The development of the Eurasian economic space based on the model of “economic cross”

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The object of this article is to review the energy system of the Eurasian Union. The subject of consideration is the existing system of production, financial and other communication channels in the energy sector. The purpose of this article is adaptation of the methodology of “economic cross”, proposed by the authors, to the standards of the Federal Law “On the strategic planning in the Russian Federation” (172-FZ of June 28, 2014) and describing the results on the example of its use for the purpose of forming the united energetic sector of the Eurasian Union.
The paper rises the questions, concerning the efficiency of a modern system of integration processes in the Eurasian space in the energy sector. The main impediments to its effectiveness and impeding innovation reorientation of energy production of the Eurasian Union are identified. The methodology of energetic organization structure simulation is proposed in this article. It describes communication channels between the Eurasian Union members’ energy enterprises, which currently operate mainly in the context of national energy systems for now. An important advantage of the proposed article methodological tool for predicting the strategic development of energy systems is that it provides the ability to detect the early stages of spillovers from the actions of participants in all stages of the “economic cross” and allows you to compare the different “economic crosses” models.

Key words: Eurasian Union, energy, innovation, technique of forecasting of strategic development, integration, import substitution, foresight analysis.

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The main directions of the Eurasian energy cooperation development

The experience of the economic cooperation of integration groupings over the course of the last century shows that their economic efficiency and political and social stability in the short term depend on the existence of the community of economic interests, and in the long term they depend on the quality and structure of world economic ties and infrastructural factor. At the initial stage (first 3–5 years) sustainable integration associations are primarily net-consumers of economic resources, and only in subsequent years discounted cash flows which are derived by participants of the integration project, become positive.

The energy aspect is the key direction in the structure of investment portfolio of Eurasian Bank of reconstruction and development for capitalization (30.4%) [1].

In the context of a long-term strategy in the energy sector of the EEU, the development of cooperation is possible in the following areas:

1. Intensification of the development of deposits of traditional fuel types [2].

2. Providing with more rational use of available production capacities in the member-countries of the Union and their modernization and expansion in accordance with the principle of Pareto-optimality. Maximization of the positive effects of economy of scale and providing with more deep division of labor.

3. The implementation of major strategic projects in the energy sector, primarily nuclear. The creation of highly efficient energy system, covering the entire Eurasian Union and based mainly on Russian technology will allow us to solve several energy problems of the Union.

Conceptually the development of the Eurasian Union in the next years will be determined by the logic of economic cooperation that originated in the Soviet years. As previously noted, the reason for this is the infrastructural factor, forcing the producers regardless of their political affiliation or ethnicity to take the model of the international division of labor (IDL), which was defined in the Soviet times. This state of affairs raises the question not about the creation of new Trans-Eurasian industry, but about the reconstruction of the old one, as in the case with food industry [3], in the shortest possible time.

The existing system of ties in traditional related fields can be taken as a basis during the development of integration model and development of innovative energy producing operations of the Eurasian Union.

Let us consider how the cooperation is carried out in the oil and gas sector and on the basis of the revealed regularities and contradictions we offer a complex model of collaboration for innovative energy.

Foresight analysis of the fundamental principles of modern model of cooperation in the frameworks of the Eurasian Union in the energy sector

At the moment the main direction of development of energy relations in the frameworks of the Eurasian Union is cooperation in the oil and gas sector. According to official statistics [4], the potential of the Eurasian Union allows us to provide approximately 3-, 4-fold increase in interstate trade. However, taking into account the current infrastructure reserves [5], the potential of growth of operations both within the Union and outside is 30% of the finished products and 45–55% of raw materials.

However, within the existing structure of economic relations it is difficult to realize the existing potential: only a small increase in exports of petroleum products through the Belarusian sector (13%) is possible, while it is more profitable for producers from other countries to sell crude oil to Western and Chinese companies.

The problem of innovation of existing production is as follows (Fig. 1).

In the case, if the payment under the contracts of the manufacturing company will not be implemented in time, the company will have serious problems with the current indicators of financial and economic activity and with the possibility of further work in the market because of the lack of incoming streams. Thus, for reorientation of national companies to more effective ties of the Eurasian Union and the maximization of beneficial effect from the collective development of the markets of South East Asia and Latin America [6] the following is required.

The difference between the profit of the manufacturing company (π) and the payments under contracts (C) and losses from refusal of the existing links (C_1) caused by changing of the conditions on contracts, in a certain time period, which do not exceed the production cycle (T), must be positive. In other words:

$$\pi - C - C_1 + \Delta > 0.$$

The value Δ must be formed from the gains from further exploitation of economic ties on the one hand and, on the other hand, from those losses which can be avoided with its help in the future. However, the value Δ must be received by the company in the period, which does not exceed the cycle T.

The first condition is the presence of the Eurasian project with a value sufficient to compensate the potential losses of the companies. As such we can mention the project of modern innovative energy. By 2020 it is expected that growth of demand in energy will be about 50% [7] from the current value, and the value of alternative oil and gas sources of energy will sharply increase, too. Project of blitz transition of the world economy to alternative energy has largely failed, and the atomic project after the Fukushima disaster on opportunistic considerations was abandoned in many regions, which are potential competitors. For example, in 2012 in Japan for 50 ready to use units, only one was maintained in functional status, Germany has announced about the refusal of nuclear project by 2022, according to the results of the referendum in 2011 Italy and other key European countries [8] refused from further development of nuclear energy. In fact, apart from Rosatom only the USA and France remain competitors to the Eurasian Union on the global market (about 80% of their energy is accounted for their nuclear component), China is in the list of potential partners.

At the same time, the traditional energetics of the Eurasian Union, including Belarus export of oil products, created from Russian raw materials, in the long term is found under the threat on the part of the

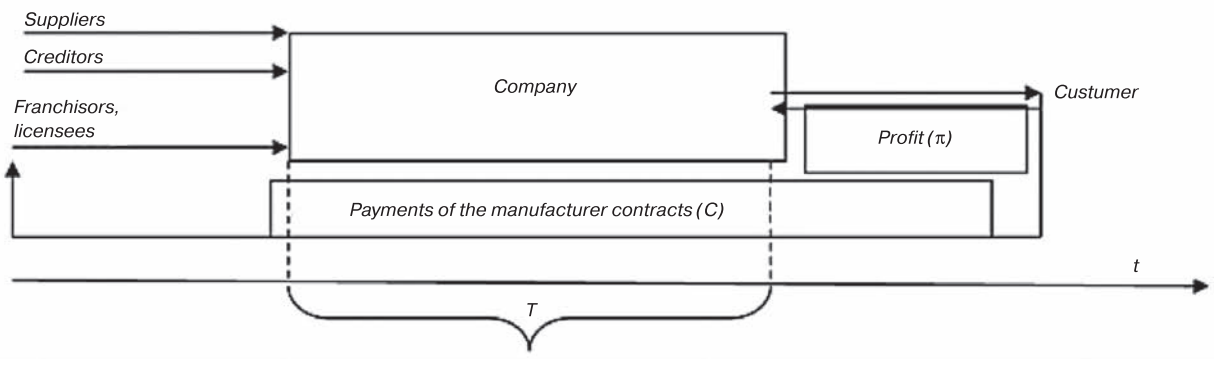

Fig. 1. The model of construction of major financial flows within the replenishment cycle of the company

development of shale and gas enterprises (USA), and biofuels (Germany) [9]. The Eurasian Union gives a chance to build new energy and infrastructure ties, taking into account the emerging opportunities.

The research made by the RAS has shown that [10], since 2012 in connection with the preparation for the establishment of an economic Union, the dynamics of import and export flows between member countries has dramatically changed, and it indicates the weakness and ambivalence of the established economic relations. For example, the Belarusian oil producers have reoriented mainly to the internal market of the Union at the expense of sharp reduction of deliveries to Third countries. Thus exponential growth for some items is observed: for example, deliveries on the article "Other hydrocarbon derivatives" (commodity group 2904) in Russia increased 8.3 times and the optimization of the structure of Russian and Kazakh oil producers was carried out.

The market of oil and oil products largely reacts to market fluctuations and contrary to earlier declared postulates, is not developed as a unified system yet. So, in the Agreement of 27 September 2005 [11] in accordance with article 3 it was planned to develop national fuel and energy balances and joint fuel and energy balance of the member countries of the Eurasian economic community on the principles of optimality of their structures. However, there was not substantial optimization and adjustment of trade relations after the entry of this document into force. At the same time, statements made by the leaders of the member countries, in particular in 2010, in connection with the cooling in relations between Russia and Belarus, led to a significant transformation of oil products that allows to make a conclusion about the low level of integration between the oil and gas sectors of the countries and the fragility of relationships.

An important factor, hindering the development of cooperation in the energy sector of the member countries, is the lack of single fundamental legal act in the field of energy in the countries. While existing normative legal acts, despite their effectiveness for the domestic market are often inconsistent with the spirit and interests of the Eurasian integration. In particular, for this reason it was decided to extend time limits of approval of the methodology of monitoring mechanisms for preventing violations of the terms of the agreement on the organization, management, functioning and development of common markets of oil and oil products of the Republic of Kazakhstan, the Republic of Belarus and the Russian Federation 09.12.2010 [12]. In the absence of certain and inviolable "rules of the game" residents of the member countries are forced to duplicate ties by the adapted to the current realities contracts. This approach will inevitably create a certain discrepancy between the logic of network of treaties and the logic of Eurasian economic relations. In addition, Soviet production ties, which are revived within the newly established Union, have significant drawbacks [13].

Although the reorientation of countries to the eastward has already realized since 2011 [12], but in full it cannot be realized in the existent infrastructure realities.

Steps to optimize the power infrastructure under the requests of the Eurasian Union with regard to the challenges of globalization have already been made. First of all, it concerns projects at the implementation stage [14].

The oil and gas sector is already attracting investments for the formation of a common Eurasian infrastructure (deviation of the variance from the average for the 15 years for the adaptation period is 25%), while in the electricity integration processes at the infrastructure level have not yet started. The reason for this lies in the following:

– lack of methodology, which allows uniquely to choose one of the long term projects distributed among the countries;

– lack of uniformity of criteria for selection of an energy project by the member countries of the Eurasian Union;

– lack of clear criteria of cost-effective distribution of profits between member countries.

Calculations show that only at the expense of the oil and gas market, in the case of the optimistic scenario of the development it will be impossible even to cover the domestic needs of the economy of the Eurasian Union, but without the introduction of new technologies the processing resources in one of the Union countries will be unprofitable in the next 10–15 years and will go to China [15]. Geopolitical issue is important when choosing the technological base of the general energetics. As noted by President Vladimir Putin in the article written for the newspaper "Izvestia", the Eurasian project should become "independent of the fluctuations of the current political and any other conditions". Consolidation of the economic interests of the leading decision-making centers around common Eurasian projects can become a tool, which provides such independence.

Development of methodology for implementation of the foresight research on the effectiveness of variants of network energy projects based on the model of "economic cross"

To realize the above mentioned steps it is necessary to develop a methodology for the finding and development of ties between industries, which are capable to form industrial "economic cross", involving all participants of the innovation process, starting with education [16]. An example of the technological process of the field of nuclear energy, requiring the use of "economic

cross", is the creation of "burial grounds", which do not produce economic benefits, as well as the development of innovative nuclear fuel. The problem with the financing of such plots is solved by preparation of strategic road map of the distribution of profits between the participants in accordance with the method of "economic cross" [17].

"Economic cross" of any manufacturing process is constructed as the intersection of resource and industrial cycles of this production. At that consumer value is created at the intersection of cycles and production costs are formed solely at the "ends". A model of economic cross in the nuclear power industry is as follows (Fig. 2):

Methodologically, the procedure of constructing of economic cross for the purposes of forming the unified innovative energy infrastructure within the economic space of the Eurasian Union includes the following steps.

1. Collecting of information about existing innovative energy projects.

1.1. Preparation of the list of projects of pan-Eurasian value (hereinafter – the Project), determination of their approximate structure and key criteria (Fig. 3).

1.2. Definition of elements for the realization of each Project, development of a system of minimum values of their critical parameters (holding period, risks and opportunities of the use of non-resident companies' capital etc.).

1.3. Collection of information about the companies, which are potential participants of the Project.

2. Direct preparation of the "road map" for each of the Projects.

2.1. Definition of possible ways of realization of the project by the method of "network planning" [18].

2.2. Calculation of the parameters of each of the possible ways taking into account the parameters of time and distance, finding possible variants of optimization by the adoption of new international agreements within the frameworks of the Eurasian Union.

2.3. Choice of optimal ways of realization, conduct of negotiations with potential participants about the distribution of profits, which generates at the intersection of "economic cross".

2.4. Optimization of constructed ways according to the method "Monte Carlo" with Pareto optimization [19] taking into account all possible requests from China and other partners of the Eurasian Union.

2.5. The formation of institutions, which provide for more effective implementation of Programs.

3. Realization of the chosen way and adjustment of programs.

Let us consider how the proposed methodology can be implemented in more details.

Currently, a significant part of production capacities of Russia and other countries of the Eurasian Union, as previously noted, is involved in "foreign" economic chains [20], that determine their indifference to the intellectual potential of the country: the

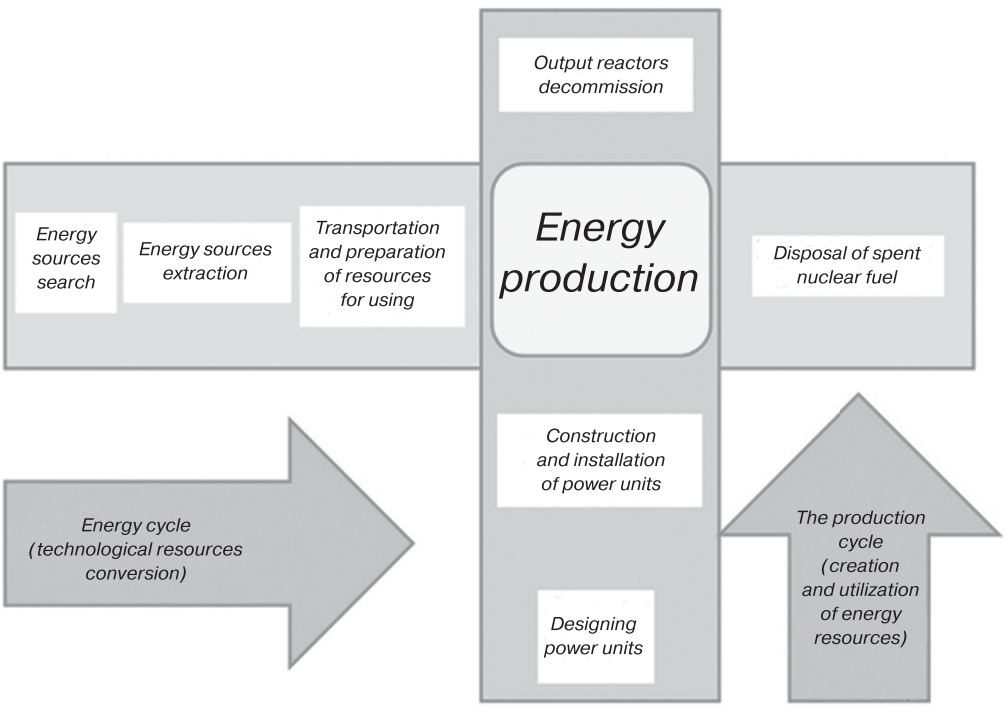

Fig. 2. The essence of the usage of method of "economic cross" in prediction of energy

