensity of GRP, in our opinion it necessary to consider the following groups:

- Climatic and spatial group of factors;
- A group of factors reflecting the sectoral and territorial structure of the region's economy;
- Group of factors of territory security with energy resources;
- Factors of the structure of energy consumption sectors;
- Price group of factors;
- A group of technological factors (technologies in electricity, heat and final consumers, as well as the nature of the use of production capacity).

a. The forecast of changes in the factors being investigated for the future. At the same time, based on the experience of introducing the best available technologies, so-called energy efficiency indices are separately predicted, which allow taking into account the long-term contribution of technological progress.
b. Forecast of energy intensity of GDP based on the coefficients calculated in the framework of factor analysis. The advantages of applying this approach include the high level of aggregation of the necessary initial data, the possibility of performing international comparisons of the predicted indicators. The disadvantages of the approach with regard to its use in Russia are: The lack of comparable statistical data about the change in the main factors of energy intensity over a long time horizon and the difficulty of applying widespread methods of correlation analysis due to significant fluctuations of indicators calculated in monetary terms over a long time horizon in retrospect.

The main conclusions of this stage are connected with the definition of bottlenecks and socio-economic contradictions in reducing the energy intensity of the economy of the regions.

Stage 3: Development of directions for long-term regional energy policy.

The development of long-term energy policy is complex and uses a set of analytical tools (Table 2). Each of the tools has proved its effectiveness at certain stages of the development of program-target documents. Their key task is the correct definition of the goals, objectives and directions of the development of the region, highlighting activities that contribute to the achievement of the goals and objectives of strategic development.

The process of analyzing the external factors of the strategic planning of the territory is carried out in several stages:

1. Audit of the main socio-economic, market and technological factors of the development of the Russian economy and the macro-region, which includes the territory of the subject for determining the main development problems and formulating the basic goals and objectives of the strategic planning documents for the region.
2. Determination of the region's competitiveness factors in the modern economic space of the country and the global space

Table 2: Application of strategic planning tools in the development of strategic planning documents for regions

№	Strategic planning tool	Part of the strategic planning document, developed on the basis of application of the tool
1	PEST- and SWOT-analysis of the territory	Goals and objectives
2	Competitiveness analysis	Definition of target indicators
3	Foresight technology	Identification of targeted activities and basic activities for their achievement
4	GIS-technologies	definition of target indicators and connection with territorial development schemes

Source: Compiled by the authors

as a whole.
3. Systematization of information on the elements of the social and economic development of the territory and determining their common and individual development problems, proposing ways of development aimed at their solution.
4. Identification of possible options for the territory development with the possible changing external and internal factors affecting socio-economic development.
5. The condition for successful forecasting and strategic analysis is the analysis of the dynamics of the development indices of the specialization sectors of the regional economy and the most in demand in the domestic Russian and world markets; also an integral assessment of the dynamics of changes in the natural and social spheres of the region as a projection of the efficiency of using its potential.

At the same time, it is important to determine the list of final indicators of development, the dynamics of which most reflect the nature of the influence of all types of potentials on the spatial development of the energy sector, the regional economy, the efficiency of energy production in the region, etc. The results of the assessment of such indicators can be used, among other things and in the formation of scenario conditions for the long-term development of the region's fuel and energy complex. Scenario approach in the opinion of the authors can be taken as a basis for a deeper study of the methodology for improving tools for supporting the fuel and energy sector.

It is advisable to select the indicators, based on the system of "cross-cutting indicators" in the documents of strategic planning of the federal and regional level (long-term forecast of social and economic development, sectoral strategies, government programs of the Russian Federation, etc.), national priority projects and "May decrees" taking into account the system of balanced indicators reflecting the main parameters of socio-economic development, namely (Table 3):

Table 3: Proposed system of balanced indicators for assessing the effectiveness of activities in the field of energy efficiency and energy development in the context of the alignment of strategic planning documents

