# The concept of integrated development hydrocarbons resources and reserves of the East of Russia

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*Abstract* - **One of the main priorities of Russia oil and gas industry - forming in Eastern Siberia and the Far East, the new centers of oil, gas, oil and gas processing, petrochemicals and gas chemicals, helium industry, the organization of commercially effective supply of oil and gas and products of deep processing of the Pacific market (in the country Asia-Pacific and the Pacific coast of the USA).**

**Since most of the hydrocarbon (HC) and the composition of license blocks in Eastern Siberia and the Far East are complex - contain both gas and oil, and petrochemical plants use natural and associated petroleum (PNG) gas and crude oil and condensate - in the formation of new centers of the oil industry in these regions, it is expedient to take into account the parameters of the gas complex.**

**Crude oil and condensate production in Eastern Siberia (including Vankor-Suzunsky zone) and the Far East could reach in 2015 some 79 million tons in 2020 - about 100 million tons, in 2030 - 119 million tons under favorable market and investment conditions of total gas production (dry gas energy and wet gas containing C2-C4) in the process of developing a gas-and oil fields in Eastern Siberia and the Far East could reach in 2015 to 55 billion cubic meters, in 2020 - up to 158 billion cubic meters, in 2030 - over 230 billion cubic meters.**

**When creating new centers of oil and gas industry in Eastern Siberia and the Far East and the organization of export deliveries of oil and gas from Russia it is expedient to ensure the maximum technologically and cost-effective extraction on Russian territory all the valuable and potentially valuable components, including ethane and propane-butane fraction, helium and other elements in accordance with their concentration. When the export of crude oil and natural gas energy, appropriate conclusion connected contracts involving the provision of access for Russian companies to the objects of transportation, processing and marketing in the territory of countries - recipients.**

*Index Terms* - **the reproduction of the mineral resource, oil and gas complex of Russia, Eastern Siberia, Far East**

## I. RESOURCES AND QUANTITATIVE REFERENCE POINTS OF PETROLEUM GAS AND CONDENSATE PRODUCTION ON REGIONS

One of the main priorities of development petroleum industry of Russia – formation in Eastern Siberia and in the Far East the new centers oil, gas, oil and gas processing, petrochemical, helium industries, the organization commercially effective supply of oil, gas, and products of their deep processing on the Pacific market (in the Asia Pacific countries and on Pacific coast USA).

The majority of deposits of hydrocarbons and license blocks of Eastern Siberia and the Far East contain both gas, and oil, and at the petrochemical enterprises are used natural and petroleum gases, and also oil and a condensate. In this connection at formation of the new centers of a petroleum industry in these regions it is expedient to consider and parameters of development of a gas complex.

In Eastern Siberia and in the Far East is from above 15 billion tons initial total resources of oil or more than 18 % from the Russia as a whole thus the share of undiscovered resources makes about 50 % that specifies in high perceptivity of carrying out geological survey; the reconnoitered reserve of oil exceed 1,2 billion tons.

In the East of Russia it is concentrated from above 54 trillion cubic meters and or about 21 % of initial total resources of gas to Russia, the identified reserves of macro region 4,9 trillion cubic meters or about 10 %. Degree of extent of exploration gas resources in Eastern Siberia and in the Far East of 8,6 and 11,3 % accordingly

that specifies in high perceptivity of new opening.

Initial total resources of a condensate in Eastern Siberia and in the Far East make nearby 3,3 bln. ton, the reconnoitered stocks of 220 million ton, degree of extent of exploration accordingly 6,3 and 7,9 %.

The oil production in Eastern Siberia (including the Vankoro-Suzunsky zone) and in the Far East can increase in 2015 to 75 million tone, in 2020 – to 95 million tone, in 2030 – to 112 million tone (Table 1).

TABLE 1.

