

Energy strategy of Russia for the period up to 2030: Eastern vector

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Eastern Siberia and Far East play the greatest geopolitical and socio-economical role for Russia. So ES-2030 pays special attention to Eastern vector, and four of five key strategic initiatives of Russian fuel and energy complex development directly touches upon the problems of long-term development of energy industry in Eastern region of Russia. They include: development of oil and gas complexes, development of hydrocarbon potential of the continental shelf of the Arctic seas and Northern territories of Russia, development and spatial diversification of energy infrastructure and development of non-fuel energy in Eastern regions of the country.

Key words: energy strategy of Russia, energy policy, Eastern vector, fuel and energy complex.

1. ENERGY STRATEGY 2030: FROM FORECASTS TO TARGET MODELING

Energy Strategy is the most important document that determines targets and objectives of Russian energy policy. Three Energy strategies were approved since the Russian Federation was found, and each of them plays its significant role in our country's life and make a valuable contribution to the development of methodology of strategic planning in energy sector of Russia.

So, the first Energy Strategy for the period up to 2010 proceeds from possibilities of energy complex and has mostly technological character. But the next Energy Strategy for the period up to 2020 became the first paper of complex character, that corresponds detailed forecast of energy sector development relating

to different scenarios of socio-economical development of the country.

Energy Strategy [1] for the period up to 2030 (after ES-2030) approved by decree № 1715-r of the Government of the Russian Federation dated 13 November 2009, is successive to previous documents, and bases on absolutely different approach that increases its sustainability even while the future is not clear. ES-2030 is not yet a forecast but target model of energy sector development, consciously chosen way with target indicators as landmarks the achievement of which will determine its real efficiency in the future.

Approved Strategy is not a document of direct action but a document for documents. It can not and should not substitute for programs (general schemes of branch and regions development, investment programs of branch and energy companies development), it sets priorities and guidelines that should other programs and strategic documents of less level coordinated with. Thus ES-2030 sets the framework of forming the field of interrelated strategic documents of different level that set the development of certain sectors and branches of energy industry, energy companies and regional programs.

The typical example of establishment of orderly constructed, interrelated system of strategic documents headed by the ES-2030 is mainly formed by today a set of program documents that define strategic development of energy sector in the East of the country up to 2030. It includes:

- Strategy of socio-economical development of the Far East and Baikal region up to 2025;
- Strategy of development of Eastern Siberia and the Far East up to 2030;
- Program of development of oil processing capacity in the regions of Eastern Siberia and the Far East;

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- the state-run Development Program for an integrated gas production, transportation and supply system in Eastern Siberia and the Far East, taking into account potential gas exports to China and other Asia-Pacific countries (Eastern Gas Program).

2. EASTERN VECTOR IN ES-2030: NEW SIDES OF “OLD” TASK

Development of energy sector in the East of the country was always one of the most important priorities of the Russian energy policy. Unfortunately up to the last moment East energy policy did not correspond with the geopolitical and socio-economical significance that Eastern Siberia and the Far East have for Russia.

Thus, wealthy resource potential of oil and gas fields of Eastern Siberia and the Far East is incompletely used, the system of oil and gas-chemical complexes is not created yet, there are difficulties with energy infrastructure development, export energy potential of the region is not used in full, unfavorable ecological situation still remains.

So that, ES-2030 assigns a special part to the Eastern vector of energy policy of Russia, which is fixed in every part of the Strategy: from the system of key indicators of implementation of the Strategy and strategic initiatives of energy sector development to the branch sector of strategic development of fuel and energy complex of Russia.

Thus, Road Map of implementation of state energy policy according to ES-2030 provides for:

- in the part of diversification of export energy markets (task №19) « Increase in the share of the Asia-Pacific countries in the structure of the Russian energy export to 16–17%.»;
- in the part of stimulation of production, export and domestic consumption of energy resources with high value added (task №10) « Implementation of a complex of program measures for petrochemistry and gas-chemistry development in the Eastern

Siberia and Far East.», that have crucial importance exactly for east regions of the country;

- in the part of development and increasing efficiency of human reserve in energy sector (task № 17) « Extended reproduction and attraction of human resources for development of new areas of the Eastern Siberia, Far East, Yamal Peninsula and continental shelf of the Arctic seas based on the following:
 - establishment of the system of specialized regional centers for specialists training in the fuel and energy complex;
 - provision of the entire social setting for the personnel in the difficult natural conditions of the new areas development, including rotational method through use of mobile systems of the social infrastructure».

Four from five key strategic initiatives of development of the fuel and energy complex of Russia indicated in the Strategy, directly touch the problems of long-term development of energy sector in the East of Russia.

Thus, development of oil and gas complexes in the Eastern regions of the country (the continental shelf of Sakhalin, the Republic of Sakha (Yakutia), the Magadan and Irkutsk Regions and the Krasnoyarsk Territory) and construction of appropriate industrial, transport and social infrastructure will lead to energy self-sufficiency of the stated regions as well as diversification of the Russian hydrocarbons export destinations at the expense of the countries of the Asia-Pacific region. Involvement of multicomponent hydrocarbon resources of the region into industrial development will promote petrochemical and gas chemical production, assist in advanced social and economic development of the Eastern Siberia and Far East. As a result, annual growth rates of gross regional product in the region will exceed average growth rates in the country by at least 0.5–1.5%..

development of hydrocarbon potential of the continental shelf of the Arctic seas and Northern territories of Russia in prospect after 2020 provides for the development of shelf of the East Arctic and reanimation of the Northern Sea Way. The last one under the conditions of the current climate changes and thawing of arctic ice can become a catalyst of development of Northern territories and water areas, and also one of the most important transport-energy artery that connects European Center and Eastern regions of the country.

Development and territorial diversification of the energy infrastructure provide for implementation of the most important infrastructural projects in the Eastern part of the country including the completion of ESPO pipeline, implementation of Eastern Gas Program, petrochemistry and gas-chemistry development in the Eastern Siberia and Far East.

Development of non-fuel energy provides for large-scale development of hydro energy in the East of the country in accordance with regional peculiarities of demand for electricity, as well as peculiarities of load pattern regulation and allocation of generating capacities of various kinds.

Including of new renewable energy resources (such as geothermal, solar, wind, bioenergy) in fuel and energy mix will allow to balance energy demand, decrease environmental pressure from energy plants to the environment and also provide the energy security in a set of hard-to-reach areas in Eastern Siberia and in the Far East.

3. THE EAST IS A KEY DIRECTION OF DIVERSIFICATION OF THE RUSSIAN EXPORT

National interests of Russia require stirring up its mutually beneficial energy cooperation with Japan, China, Korea and other countries of North-Eastern Asia.

Events of the latest years show that the Asia-Pacific Region becomes the most prospective market for Russian energy resources. In spite of the world economic crises the demand for

energy resources in this region continues its growth.

Thus, demand only on pipeline gas supply from Russia to the Asia-Pacific Region in perspective (China, Korea) accounts for 30-68 billion cubic meters. Deadlines of implementation of these projects are not yet defined because of the problem of price endorsement.

Potential of pipeline deliveries of Russian gas to the Asia-Pacific Region by 2020 can be estimated in advance within 25-50 billion cubic meters per year. By 2030 the potential of all gas deliveries (pipeline and LNG) to this region may be accounted for 60-90 billion cubic meters.

Oil market of the Asia-Pacific Region can be also characterized as rather prospective from the point of view of needs of the countries in additional oil deliveries volume including Russia. China probably remains the major importer of additional volume of Russian oil, but in prospect it is logical to expect the growth of demand of Japan, Republic of Korea etc.

Main prospects of further development of Russian coal export are also connected with the Asia-Pacific Region. The share of deliveries in the Asia-Pacific Region for the period from 2002 to 2009 increased from 13,7% up to 23,5% and reached 24,8 million tons. In 2009 export deliveries of Russian coal to China sharply rise up to 9,6 million tons while in 2008 they were accounts for 0,3 million tons. In whole volume of coal export in the Asia-Pacific Region may increase up to 56-60 million tons yet by 2015.

Chinese electricity market will remain one of the most prospective for Russian electricity export. Leading growth of demand (in comparison with China in whole) on electricity in north-eastern regions of this country verged on the RF will be connected with implementation of «Revival program of North-Eastern China» that was adopted in China in 2007. According to this program a considerable growth of machine building output, growth of oil refining and output of chemical and petro-

chemical industry are supposed to take place in North-Eastern regions of the China.

According to Eastern energy company (Russian operator of export to China), more than 1 billion kWh of electricity will be delivered to China in 2010. By 2014 volume of export deliveries in China may reach 7-10 billion kWh, by 2030 volume of export may increase up to 60-80 billion kWh.

Deliveries of electricity to the Republic of Korea probably will be able to start after 2015 and by 2030 can reach 10-15 billion kWh.

Thus, the Asia-Pacific Region in long-term prospect is the most perspective market for Russian resources. If take into account the wealthy resource potential of Eastern regions of our country it makes the task of diversification of export in Eastern direction one of the key task in the framework of ES-2030 implementation.

4. EASTERN VECTOR IN DEVELOPMENT OF BRANCHES OF FUEL AND ENERGY COMPLEX: OBJECTIVES AND PROSPECTS

ES-2030 takes into account Eastern vector also on the level of different sectors and branches of fuel and energy complex.

In framework of development of resource base it is provided for the formation of all necessary conditions (laws, taxes etc.) and then active development of resource base of fuel and energy complex in Eastern Siberia and in the Far East.

In Eastern Siberia, commercial development of oilfields is supposed in Vankorsko-Suzunskiy region in the north-western part of Krasnoyarsk Territory, along the route of oil pipeline Eastern Siberia – Pacific Ocean in Krasnoyarsk Territory, Irkutsk Region and the Republic of Sakha (Yakutia) (Verkhnechonskoye, Talakanskoye, Srednebotuobinskoye, Yurubcheno-Tokhomskoye and other oilfields).

In the Far East production facilities at projects “Sakhalin-1”, “Sakhalin-2” and others (the

continental shelf of the Sakhalin Island) will be operated.

In new regions of oil extraction the large oil plants will be created. They will combine an oil and oil associated gas production and processing enterprise with oil and gas-chemical production.

In development of oil transportation the most important goal is still the completion of ESPO pipeline building, the first turn was launched in December 2009.

Gas industry development up to 2030 provides for the formation of the large gas producing centers in the East of the country:

- the Sakhalin gas production center on the base of Sakhalin shelf zone deposits (projects “Sakhalin-1” and “Sakhalin-2”) with further development of the center at the expense of realization of projects “Sakhalin-3”, “Sakhalin-4”, “Sakhalin-5”, and “Sakhalin-6”;
- the Yakutia gas production center on the base of Chayandinskoye deposit with the opportunity for development of adjacent deposits – Srednebotuobinskoye, Taas-Yuryakhskoye, Verkhnevilyuchanskoye and others;
- the Irkutsk gas production center on the base of Kovyktinskoye deposit with the opportunity for development of Yuzhno-Kovyktinskaya license area and deposits of the north of the Irkutsk Region;
- the Krasnoyarsk gas production center on the base of Sobinsko-Paiginskoye and Yurubcheno-Tokhomskoye deposits with the opportunity for development of Omorinskoye, Kuyumbinskoye, Agaleevskoye and other deposits

Stage-by-stage construction of the gas pipeline system in the Eastern Siberia and Far East for the purpose of gas supply to the countries of the Asia-Pacific region, first of all, to the Republic of Korea and China, with the possibility of connection, should it be economically efficient, to the unified system of gas supply, will be performed in the context of implementing the program of the unified gas supply system formation in the Eastern Siberia and Far East.

LNG production will be developed on the basis of Sakhalin's deposits and its export in the countries of the Asia-Pacific Region, also the program of gasification of Eastern Siberia and the Far East will continue.

Construction of new gas processing and gas chemical complexes including in Eastern Siberia is planned to provide complex processing of hydrocarbon resources and output of products with high added value.

Coal mining development is contemplated in base basins - Kuznetsk and Kansk-Achinsk basins. Coal mining will be developed on new deposits in Eastern Siberia and the Far East (Urgalskoye, Egegestskoye, Elginskoye, Ap-satskoye deposits) on a medium and long-term basis alongside with base basins. Furthermore, should the economic efficiency be proved, coal mining can be developed in Bering coal basin (the Chukot Autonomous Area).

Taking into account that almost 90% Russian coal of export is provided by sea transport, the special logistic centers for providing trade with the countries of the Asia-Pacific Region will be constructed in the East of Russia, building of railway tracks to gain access to ports Vanino (Kuznezovskiy tunnel) and Vostochniy. According to the project of port capacity development of the Far East, the total capacity of the Far Eastern region's ports will be increase at least 1,5 times by 2015 and will account for 44 million tons.

Electric energy industry development in Eastern regions of the country will take into account that expected growth rates of electricity consumption in Eastern Siberia and the Far East are considerably higher than average over the country on the prospect up to 2030. According to Energy strategy, the electricity production in the East of the country will be based on the heat coal electric power plants with use of technologies "pure coal burning" and on hydropower plants..

Increase in electricity production in the Siberia and Far East will be determined by engineering and economic indicators and competitiveness of hydroelectric power plants com-

pared to thermal coal-fired power plants, their environmental impact and possibilities to cover load pattern. Potential to achieve the multiplicative effects of commissioning new hydroelectric facilities connected with creation on their base of industrial clusters – consumers of electricity, produced at hydroelectric power plants, will also be of great importance in these regions.

Development of the following large backbone hydroelectric complexes may become the principal direction of the abovementioned multiplicative effects achievement under the appropriate economic and environmental justification:

- Nizhneangarsk hydroelectric complex;
- South-Yakutia hydroelectric complex comprising several hydroelectric power plants on the rivers of Uchur, Timpton, Aldan and Olekma;
- Vitimsk hydroelectric complex;
- Nizhneeniseisk hydroelectric complex on the base of the Evenki hydroelectric power plants with the capacity of 12 million kW.

Electricity, produced at these hydroelectric complexes will be used for development of substantial local natural resources, creation of the regional mining and processing industries, and will be transmitted to the Urals, European part of Russia and industrial regions of the Siberia and Far East via electric power transmission lines of direct and alternate super high voltage current constructed for this purpose.

In heat supply development and using the renewable sources of energy and local fuel Energy strategy provides for active development of decentralized electric and heat supply in the East of the country, and in some hard-to-reach areas – with use of local fuel and energy.

5. FIRST RESULTS OF IMPLEMENTATION OF ES-2030 IN THE EAST: CAREFUL OPTIMISM

First results of implementation of Energy strategy for the period up to 2030 show that in

spite of economic crisis and a set of force majors such as accident on Sayano-Shushenskaya hydroelectric power plant or Russian-Ukraine gas conflict in winter 2009/2010, development of Russian fuel and energy complex in whole is fulfilled in course of aims and tasks of the Strategy [2].