Balanced scorecard	Long-term forecast of social and economic development	Energy Strategy	Indicators of the Energy Efficiency and Energy Development Program of the Russian Federation	Recommended indicators for the state program in the field of energy efficiency and energy development of the subjects of the Russian Federation
Staff			Dynamics of labor productivity in the fuel and energy sector (% of the previous year)	Dynamics of labor productivity in the fuel and energy sector (% of the previous year)
Finance		GDP growth (% of 2000)		GDP growth (% of 2000)
		Growth in industrial output (% of 2000)		Growth in industrial output (% of 2000)
		Specific energy intensity of the gross domestic product (% of 2000)	Reducing the energy intensity of the gross domestic product of the Russian Federation through the implementation of the activities of the Program (% of 2007)	Specific energy intensity of the gross domestic product (% of 2000)
		Specific energy intensity of the gross domestic product (% of 2000)		Specific energy intensity of the gross domestic product (% of 2000)
	Export - total (million tons of equivalent fuel)	Export - total (million tons of equivalent fuel)		Export - total (million tons of equivalent fuel)
			Specific weight of expenses for technological innovations in the total volume of shipped goods, works performed, services of industrial production organizations	Specific weight of expenses for technological innovations in the total volume of shipped goods, works performed, services of industrial production organizations
Infrastructure	Average depreciation of fixed assets (% of 2005)	Average depreciation of fixed assets (% of 2005)		Average depreciation of fixed assets (% of 2005)
		Creation of additional energy potential of economic development		Creation of additional energy potential of economic development
		Formation of the high-tech segment of energy services in the volume		Formation of the high-tech segment of energy services in the volume

(Contd...)

Table 3: (*Continued*)

		Growth of the length of the main gas pipelines (% of 2005)		Growth of the length of the main gas pipelines (% of 2005)
		Share of the reconstructed operating gas pipelines (%) in the total length of the Unified Gas Supply System		
	Power generation	Power generation		Power generation
		Average specific fuel consumption in boiler houses (% of 2005)		
		Increasing the energy efficiency of buildings (% of 2005)		
		Level of heat losses (% of total heat production)		
		Reduction in the average depreciation of fixed assets (% of 2005)		Reduction in the average depreciation of fixed assets (% of 2005)
		Depth of crude oil processing		
		Loss of electricity in electric networks from the total volume of electricity supply	Loss of electricity in electric networks from the total volume of electricity supply	
		Oil production, including gas condensate		
		Extraction of natural gas and associated gas		
		Coal mining		
Population (consumer)		Growth of per capita energy consumption, (% of 2005)		Growth of per capita energy consumption, (% of 2005)
	Power Consumption			Power Consumption
		Growth of per capita electricity consumption (% of 2005)		Growth of per capita electricity consumption (% of 2005)
		Increase in per capita consumption of motor fuel (% of 2005)		Increase in per capita consumption of motor fuel (% of 2005)
		Domestic consumption of primary fuel and energy resources (million tons of equivalent fuel)		Domestic consumption of primary fuel and energy resources (million tons of equivalent fuel)
		Internal electricity consumption (billion kWh)		Internal electricity consumption (billion kWh)

Source: Compiled by the authors on the basis of the analysis of the documents of strategic planning of the federal level

- "Personnel" - indicators that characterize the workforce (salary level, labor productivity, qualifications, etc.);
- "Finance" - indicators characterizing financial and economic development (structure and dynamics of investments, gross regional product, etc.);
- "Infrastructure" - indicators that characterize the technical and economic development, the factors for achieving results laid down in the programs, etc.;
- "Population" - indicators that characterize changes in qualitative and quantitative indicators of the population of the region.

Analyzing the multifactority and multidirectional processes of socio-economic and spatial development of the energy complex which is associated with a great variety of external and internal effects on the territory, it is advisable to consider four possible scenarios for the development of the fuel and energy complex in

the region: Pessimistic, inertial, basic and innovative.

Scenarios differ depending on the degree of intensity of the use of acceleration factors of socio-economic processes, such as investment, innovation and technological, structural and institutional transformation. The activities of state authorities and local self-government bodies, major enterprises, business associations and unions, trade unions, civil society institutions and other actors involved in the development and implementation of social and economic policies have a significant impact on the implementation of a scenario (Poletaev, 2012).

