CREATION OF NEW GAS - EXTRACTION CENTERS IN RUSSIA IN THE TERRITORY OF EASTERN SIBERIA AND FAR EAST AND OUTLOOK FOR THEIR DEVELOPMENT

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ABSTRACT

Eastern Siberia and Far East are of strategic importance for Russia's prospective development in the 21st century.

Russia's Eastern regions occupying a considerable part of the Russian Federation's territory (10.34 million km²) are characterized by extremely low density of population, which is merely 11% (16.4 million people) of Russia's total population. Small population and its outflow are the most vulnerable region's factors as Eastern Siberia and Far East will experience growing demographical pressure from actively developing adjoining states, above all, China.

Besides, all the industrially developed countries of the Asian-Pacific region – Japan, Republic of Korea and to an ever-increasing extent - China will be all the more dependant on the imported sources of raw materials, mainly hydrocarbons, in the first half of the 21st century. In this connection the next few decades will see the period of growing competition among the Chinese People's Republic, Japan, Republic of Korea and, in part, USA to gain access to the resources of Eastern Siberia and Far East. The first signs of the competition one can see today.

The region's gas industry has not developed much yet in spite of the fact that the Eastern Siberia and Far East potential is about 20% (60 trillion cubic meters) of Russia's initial total gas potential.

At present favorable preconditions have arisen to start forming new gas industry centers of all-Russian importance in Eastern Siberia and Far East and extending the Unified gas-supply system eastward. These pre-conditions are primarily related to considerable gas reserves growth in the last few years in the Irkutsk and Sakhalin regions, the Sakha Republic (Yakutia), Krasnoyarsk Territory, including Evenki Autonomous Area. The gas proven reserves totaling 4.7 trillion m³ by C₁ category and 3.2 trillion m³ by C₂ category provide for gas production up to 200 billion m³ by 2030.

Western Siberia and Far East are holding a home market with great potential which will be enlarging due to the region's social and economic development. Natural gas demand in 2020 and 2030 is forecasted to be no less than 25 and 30 billion cubic meters, respectively. Own gas resources allow to fully meet the region's needs for the period under review. Also, there is a great potential for gas supplies from Eastern Siberia and Far East to the Unified gas-supply system (up to 35 billion m³/year) and for export (up to 50 billion m³/year in 2020).

By now various scenarios have been developed for gas industry development in Eastern Siberia and Far East of which the most economically sound has been chosen.
Creation of Russia’s New Gas Production Centers on the Territory of Eastern Siberia and Far East and Prospects of their Development

D.V. Lyugai, R. O. Samsonov

Eastern Siberia and Far East are of strategic importance for Russia’s development prospects in the 21st century.

Russia’s Eastern regions occupying a great part of the Russian Federation’s territory (10.34 million sq. km.) are characterized by low density of population, which accounts for 11 % of Russia’s population (16.4 million people). At the same time, however, the regions have all necessary prerequisites for stable social and economic development.

The industrial production of Eastern Siberia and Far East accounts for 7.1 % and 6.0 %, respectively, of Russia’s gross domestic product. The region predominates in All-Russian output of a number of industrial products. So, Eastern Siberia provides 30 % of the All-Russian non-ferrous metal production and 17 % of the country’s timber and paper products. Non-ferrous metallurgy, gold and diamond mining and food industry are considerably developed in Far East. The region has the All-Russian military-industrial complex centers.

The economy of Eastern Siberia and Far East is characterized by high power-consumption of the gross industry production. In industrial areas of Eastern Siberia the economy’s power consumption exceeds All-Russian level by 38 %.

Industrially developed countries of the Asian-Pacific region (APR) – Japan, Republic of Korea and ever increasingly China will be dependent on the imported raw materials, above all, hydrocarbons in the first half of the 21st century. Thereupon, the next few decades will see growing competition between PRC, Japan, Republic of Korea and partly USA for the resources of Eastern Siberia and Far East. The first evidence of this struggle one can see even today.

Integrated development of the region’s hydrocarbon resources and entry in the energy markets of the APR countries will favor stronger Russia’s positions in this strategically important world region.

Until the present time the development of the Eastern regions’ fuel and energy complex was based on coal and hydropower industries. Gas industry in this region has not been well developed yet, though as a whole the initial gas potential of Eastern Siberia and Far East is estimated at 64 tcm (Table 1).

Table 1 Gas resources distribution according to the RF Siberian and Far Eastern Federal districts

<table>
<thead>
<tr>
<th>Federal districts</th>
<th>Initial raw material resources (IRMR)</th>
<th>Production from start of development</th>
<th>Extent of exploration,%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siberian</td>
<td>35,569.3</td>
<td>29.2</td>
<td>7.1</td>
</tr>
<tr>
<td>Far Eastern</td>
<td>13,795.1</td>
<td>83.8</td>
<td>9.9</td>
</tr>
<tr>
<td>Total on land</td>
<td>49,364.4</td>
<td>113.1</td>
<td>7.9</td>
</tr>
<tr>
<td>Total on sea shelf</td>
<td>14,954.8</td>
<td>0.064</td>
<td>5.8</td>
</tr>
<tr>
<td>Total on land and sea shelf</td>
<td>64,319.2</td>
<td>113.064</td>
<td>7.4</td>
</tr>
</tbody>
</table>

In order to enhance the socio-economic development in Eastern Siberia and Far East, to improve the region’s economics structure due to manufacture of new advanced technology products with high share of added cost the appropriate power base must be developed in the region. Gas
industry may become one of the sources of economic growth, by stepping up the industry general technological level (machine building, metallurgy, chemical and petrochemical industries, construction industry and production of building materials, etc.) and raising the competitiveness of the finished products. Presence of appreciable amounts of valuable components such as helium, ethane, propane, butane and heavy hydrocarbons in the gas of the Eastern Siberian and Far Eastern deposits makes it possible to set up a big high-technology subindustry – gas processing and gaschemical production with extensive nomenclature of valuable products in Eastern regions.

At present, favorable conditions have arisen for new All-Russian gas industry centers to start forming and for Unified gas supply system to expand eastward. These conditions are caused by a considerable gas reserve addition in the country’s eastern regions – in Irkutsk and Sakhalin districts, Krasnodar territory and Republic of Sakha (Yakutia) on the territory of which major fields holding unique gas reserves are discovered – Kovyktinskoye, Chayadinskoye and deposits on the Island of Sakhalin sea shelf.

Considerable reserves (cumulative recoverable gas reserves in the country’s eastern regions are estimated at 8 trillion m³) and the prospective Eastern Siberian and Far Eastern natural gas resources make possible to form new gas production centers in this region. Production capabilities of these centers are based on the available proven reserves of the unique major fields, and also on reserve addition by actively conducting exploration work in the Eastern regions.

Available experience in Russia’s gas industry development demonstrates that the base fields holding huge proven reserves by developing which the planned gas production capacity may be achieved in the long-term prospects is the basis for reliable gas supplies. Small fields holding not great reserves and located close to the base fields or along the gas main route should be used to compensate gas extraction decline for a short period of time or, sometimes, to regulate production.

Assessment of the region’s gas production capabilities shows that the Eastern Siberian and Far Eastern deposits are capable of insuring a yearly gas output amounting to over 200 billion m³, which indicates an increasing importance of the Eastern regions in the country’s gas balance.

To create a gas supply system in Russia’s Eastern regions and provide for a single export channel with the entrance to the APR countries’ market, it is suggested to organize industrial gas production centers on the basis of the base fields containing great gas reserves of recoverable categories, which insures maintenance of the predicted production capacities.

The below gas-condensate (GCF) and oil-gas condensate (OGCF) fields are under consideration as the base fields:

- hydrocarbon fields on sea shelf of Island of Sakhalin (projects “Sakhalin-1-2” and promising Blocks –3-9);
- Chayadinskoye OGCF (Republic of Sakha (Yakutia));
- Kovyktinskoye GCF (Irkutsk district);
- Sobinsko-Paiginskoye and Yurubcheno-Tokhomskoye OGCF (Krasnoyarsk territory).

On the basis of the base fields in Russia’s Eastern regions it is advisable to create the following territorial industrial gas production centers.

1. Sakhalin gas production center – on the basis of the shelf zone fields of Island of Sakhalin (projects “Sakhalin-1-2”) with subsequent development of the center through realization of the projects “Sakhalin-3-6”.

2. Yakutsk gas production center – on the basis of the Chayadinskoye field, the center development will depend on the neighboring fields development – Srednebotuobinskoye, Tas-Yuryakhskoye, Verkhnevlilyuchanskoye, etc.

3. Irkutsk gas production center – on the basis of the Kovyktinskoye field, the center development will depend on the neighboring fields development – Dulisminskoye, Markovskoye, etc.
4. