

THE “IMMUNITY” OF REGIONAL FUEL AND ENERGY COMPLEX AND ITS EVALUATION

This article describes theoretical and methodological bases of a complex analysis and evaluation of economic systems' sustainability and their usage in methods of energy systems management. The research provides factors that create competitive advantages of fuel and energy complex (FEC) in a region on different stages of economic development.

The necessity of the development of modeling tools for the improvement of the effectiveness in administrative decisions in order to provide the competitive ability of energy systems is depicted.

Keywords: energy system, sustainability, competitive advantages, effectiveness, management.

Problem description

Currently country's energy industry has formed as an infrastructure that connects enterprises that produce and distribute fuel and energy resources for the purposes of economy and people. Firstly, the sustainable functioning and development of the energy industry is one of the most important ways of increasing the quality of life level for citizens and social stability in country. Secondly, it is a guaranty for a stable income of the main currency funds gained from the export of the resources. Thirdly, factors and preconditions that form economic sustainability of energy systems also determine the energetic security, which is the main attribute that establishes the possibility of sustainable socio-economic development of Kazakhstan in the surrounding world.

The importance of ensuring the sustainability of energy system increases at the present period, because the coming period of development of Kazakhstan's energy sector, including the rest of the economy due to their symbiotic relationship, is the estimated period of accelerated industrial and innovative development, characterized by further economic growth, modernization of production and the extensive use of innovative technologies in production and delivery of services.

There is a whole series of adverse circumstances – the reorientation of trade flows to service the foreign market and the increased dependence on it, the degradation of the technosphere, including the fuel and energy complex (FEC), depletion and improper replenishment of the FEC resource base, increased transaction costs, tightening environmental restrictions, and others. The recent period emphasizes this problem. Efficient implementation of deregulation and competition is designed to increase the efficiency in energy sectors, but it is

complicated by the presence of the above-mentioned negative trends. In addition, it increases the uncertainty of their functioning and development that creates mutual and interdependent systems and regions. In terms of transcendental processes the concept of sustainable economic systems will, in our opinion, in the task of overcoming the prevailing trends, increase the flexibility of energy systems and the overall effectiveness of their development.

Analysis of the existing approaches to the investigated problem

Integrated studies of energy in the system of its external relationships are reflected in the works of many native scientists: L. S. Belyaeva, A. Z. Gamma, Y. D. Kononova, A. A. Makarova, L. A. Melent'yeva, A. S. Nekrasova, B. G. Saneeva, N. I. Suslova, and other researchers. Theoretical and practical aspects of the economy of energy described in the works of L. D. Gitelmana, V. I. Zorkaltseva, V. A. Kryukova, A. I. Kuzovkina, T. V. Lisochkinoy, M. V. Lychagina, B. E. Ratnikova, Y. V. Sinyaka, L. D. Khabacheva, V. I. Edelmana and others. To the study of the problems of economic and energy security of the country, adaptability and reliability of large power systems have made a significant contribution the works of L. I. Abalkin, V. V. Bushuyev, N. I. Voropai, V. G. Kitushin, V. R. Hams, N. Rudenko, V. A. Smimov, V. Sokolov and other.

However, the existing methodology and research methods of energy systems today require development due to fundamental changes in the country's industrial relations and socio-economic conditions. The main problem in resolving the sustainability of the operation and development of economic systems is, in turn, structuring of issues in decision-making management in situations that are characterized by uncertainty of future conditions for the development

and operation of these systems as well as their inertia, especially for energy systems. In this case there is a need to create the flexibility and adaptability. However, currently many questions in systematic approach to economic sustainability are not well understood neither in the composition of the task nor in relation to the unit of its description or in the application in the management of real economic objects.

Main results of the research

A definition of economic stability in relation to the economic system and the structuring of the concept are suggested. The connection between the stability and the adaptive characteristics is established.

The term “immunity” comes from the Latin *immunis*. Its meaning in ancient times was understood as “being under good protection, resistant to infectious disease”. Immunity supports constant internal environment, eliminates the negative effects of environmental factors.

The immune system (immunity) of the fuel and energy complex (FEC) – is a protective mechanism for functioning of the complex in changing conditions of market economy. The immunity of FEC should provide not only the replacement of damaged or physically (mentally) obsolete fixed assets, but also its protection from adverse environmental factors (inflation, domestic and foreign competition, the general economic downturn, the depletion of natural and mineral resources, environmental degradation, etc) and its competitiveness.

The immunity of FEC can be defined as:

- sustainability of the complex to the effects of negative factors;
- ability in a relatively short period of time to get out of the risk situation without appreciable loss.

Indicators of immune complex include the following:

- ability to compete with other companies producing similar goods (services) at a certain time;
- steady state of the internal environment (fixed assets, material, financial and human resources, technology, management, marketing, etc.);
- ability to respond flexibly to the conditions of the environment and to develop dynamically in any situation.

One of the most important indicators of sustainable immunity of an energy complex is its competitiveness.

The world economy is undergoing qualitative changes associated with globalization, uneven development, intensification of the struggle between the trends of formation of unipolar and multipolar world, increased competition between countries, regions and companies [1]. Under these

conditions, when the market is gaining recognition as a common-civilization values, strength and power of any country is increasingly determined by the competitiveness of its producers. Improving the competitiveness of countries, regions, industries, businesses (enterprises, organizations) put the main objective in the development of strategies for their development. Development of the fuel and energy complex depends on all elements of the market and, above all, from the competitiveness of firms. Providing conditions for civilized and dynamic market, the creation (formation) of competitiveness – is a key element in the number of national and regional priorities in any country and the most important function of state regulation of the economy. However, many problems of defining and shaping the competitiveness of industries, regions and the country as a whole in this process remain unresolved.

There are various methods for assessing competitiveness, built on the basis of statistical indicators, peer reviews, ranks, etc.

The competitiveness of the regional FEC – efficiency (performance) of the usage of industry resources, and especially of labor and capital, as compared to other regions of FEC, which is estimated in the first place by indicators of output and sales of energy resources, as well as its dynamics. Due to the high complexity it can be evaluated by the system of indicators.

Well-being of the regional FEC can be reached by four main criteria: per capita in terms of production, largest production resources (fixed assets, etc.), largest natural resources, by the presence of human resources (usage efficiency). Under the current economic situation in Kazakhstan, a large depreciation of fixed assets (physical and mental), the provision of national economy by the reproduction process based on modern technology and innovations becomes important and requires investments. Therefore the level of foreign direct investments in the region should be added to the abovementioned characteristics, taking into account the volume required for reproduction, including the high-tech manufacturing. To assess competitiveness factors in the formation of the complex as a whole and the possibility of exposure to regional authorities on its components the model of the “national rhombus” proposed by M. Porter can be used [2] for the country. Complex role in the creation of competitive advantages of the region can be described in four interrelated areas (determinants), forming a “regional rhombus”: factors of conditions (natural resources, skills, capital, infrastructure, etc); demand conditions (income elasticity of demand, demand of the quality

of goods and services , and others.); related and supporting industries (provide the necessary resources, components, information, banking, insurance and other services for the complex); company strategy, structure and rivalry between them (create a competitive environment and develop a competitive advantage). In turn, each determinant is analyzed by components, by their impact on the competitive advantage of the region, as well as by the need for their development.

Development of the competitiveness of the complex is implemented in the following four stages (levels):

- competition based on factors of production;
- competition on the basis of investment;
- innovation-based competition;
- competition on the basis of wealth.



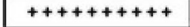
The first three stages provide economic growth, the last one leads to stagnation and decline.

The competitive advantage of the regional FEC is provided by (pic.):

In modern conditions it is advisable to focus on stage investments with the subsequent transition to innovative development. But already today there is an objective need for innovative “content”-attracted investments. In the creation of competitive advantage in regional FEC scientific knowledge and education both as a factor of production, and as a factor of its innovation potential are important.

Criterion-oriented approach (COA) can be used for the formation of the system’s competitiveness. For administrative tasks it is necessary to form goals in quantitative temporal dimension. Tree of objectives can be the basis for constructing a hierarchy of the objectives for each specific regional FEC (or groups of regions), taking into account its specificity. Efficient allocation of resources, creation of conditions of production, assessment of the impact of various factors and determinants on competitiveness of the complex, structural policies, the development of programs to improve the competitiveness of region, ranging strategic objectives are

Stages	Determinants			
	Factors	Strategies	Demand conditions	Related industries
Factors of production	+++++			
Investments	+++++	+++++	+++++	
Innovations	+++++	+++++	+++++	+++++
Wealth	+++++	+++++	+++++	+++++

	– determinant is not used;
	– determinant is used partly;
	– determinant is used.