OIL PRODUCTION IN EASTERN SIBERIA AND FAR EAST IN 2008-2009 AND THE FORECAST TILL 2030, MILLION TONS

| Region | 2010 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|
| The Eastern Siberia and Republic Sakha (Yakutia) | 19,5 | 58,0 | 72,3 | 76,9 | 81,2 |
| Krasnoyarsk region | 11,0 | 40,6 | 46,6 | 48,6 | 49,6 |
| The Irkutsk region | 4,4 | 10,9 | 12,8 | 13,6 | 14,2 |
| Republic Sakha (Yakutia) | 4,1 | 6,5 | 12,9 | 14,7 | 17,4 |
| The Far East | 16,7 | 17,5 | 23,4 | 28,9 | 31,4 |
| Sakhalin | 15,1 | 16,3 | 20,9 | 22,0 | 23,5 |
| Continental deposits of Sakhalin | 1,6 | 1,2 | 1,1 | 1,0 | 1,0 |
| The West Kamchatka shelf | | | 1,4 | 5,9 | 6,9 |
| In total | 36,2 | 75,5 | 95,7 | 105,8 | 112,6 |

Production of condensate connected, first of all, with working out of gas deposits can make in 2015 to 3,5 million tone, in 2020 – to 10,5 million tone, in 2030 – to 11,8 million tone. The part of an extracted condensate together with oil will be delivered on oil pipelines on domestic market and for export. Its other part of condensate will be used for needs of petrochemistry both on existing, and on projected petrogas-processing and chemical complexes (Gas Processing Plant and Chemical Complex in Nizhnia Poima, Sayansk, Khabarovsk; Oil Refinery in Khabarovsk and Vladivostok, etc.).

The general oil and condensate production will make in 2015 about 79 million tone, in 2020 – about 100 million tone, in 2030 – 119 million tone. Thus production of liquid hydrocarbons in Eastern Siberia and Republic Sakha (Yakutia) will make in 2015 60 million tone, in 2020 – 76 million tone, in 2030 – 87 million tone (Table 2). In the Far East this indicator will make in 2015 15 million tone, in 2020 – 21 million tone, in 2030 – 32 million tone.

TABLE 2.

OIL AND CONDENSATE PRODUCTION IN EASTERN SIBERIA AND FAR EAST IN 2008-2009 AND THE FORECAST TILL 2030, MILLION TONS

| Region | 2010 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|
| The Eastern Siberia and Republic Sakha (Yakutia) | 20,6 | 60,8 | 76,0 | 81,7 | 87,2 |
| Krasnoyarsk region | 12,0 | 42,6 | 49,1 | 51,5 | 53,1 |
| The Irkutsk region | 4,5 | 11,6 | 13,8 | 15,1 | 16,1 |
| Republic Sakha (Yakutia) | 4,2 | 6,6 | 13,1 | 15,1 | 18,0 |
| The Far East | 16,9 | 18,2 | 24,2 | 29,8 | 32,4 |
| Sakhalin | 15,3 | 17,0 | 21,7 | 22,9 | 24,5 |
| Continental deposits of Sakhalin | 1,6 | 1,2 | 1,1 | 1,0 | 1,0 |
| The West Kamchatka shelf | 0,0 | 0,0 | 1,4 | 5,9 | 6,9 |
| In total | 37,5 | 79,0 | 100,2 | 111,5 | 119,6 |

Under favorable marketing and investment conditions a total gas production (dry power gas and the fat gas containing C2-C4) in the course of working out both gas, and oil deposits in Eastern Siberia and in the Far East can make in 2015 to 55 billion cubic meters, in 2020 – to 158 billion cubic meters, in 2030 – to exceed 230 billion cubic meters (Table 3).

TABLE 3.