The most significant results of implementation of state energy policy were seen exactly in the East of the country, including:

- growth in the share of Eastern Siberia and the Far East in oil production from 3% up to 4,6% (expectations for the end of the first stage of ES-2030* implementation – 10-12%);
- growth in the share of Eastern Siberia and the Far East in gas production from 2% up to 3,7% (expectations for the end of the first stage of ES-2030 implementation – 7-8%);
- growth in the LNG share in gas export from 0% up to 3,5% (expectations for the end of the first stage – 4-5%);
- growth in the share of the countries of the Asia-Pacific Region in the structure of gas export from 0% up to 3,5% (expectations for the end of the first stage – 11-12%);
- growth of capacity volume of coal sea ports terminal from 110% to 122% in comparison with the level of 2005 (expectations for the end of the first stage – 125%).

Thus, the main increase of oil production in the country was provided by operation of Vankorskoye (started in 2009), Verkhnechonskoye and Talakanskoye deposits of Eastern Siberia, and also by the completion of the construction of oil-pipeline infrastructure and supply of year-round operation of sea production objects in the project “Sakhalin-2”.

* According to adopted methodology, the implementation of the Energy strategy for the period up to 2030 provides for 3 stages. Expected time of the end of the first stage – 2013-2015; expected time of the end of the second stage – 2020-2022; expected time of the end of the third stage – 2030.

In December 2009 the first part of ESPO pipeline is placed in operation. It supplies the entry to the Asia-Pacific Region market for the oil of Eastern Siberia deposits.

Owing to launching in February 2009 the first plant in Russia for LNG production with the capacity of 9,6 million tons per year Russia starts its own production of LNG.

In the framework of implementation of Eastern Gas Program in July 2009 the gas pipeline “Sakhalin-Khabarovsk-Vladivostok” was started to construct. The first starting complex with the capacity of 6,5 billion cubic meters a year is planning to be placed in operation in third quarter of 2011.

In spite of the crisis 3 mines and 1 open-pit mine with the capacity of 7,5 million tons of coal per year and 3 coal preparation plants with the capacity of 9 million tons of coal per year were placed in operation. Adoption of the system of complex degassing of coal stratum and methane utilization for increasing security of coal processing has started in Kuznetsk Basin. Capacity rate of coal terminals in sea ports, such as Vostochnyi and Vanino, rises.

The budget expenditures on compliance of state’s commitments on the Russian coal industry restructuring in 2009 accounts for more than 19 billion rubles.

State supply of strategic initiatives on resource base of fuel and energy complex and energy infrastructure development continues owing to Investment fund’s money - particularly projects of complex development of Nignee Priangarie; complex development of South Yakutia; constructing of the railway Kyzyl – Kuragino; constructing the new Kuznetsovskiy tunnel in order to gain access to the ports Vanino and Sovetskaya Havan.

Strategy of development of electric energy industry in the Far East for the period up to 2020 is developed and endorsed with the power industry companies and the subjects of the Russian Federation of the Far Eastern federal district.

First-priority projects in electric energy industry in the East of the country are implemented

with the state support (faster reconstruction of Sayano-Shushenskaya hydropower plant, energy supply of first turn objects of ESPO pipeline, preparation for summit of APEC in Vladivostok in 2012 including the construction of wind-power plant with the capacity of 20 MW for energy supply of Russkiy Island).

6. CONCLUSIONS

In spite of careful optimism of the first results of ES-2030 implementation it is necessary to understand that the solution of the strategic tasks on the development of the East of Russia is not possible without the creation of the effective system of its realization and also without consistency of adopted strategic documents on the development of this region.

First results demonstrate that we are on the right way but the further advancement to the ES-2030 goals will require more efforts from the authorities in order to make the East vector one of the locomotives of development of Russian energy sector.

7. LITERATURE

[1] Energy strategy of Russia for the period up to 2030 (ES-2030), approved by Decree №1715-r of the Government of the Russian Federation dated 13 November 2009.

[2] Energy strategy of Russia for the period up to 2030: monitoring of its implementation in 2009 (Report in the Government of the Russian Federation).

8. BIOGRAPHIES

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- General director of the Institute of Energy Strategy (IES), Professor, Doctor of engineering, full member of Russian and International Academies of Engineer and Energy,

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