Table 1
Evaluation criteria of the pan-Eurasian project (two-dimensional model)

Expected income of the economic system	Expected costs of the economic system		
	In a short period of time C_1	Medium term C_2	Long-term C_3
Enterprises (R_1)	$\pi_{1,1}$	$\pi_{1,2}$	$\pi_{1,3}$
Regions (R_2)	$\pi_{2,1}$	$\pi_{2,2}$	$\pi_{2,3}$
Countries (R_3)	$\pi_{3,1}$	$\pi_{3,2}$	$\pi_{3,3}$
Level of the pan-Eurasian project (R_4)	$\pi_{4,1}$	$\pi_{4,2}$	$\pi_{4,3}$
The EU level (R_5)	$\pi_{5,1}$	$\pi_{5,2}$	$\pi_{5,3}$

concept of the product is not developed by them. At the same time, there is the possibility of their reorientation to new technologies if a group of producers become autonomous in the context of access to the market outlet. As such market it is necessary to choose the market of product, the shortage or the price of which is one of the key problems from the list of the most relevant difficulties of the Eurasian economic community, composed by leading experts in this field [21]. The economic effect from the creation of each of such markets should be evaluated as follows (Table 1):

$$\pi_{i,j} = R_i - C_j,$$

$$\pi = \sum_{i=1}^{5}\sum_{j=1}^{3}\pi_{i,j}.$$

The resulting value π can be adjusted taking into account the probable synergetic effect. To calculate this value it is possible to use the methodology, which is described in the reference [22]. The expected effect for energy increases value up to 15%, in the nuclear industry this value supposingly can be higher. The second component of the growth π may be the geopolitical effect. Thus,

$$\pi_{\text{result}} = \pi + \Delta\pi,$$

where Δπ – synergetic effect.

At that it is possible to use different methodological approaches to the modeling of variants [23], using for value estimation different variants of behavior of stochastic parameters, which affect the value of the economic gains.

Conclusions

Thus, in this paper we present foresight research, the result of which is the proof of the necessity for development of a new system of economic relations between companies from countries of the Eurasian Union on the example of energy. We pointed out the causes for the inefficiency and inadequacy of the current ties for realizing the potential of the Eurasian Union in the energy sphere and also we pointed out the ways of modernization of these ties. The results of the analysis of the current conditions of development of interstate relations in the energy sector indicate the main directions of reforming of intergovernmental relations and offer a variant of the usage of developed and published by the authors methodology of "economic cross" on prediction and development of the system of economic relations in the innovative sector of the forming energy space of the Eurasian Union. The proposed methodology of the foresight analysis, which allow to consider the specifics and scope of Eurasian integration processes fully conform to the provisions of the new Federal law "About strategic planning in the Russian Federation" (172-FZ of 28 June 2014) and is one of the tools of its implementation.

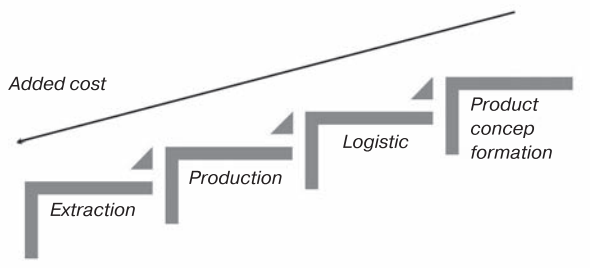

Fig. 3. Dynamics of the product added cost obtained by the contractor at different stages of raw material and production cycles within the frameworks of the model of "economic cross"

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