GAS PRODUCTION IN EASTERN SIBERIA AND FAR EAST IN 2008-2009 AND THE FORECAST TILL 2030, BLN. CUBIC METERS

| Region | 2010 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|
| The Eastern Siberia and Republic Sakha (Yakutia) | 9,4 | 22,1 | 111,8 | 143,7 | 148,6 |
| Krasnoyarsk region | 6,9 | 12,4 | 24,6 | 30,6 | 31,5 |
| The Irkutsk region | 0,5 | 5,5 | 34,0 | 54,8 | 56,8 |
| Republic Sakha (Yakutia) | 2,0 | 4,2 | 53,2 | 58,3 | 60,3 |
| The Far East | 22,6 | 33,5 | 46,6 | 60,2 | 84,2 |
| Sakhalin | 21,9 | 32,9 | 45,1 | 51,9 | 71,9 |
| Continental deposits of Sakhalin | 0,7 | 0,6 | 0,5 | 0,3 | 0,3 |
| The West Kamchatka shelf | | | 1,0 | 8,0 | 12,0 |
| In total | 32,0 | 55,6 | 158,4 | 203,9 | 232,8 |

The utilized passing gas which will be extracted, first of all, in the course of working out of oil deposits will be delivered or in gas-transport system with the subsequent processing on large gas processing and chemical plants, or to be used on a place. Recycling of passing oil gas on a place around a craft means its use in energy capacities for maintenance of needs of crafts, electric power delivery.

## II. PROSPECTS OF DEVELOPMENT OF A TRANSPORT INFRASTRUCTURE

### *A. Oil pipeline «Eastern Siberia – Pacific Ocean»*

The oil pipeline «Eastern Siberia – Pacific Ocean» (ESPO) is under construction (II turn) for oil transportation to the Russian Far East and on the markets of Asian-Pacific region. The system is technologically connected to existing main pipelines Transneft and will allow to create the uniform network providing operative distribution of streams of oil on territory of Russia in western and east directions.

Planned throughput ESPO – 80 million tons of oil a year. Extent of the line – over 4770 kilometres, a terminal point – new specialised sea oil port in a bay of Kozmino in Primorski region.

The first stage of building «Taishet – Skovorodino» (2757 km) is begun in April, 2006, finished in December, 2009.

Investments into building of a first stage of the pipeline (ESPO-1) taking into account indexation are estimated in 390 billion rub. (from above 13 billion dollars), for terminal building in Kozmino is spent 60 billion rub. (more than 2 billion dollars).

Since October 2008 till October 2009 a site of oil pipeline ESPO «Talakansky – Taishet» worked in return mode; oil of Talakansky and Verhnechonsky deposits was pumped over on a route «Taishet – Angarsk», further by rail to China and on Habarovky refinery plant that has allowed to increase extraction in Eastern Siberia in 2009 to 3 million tone.

In October, 2009 building of oil export terminal «Kozmino» – final point ESPO is finished. For an unloading of tanks the new station Cargo has been constructed. The station can unload to 720 tanks every day that does its by one of the specialised stations largest in the country. Oil from drain tanks will arrive at first in special tanks, and then to move on the 23-kilometre pipeline to moorings oil termanal «Kozmino». The total amount of technological oil necessary for functioning of port, – 85 thousand tons. In November, 2009 Transneft Eastern Siberia – Pacific ocean has finished filling with technological oil of objects of port in Kozmino and a first stage of an oil pipeline, and December, 2009 – shipment of oil to tankers is conducted.

After input of first stage ESPO in system oil from deposits of the Irkutsk region and Republic Sakha and oil from deposits of the Tomsk region and Hunts-Mansijsky autonomous region can be delivered. It is concluded a swap agreement about deliveries of 13 million tone oil from Samotlor deposite in ESPO, in exchange for deliveries of oil from Vankor deposite on Ryazan refinery plant.

Building of second turn ESPO by extent of 1963 km on a route of «Skovorodino – Kozmino» is planned for 2010-2012. Investments, including expenses for acquisition of technological oil – 354 bln. rbl. (from above 12 billion

dollars), including capital investments – 341 billion rub. (more than 11,7 billion dollars).

The exit of all system ESPO on a designed capacity in 80 million tons will occur consistently – in 2010 – 15 million tons, in 2011 – to 30 million tons, by 2016 – to 50 million tons, by 2025 – to 80 million tons of oil.

Since 2011 about 15 million tons of oil will be delivered on an oil pipeline – to tap to China. In October, 2009 Transnef» has finished building in territory of the Russian Federation of a linear part of tap to China. Now the Chinese contractor CNPC – company CPP has spent the inclined directed drilling on the river the Amur in a zone of underwater transition of branch from oil pipeline ESPO. The general extent of the pipeline on territory of China from the Amur to Datsin will make 960 km. On the Chinese party than 700 km of an oil pipeline are already constructed more.

For oil deliveries in ESPO from the Vankorskoro-Suzunsky zone and deposits Jamalo-Nenetsikj region and the Northeast of Hunts-Mansijsky by 2012 oil pipelines of Purpe – Samotlor and Polar – Purpe should be constructed.

In 2012-2015 expediently building near to the terminal in Kozmin» around Yelizarov's cape modern Primorski oil refinery plant capacity on 20 million raw materials tons in a year with the petrochemistry block.

*B. Gas pipelines*

The first stage – 2010-2015. The prime project on transportation of gas in the east of Russia is pipeline «Khabarovsk-Vladivostok» building. The period of realisation of the project - 2009-2011. In July, 2009 welding of the first joint of a gas pipeline has taken place. The pipeline will be connected to the operating gas-transport system «Sakhalin-Khabarovsk» which capacity will be expanded. The gas pipeline should provide gas supply of Vladivostok and gasification of Primorski Territory to summit Asian-Pacific Forum of Economic Cooperation in 2012. At the first stage (2011) capacity of a gas pipeline will make from 12 to 27.5 billion cubic meters a year with possible subsequent expansion to 100-120 billion cubic meters (2025). Investments into realisation of the first stage will make nearby 210 billion rub.

In 2010-2011 in frame of gasification of gasification of the Irkutsk region the gas pipeline «Chikansky deposit-Sajansk-Angarsk-Irkutsk» will be realised. Gas will be delivered to consumers in Sayansk, Angarsk, Irkutsk. Capacity of the pipeline on a site «Chikansky deposit – Sayansk» will make nearby 5,3 billion cubic meters with the subsequent increase to 24 billion cubic meters, on a site «Angarsk – Irkutsk» nearby 3 billion cubic meters. Extent of a gas pipeline «Sayansk-Chikansky deposit-Sajansk-Angarsk-Irkutsk» makes about 645 km.

Further, for a diversification of deliveries of gas from Eastern Siberia, optimisation of work of Uniform system of gas supply of Russia and its connections with East-Siberian and Far East the centres of gas production, strengthening of a trunk-call position with importers of gas in Asian-Pacific region expediently building of the main gas pipeline «Sayansk-Proskokovo». Term of realisation of the project – 2012-2015. Capacity of a gas pipeline will make from above 20 billion cubic meters. Gas in a projected gas pipeline «Sayansk – Proskokovo» will arrive, mainly with Kovyktinsky deposite; in 2015 it is necessary to carry out gas pipeline building «Kovyktinsky-Chikansky deposits». Capacity of a gas pipeline will make nearby 20-25 billion cubic meters.

In 2013-2016 gas pipeline building «Chajandinsky-Habarovsk-Vladivostok» is necessary. In 2016 gas from Eastern Siberia can arrive in gas-transport system of the Far East and further for export. Initial capacity of a gas pipeline will make nearby 36 bln. cubic meters with possible subsequent expansion to 64 billion cubic meters. Investment in the first stage will make nearby 400 billion rub. Delivery of gas from Yakutia to the Far East should be synchronized with building gas refinery and chemical plant in Khabarovsk and LNG factory in Vladivostok.

After the Yakut centre of a gas production is connected to a gas pipeline of the Far East connection of deposits of the Irkutsk region will be necessary. Building of the main gas pipeline «Kovyktinsky – Chajandinsky» is supposed.

Realization terms – 2016-2018. Capacity of a gas pipeline will make nearby 28 billion cubic meters; investments – nearby 110 bln rub.

Simultaneously it is necessary to spend gas pipeline expansion «Chajandinsky – Khabarovsk – Vladivostok» to 64 billion cubic meters. Main part of gas from the Kovyktinsky deposit will arrive for export, first of all, to China and Korea. It is supposed that branch to China can be created in area Skovorodino, Blagoveshchensk, Dalnerechensk; to Korea – on an underwater gas pipeline Vladivostok – Kannyn – Seoul, in long-term prospect after political settlement achievement on the Korean peninsula probably passage of an overland part of a gas pipeline.

After the termination of building of a gas pipeline which will connect the Irkutsk centre gas production and USG Russia, there will be a possibility of development of gas potential of Krasnoyarsk region. First of all at the expense of connection to a pipeline network of the Jurubcheno-Tohomsky zone. Gas pipeline building «Jurubcheno-Tohomsky-Boguchany-Nizhnia Pojma» and connection to a gas pipeline «Sayansk-Proskokovo» here is supposed. Realization terms – 2013-2015. Capacity of the pipeline on piece «Jurubcheno-Tohomsky – Boguchany» will make nearby 10 billion cubic m.

In 2015-2016 the gas pipeline «Jurubcheno-Tohomsky- Nizhnia Pojma» can be connected to a gas pipeline «Sobinsky-Boguchany» which will be connected to deposits of the Sobinsko-Pajginsky and Agaleevsko-Imbinsky zones. Capacity of the pipeline on a piece «Boguchany - Nizhnia Pojma » will make 17,5 billion cubic meters.

### *C. Underground Gas Storage*

In order to regulate the seasonal fluctuations of domestic consumption, as well as the supply of gas for export and reliability of gas supply in case of abnormally high temperature fluctuations and failures in the transmission system must create a system of underground gas storage (UGS).

According to Gazprom's demand for an active volume of gas underground storage (without long-term reserves) to the level in 2030 estimated at 5,9-6,4 billion cubic meters:

• consumer Eastern Siberia - 1.9 billion cubic meters;

• consumer Far East - 1.5 billion cubic meters;

• to regulate the supply of gas for export pipelines - 2,5-3 billion cubic meters.

As a first object the development of underground gas storage facility in the Irkutsk region is recommended gas storage in salt caverns near the city of Angarsk, which will fully ensure the southern regions of the Irkutsk region in storage capacity. To ensure the Krasnoyarsk and south of Krasnoyarsk region may create underground gas storage facility north of Achinsk. In the region of Khabarovsk, the most promising object is Malositinskaya structure. Prospects for increasing the active capacity of gas storage is also associated with areas adjacent to Malositinskoy structure.

## III. PROSPECTS FOR THE DEVELOPMENT OF REFINERY INFRASTRUCTURE

Natural gas in Eastern Siberia contains significant quantities of methane homologues, which are the raw material for petrochemicals. For refinery of gas in Eastern Siberia and the Far East should be the construction of three gas processing and petrochemical complexes. Gas from the fields in the Krasnoyarsk region will be processed at the refinery and the Petrochemical Complex in Nizhnia Pojma (Table 4). Gas from the fields in the Irkutsk region, delivered in Unified Gas Supply System (UGSS) (in the south and west directions), will be processed at Sayansk Gas Processing Plant (GPP) with block petrochemicals. Gas from the fields in the Irkutsk region, which would be transported through the Republic of Sakha (Yakutia) (in the north and east), together with the gas Chayandinskoye and adjacent fields, will be processed on the GPP and the Petrochemical Complex in the region of Khabarovsk.

The construction of gas processing plants in Khabarovsk to be synchronized with the supply

of gas from the Yakutsk gas production center and north of the Irkutsk region - up to 45 billion cubic meters in 2018 to start gas supplies to the Khabarovsk refinery from oil fields in the south of the Irkutsk region (Kovykta – Chikanskoye center). Shipments may be reduced to 28 billion cubic meters.