Picture. Formation of competitive advantages of regional FEC at different stages of economic development

- in the first stage – due to factors of production: natural resources, favorable conditions for production, skilled labor (provided by one determinant);
- in the second stage – on the basis of aggressive investment (mainly domestic firms) in education, technology, licenses (provided by three determinants);
- in the third stage – through the creation of new products, production processes, organizational solutions and other innovations by the action of all the components of the “square”;
- the fourth stage – due to the expense of already created wealth and relies on all the determinants that are not fully utilized.

established considering the importance of the objectives and criteria weights [3–6]. Moreover, the COA can serve as a basis for controlling the formation of the competitiveness of the regional FEC.

The final stage of criterion-oriented approach is the creation of programs on the basis of the objectives tree. Achieving the competitiveness regional FEC can be provided by the following programs: “Formation of factors of production”, “Stimulating demand”, “Development of innovative products” and others. COA mechanisms contribute to the integration and coordination of all levels, branches and management bodies of the complex, and increase administration efficiency of regional FEC.

The competitiveness of the regional energy sector ensures the growth of the regional economy on

the path of innovative development. Therefore, in the present conditions the increase of the competitiveness of FEC has become one of the main strategic objectives of economic development on the regional level and the country as a whole.

Conclusions

A comprehensive approach to the study of economic stability in conjunction with adaptive properties of economic systems and its application to

explain administration mechanisms of ensuring the sustainability of energy systems is provided. This approach involves the expansion of the number of quantitative indicators for evaluating the adaptive characteristics, the qualified and formal analysis of the basic premises that determine the sustainability of the various systems of economy, construction and economic-mathematical analysis of modeling tools in order to improve the validity of administrative decisions in the field of establishing the sustainability in economic and energy systems.

References

1. Shekhovtseva L. S. Competitiveness of the region: factors and method of creating / L. S. Shekhovtseva // Marketing in Russia and abroad. – 2001. – № 4. – P. 12–15.
2. Porter M. International competition / M. Porter. – M. : International relations, 1993. – 896 p.
3. Saparbayev A. Risk as a Factor of Stability and Development Energy / A. Saparbayev, A. Demesinova // Modern Science: Problems and Perspectives : International Conference. Vol. 4. Las Vegas, NV, USA. April 15, 2013. – Compiled by : ICET, USA. 2013. – P. 514–517.
4. Saparbayev A. D. Optimization of energy flows in the energy balance of the region / A. D. Saparbayev, A. A. Demesinova // Kainar university Vestnik. – 2014. – № 3. – P. 76–80.
5. Saparbayev A. D. Energy development strategy of energy deficit in the region: approaches, principles / A. D. Saparbayev, A. A. Demesinova // Recent problems in economy : International Journal with impact factor. – Kyiv, 2014. – № 2 (152). – P. 262–272.
6. Saparbayev A. D. Strategic approach to energy development in the region / A. D. Saparbayev, A. A. Demesinova // Problems of the theory and practice of management : International journal with impact factor. – Moscow, 2013. – № 5. – P. 87–91.

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«ІМУНІТЕТ» ПАЛИВНО-ЕНЕРГЕТИЧНОГО КОМПЛЕКСУ РЕГІОНУ ТА ЙОГО ОЦІНКА

У статті розглянуто теоретичні основи та методичні положення комплексного аналізу та оцінки стійкості економічних систем, зокрема особливості їх використання в методах управління системами енергетики. Досліджено фактори, які формують конкурентні переваги паливно-енергетичного комплексу (ПЕК) регіону на різних стадіях його економічного розвитку.

Обґрунтовано потребу розробки модельного інструментарію для підвищення ефективності управлінських рішень з метою забезпечення конкурентоспроможності енергетичних систем.

Ключові слова: енергетична система, стійкість, конкурентні переваги, ефективність, управління.

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