Thus, the correct use of the proposed strategic planning tools in the energy sector will make it possible to enhance the effectiveness of the goal-setting documents at all levels, the development of a system of target indicators, and improve the effectiveness of the alignment of strategic planning documents.

Stage 4: Development of tools set to support the fuel and energy complex of the region with the maximum synergistic effect for solving the tasks.

The basis for the effective use of government support tools is, first of all, the allocation of their key elements that determine the success in achieving the stated goal and conditions for the most effective impact of this set of tools and their power characteristics on the achievement of results: The way, direction and nature of the impact, to changing conditions.

Any tool that we use to achieve our energy saving and energy efficiency goals has certain characteristics. The set of characteristics of any instrument is standard, but in different types of regions it will occur in different ways.

As a result, several tools with different characteristics and the combination of these characteristics in the group will give a synergistic effect that will enhance the effectiveness of achieving the goals set at the lowest cost. The right combination will achieve the highest possible efficiency.

It is necessary to take into account the nature of the impact of general and specific instruments of state support.

Stage 5: Introduction of instruments to support regional energy sector in a non-stationary economy.

State programs are the most effective tool for implementing the necessary mechanisms for implementing measures to achieve energy efficiency and energy disparity in regions in a non-stationary economy, since non-stationarity is manifested in poor predictability of the external and internal environment of management. In conditions of non-stationarity, the behavior of economic entities is difficult to forecast, which causes an increase in the probability of crisis phenomena in the economy.

Developed considering all the requirements for strategic planning documents, the state program becomes the most effective mechanism for implementing policies in the field of energy conservation and improving the energy efficiency of the economy.

Activities that should lead to a reduction in the energy intensity of the gross regional product of any region can be included as a separate state program, be an independent subprogram of a comprehensive program, or part of separate sectoral programs. In any case, in the integrated state program aimed at improving the energy efficiency of the region's economy, final targets, actions aimed at achieving these values, as well as tools that will contribute to achieving results with the least cost and maximum socio-economic effect should be recorded.

In an ideal format, the state program should regulate the choice of the most effective tool for all actors associated with the implementation of energy-saving policies in the region.

Stage 6: Monitoring and audit of the implementation of instruments for supporting regional energy enterprises, as necessary conditions for achieving energy efficiency and non-volatility in the region.

The mechanism for improving the instruments of state support for the regional fuel and energy complex should include an organizational, economic and financial component based on specific principles, contain certain stages of designated entities and a set of established standardized procedures for internal and external interaction, including monitoring, monitoring and audit procedures, which is a prerequisite for achieving energy efficiency and non-volatility in the region, while at the same time strengthening the country's energy security.

The work under this stage is based on the following principles:

- The principle of scientific validity means the study and use of modern tools, methods and techniques in the work process, ensuring its continuity and efficiency through appropriate software, a scientifically sound approach to control and pay, unified standards, instructions, regulations, regulations, etc.;
- The principle of legal capacity and economic necessity. It reflects the validity of the applied methods, including methods for improving the support tools of the fuel and energy complex, as a necessary condition for achieving energy efficiency and energy independence of the region, their compliance with state objectives and the concept of reforming the country's budget system. For government regulatory agencies it means monitoring, studying, analyzing the conformity of implemented techniques to the current legislation, which is a prerequisite for achieving energy efficiency and non-volatility in the region;
- The principle of the integrated planning and assessment of the effectiveness of the professional activities of government regulatory agencies provides for the planning of all production and economic activities of the fuel and energy complex enterprises in the interrelation of all their elements, including the main and auxiliary industries, service structures and functional structural units at all levels of government. This principle means the unity of all activities within the framework of the above process and the clarity of the interrelation between these elements, which means the connection of input and output data: On the basis of actual data on conducted

inspections, an analysis is made of the effectiveness of the activities of the relevant units of state control over execution, and on the basis of analytical information changes in plans, corrective measures are being developed. Thus, the work of fuel and energy enterprises is optimized.

- The principle of unity, which presupposes the systematic nature of the information flow, based on the coordination of units in the process of carrying out activities by government regulatory agencies at the horizontal level (for example, information on identified inconsistencies in the requirements of the guidance material, federal legislation enters the normative activities unit, inconsistencies and changes are introduced), and, accordingly, the formation and transmission of information of the flow within the management hierarchy (reports on budget funds spent checks, etc.);
- The principle of continuity lies in the fact that the processes of planning, expertise, and audit of the effectiveness of the implementation of instruments for supporting the regional fuel and energy complex, as necessary conditions for achieving energy efficiency and energy independence of the region, are of a permanent nature within the established cycle (budget expenditures, implementation of the budget program/project);
- The principle of accuracy presupposes the concreteness and detail of the results of the activities of government regulatory agencies over enterprises of the fuel and energy complex, to the extent that external and internal conditions of activity permit.
- The principle of consistency implies that all stages of the implementation of activities by government regulatory agencies: Planning of inspections, conducting inspections, identifying violations, identifying inconsistencies in the regulatory guidance component, analysing data, developing activities with the identification of personal responsibility (developing corrective actions), monitoring the implementation of activities, planning performance indicators should be set out in a systemic sequence, thereby achieving an energy efficiency of the region.
- During the finalizing and supplementing the mechanism for improving the instruments of state support for regional FECs, it is proposed to use a systematic approach to the study of the problem, expressed in its element-wise aspect. The structural aspect of the system approach is the approach based on "input" - "Output."

To maintain the specified parameters of the target programs during their implementation, the question arises as to the meaningfulness of the escort process. It is proposed to name such a process "maintenance of energy efficiency," which includes preliminary examination, scheduled inspections, audits, monitoring, monitoring of implementation, examination of the implemented project. Participants (subjects) of the mechanism: Government regulatory agencies, expert agencies (attracted independent experts, there may be higher educational institutions, research institutes (scientific research institutes), professional experts - accredited, expert communities); accredited auditors. The subjects interact with each other by performing a set of established standardized procedures: Examination at the entrance, monitoring implementation (spending budget funds), scheduled inspections, audits and monitoring and expertise after the completion of the program (project). Thus, if all of the above conditions are met, energy efficiency and non-volatility of the region are achieved.

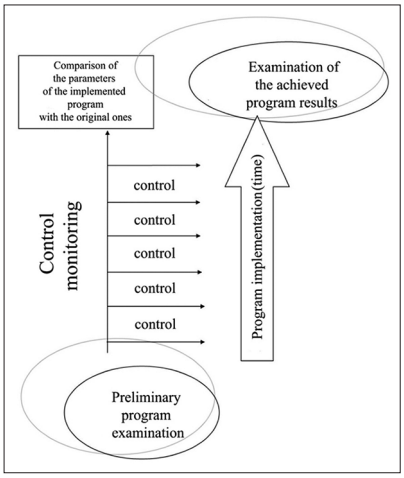
1. Criteria for preliminary examination;
2. Organizational-methodical aspect of monitoring of enterprises of the fuel and energy sector:
   - Activity of government regulatory agencies;
   - The course of spending, the implementation of energy programs (project).
3. Indicators verified during the implementation of audits, audits, control;
4. Examination criteria in the end;

Dynamic representation of the process of maintaining energy efficiency can be enlarged on the timeline (Figure 3).

At the first stage, the application of the examination is intended to identify the feasibility of the size of the costs of implementing the mechanism, the size of its parameters, conditions, etc. During the implementation of the mechanism for improving the instruments of state support for regional fuel and energy complex, state control is carried out as a cross-section of intermediate parameters (target expenditure, degree of implementation, etc.), and audits are used to correct possible shortcomings.

Depending on the contents of the mechanism, the frequency of the control checks can vary. The final stages presuppose an expert evaluation of the achieved parameters, the establishment, if necessary, of a deferred effect. In such conditions, the use of the audit and examination of the effectiveness of the mechanism should be most appropriate, since in the implementation of specific budget programs there are specified parameters, rules, directions for the implementation of costs and reasons for such costs. The prerequisites for joint application of control, audit and expertise are their similarities and differences (Table 4), and it is the differences that complement each other and contribute to filling the content of the process of supporting energy efficiency (budget expenditures, budget projects/programs).

Figure 3: The process of supporting the optimization of the process of energy efficiency in the region



Source: Developed by the authors

Table 4: Criteria matrix of compliance of control, audit, examination of the implementation of instruments for supporting regional energy enterprises, as necessary conditions for achieving energy efficiency and non-volatility of the region

№	Elements of the maintaining efficiency process/comparison criteria	State control	Audit	Expertise
1	Subject	Government agencies operating in the field of energy saving and energy efficiency	Private company with proper license	Private company with proper license
2	Object	Financial and economic activities of organizations associated with the implementation of activities	Targets of energy efficiency	Compliance of actions to achieve energy efficiency regulatory framework
3	Goal	Revealing the facts of deviations from standards	Determining the reliability of parameters	Determining the reliability of parameters
4	Result	Sanctions	Recommendations for error correction	Clarification and adjustment of parameters
5	Foundation	Prescription, plan of inspections	Mandatory audit, contractual relations	Mandatory expertise, contractual relations
6	Criteria	Performance-based budgeting programs in regional budgets, that put into regional budgets	Performance-based budgeting programs in regional budgets, that put into regional budgets	Performance-based budgeting programs in regional budgets, that put into regional budgets, strategic planning documents in the field of energy saving
7	Character	Mandatory	Mandatory, initiative	Mandatory, initiative

Source: Developed by the authors on the basis of regulatory and legislative acts

Thus, the support of energy efficiency can be defined as a process that includes procedures for state control, monitoring, audit, examination of the implementation of instruments for supporting regional energy enterprises, as necessary conditions for achieving energy efficiency and non-volatility in the region.

The fusion of control, audit and expertise in the implementation of instruments for supporting regional energy institutions within the framework of increasing the effectiveness of state control should occur strictly in hierarchical order. In this case, the control function of the process of escorting efficiency is the fundamental one in the "result" parameter. It is the application of strict sanctions in the context of the formation of a program-targeted approach to the formation and execution of the budget, the prospect of punishment for allowing deviations in the framework of spending budget funds can ensure the full implementation of this proposal. It is advisable to monitor the implementation of specified parameters of various budget expenditures, the budget program/project. In the future, the importance of the "examination" and "audit" parameters for the implementation of instruments for supporting regional energy companies can be balanced.

Proceeding from the foregoing, the introduction of an energy efficiency support process that should acquire a three-dimensional content: (1) Control; (2) monitoring; (3) expertise, will serve as a fundamental element of the mechanism for improving the instruments of state support for regional fuel and energy complex.

5. CONCLUSION

The analysis of normative acts and resolutions as well as scientific literature has made it possible to clarify the notion of the concept of "state support in the fuel and energy sector," to explore approaches to the classification of support instruments, to study and systematize the support instruments used in Russia on the basis of the organizational and economic sign.

The authors determined a power-based indicator of the inclusion of targeted energy efficiency characteristics in each constituent entity of the Russian Federation, an infographic map was compiled. In most of the RF subjects, support tools for FEC are used in a limited number or in a single form. Complexity and effectiveness of the use of state support, including tools, can be implemented with the preliminary formation of a set of tools based on the methodology developed.

The methodology of organizing the process of improving the instruments for supporting the regional fuel and energy complex was developed in the context of uncertain economic environment and taking into account the initial stage of development of stable energy in the country.

The methodology is based on a six-step process, considering the impact of certain factor groups. A functional presentation of the methodology for improving energy efficiency tools can be presented in the following form:

ISIfec = f (extEFT, intEFT, extSF, intSF, FFSIOfec, UFSIOfec),

where:

ISIfec - conditions for improving the supporting instruments of the fuel and energy complex of the region;
extEFT - external environmental factors of the territory;
intEFT - internal environmental factors of the territory;
extSF - external strategic factors of development of the region's energy complex;
intSF - internal strategic factors of development of the region's energy complex;

FFSIOfec - forecasted (managed and unmanaged) factors of the support instruments operation of the fuel and energy complex of the region;

UFSIOfec - unpredictable factors of the support instruments operation of the fuel and energy complex of the region.

The first three stages are related to the improvement of the choice of tools, the remaining ones are related to the process of improving the instruments themselves based on the introduction of an adaptive management system for improving the energy efficiency of the region's economy in a non-stationary economy.

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