The output from the Khabarovsk refinery and Petrochemical Complex basic commodity products will be: energy gas, propane, butane, polyethylene, polypropylene, polyvinyl chloride, polystyrene and styrene copolymers.

TABLE 4

PROSPECTS FOR THE DEVELOPMENT OF GAS PROCESSING, OIL REFINING AND PETROCHEMICAL COMPLEXES IN EASTERN SIBERIA AND THE FAR EAST

| **Location** | **Type of production** | **Commissioning** | **Helium storage** |
|---|---|---|---|
| Khabarovsk | GPP | 2016 | Malositinskaya natural structure |
| | Petrochemical Complexes, Helium | 2017 | |
| Sayansk | GPP | 2015 | Atovskoe field |
| | Petrochemical Complexes, Helium | 2015 | |
| Nizhnyay Poima | GPP | 2015 | Artificial storage needs of the market |
| | Petrochemical Complexes, Helium | 2015 | |
| Vladivostok | RP, Petrochemical Complexes, LNG | 2016 | |

Based on the volume of raw materials, production energy of the gas can be brought in 2030 to 120 billion cubic meters, propane-butane - 1 million tons, polyethylene - 2.6 million tons, polypropylene - 2.4 million tons, polyvinyl chloride - 2,6 million tons, polystyrene and styrene copolymers - 1,7 million tons. If necessary, the plant will come condensate.

Given the parameters of gas production in the Irkutsk region, as well as the timing of construction of gas pipelines, in 2013-2015 necessary to build refinery and Petrochemical Complex in Sayansk. There will be processed gas supplied from the Kovykta field, which will continue to be sent to the UGSS, as well as small gas fields in the area. Expected to bring the volume of gas at Sayansk GPP 2030, 20 billion cubic meters.

Based on the volume of raw materials, production of dry energy gas can be reduced by 2030 to 19 billion cubic meters, propane-butane - 0.2 million tons, polyethylene - 0.51 million tons, polypropylene - 0.47 million tons, polyvinyl chloride - 0.51 million tons, polystyrene and styrene copolymers - 0.34 million tons in accordance with the technological conditions condensate will flow.

Based in the commissioning of deposits of Krasnoyarsk region, the parameters of building gas pipeline infrastructure, as well as the timing of construction of gas pipelines, in 2014-2015 necessary to build refinery and Petrochemical Complex in Nizhnia Pojma. Here is recycled gas coming from Yurubcheno-Tohomskogo, Sobinsko-Payginskogo and Agaleevsko-Imbinskogo gas production centers in the Krasnoyarsk region. Expected to incise the volume of gas at GPP in Nizhnia Pojma in 2030 to 17.5 billion cubic meters.

Based on the volume of raw materials, production energy gas can be brought in 2030 to 15.9 billion cubic meters, propane-butane - 0.23 million tons, polyethylene - 0.58 million tons, polypropylene - 0.54 million tons, polyvinyl chloride - 0.58 million tons, polystyrene and styrene copolymers - 0.4 million tons in accordance with the technological conditions condensate will flow.

## IV. THE ECONOMIC EFFICIENCY OF DEVELOPMENT OF DEPOSITS EASTERN SIBERIA AND FAR EAST

Summary of technical and economic indicators the Concept of integrated resource development and hydrocarbon reserves in Eastern Siberia and the Far East are listed in Table. 5.

TABLE 5.

TECHNICAL AND ECONOMIC INDICATORS OF DEVELOPMENT PREPARED FOR THE LICENSING

AND PROJECTED OIL AND GAS RESOURCES IN EASTERN SIBERIA AND FAR EAST

| Rate / Value | Total Eastern Siberia and Far East |
|---|---|
| Oil production, mln tons | |
| - only for the period | 1 822 |
| - maximum | 113 |
| Gas, billion cubic meters | |
| - only for the period | 2 670 |
| - maximum | 216 |
| Production of condensate, million tons | |
| - only for the period | 128 |
| - maximum | 10 |
| Number of wells to be drilling, unit | 4 659 |
| - gas | 1 560 |
| - oil | 3 099 |
| Revenues, mln. rub. | 42 757 158 |
| - gas | 22 490 553 |
| - oil | 18 600 861 |
| - condensate | 1 665 744 |
| Capital investments, mln. rub. | 4 746 046 |
| Operating costs, mln. rub. | 10 515 312 |
| Taxes, mln. rub. | 14 188 173 |
| - the federal budget | 8 010 940 |
| - regional budget | 1 008 960 |
| - in the local budget | 5 155 776 |
| - extra-budgetary funds | 12 497 |
| Net profit, mln. rub. | 21 240 774 |
| CCF, mln. rub. | 20 457 712 |
| NPV, mln. rub. | 3 889 670 |

## V. CONDITIONS FOR THE FORMATION OF EXPORTS

When creating new centers of oil and gas industry in Eastern Siberia and the Far East and the organization of export deliveries of oil and gas from Russia it is expedient to ensure the maximum technologically and cost-effective extraction on Russian territory all the valuable and potentially valuable components, including ethane and propane-butane fraction, helium and other elements in accordance with their concentration. Modernization of existing and formation of new centers of oil refining, gas processing, petrochemical and gas chemical industry in East Siberia and the Far East stimulating socio-economic development of Russian regions, will create products with high added value.

When the export of crude oil and energy gas, appropriate conclusion connected contracts involving the provision of access for Russian companies to the objects of transportation, processing and marketing in the territory of countries - recipients. It is advisable to form, controlled by Russian companies, especially Gazprom supply network and liquefied gas in the Asia-Pacific region, not only from Russia but from other regions of the world. Gazprom as a global energy company has the opportunity of entering the LNG projects in Asia-Pacific countries, the Pacific and the Atlantic Coast of the USA, organized by international and transnational corporations - BP, Shell, Exxon, Chevron, Total and others from different regions of the world according to the scheme of substitution (SWAP) in the European market, as well as in exchange for their admission to the projects in East Siberia and the Far East.

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## VII. BIOGRAPHIES

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Laureate of the Russian Federation in the field of science and technology (2003) and laureate of Kosygin Prize in science, technology and organization of production (2003). For a great contribution to the development of the extractive industry of Russia was awarded interdisciplinary sign "Miner's glory" (2008).

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Areas of research: the reproduction of the mineral resource and geo-economic evaluation of resources and reserves of oil and gas. Special studies are devoted to the analysis of the status and prospects of development of oil, gas and mixed by the type of fluid deposits and promising oil and gas exploration areas. Dealing with public management, sectoral, regional, corporate development, assessment of prospects for oil and gas processing, petrochemicals, including assessment of investment attractiveness of individual projects.

He is one of the authors of "The Strategy of Economic Development of Siberia" (2001), "Energy Strategy of Russia until 2020" (2003), "Energy Strategy of Russia until 2030" (2009). The author and coauthor of more than 90 scientific publications, including 7 monographs.

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Areas of research: geological and economic estimation of resources and reserve; analysis of a current state and prospects of development of oil and gas complex of Russia; analysis and the forecast of the world market of oil, oil products and gas, including the forecast of the international prices for oil, petroleum supply and demand and also substantiation of their deliveries, with detailed elaboration on the countries and regions; analysis oil refinery, gas processing and petro-chemistry; analysis of a current state and prospects of development of systems of oil and gas and products of their processing transportation in Russia and in the World with detailed elaboration on regions and the countries; analysis of investment projects in oil and gas complex; monitoring and the system analysis of activity of majors companies of Russia and the World; analysis of questions of energy safety.

He is one of the authors of "The Strategy of Economic Development of Siberia" (2001), "Energy Strategy of Russia until 2020" (2003), "Energy Strategy of Russia until 2030" (2009). The author and coauthor of more than 200 scientific publications, including more than 15 monographs ("European petroleum market. Strategy of Russia", 2007, " Petroleum supply of global economy ", 2006, etc.).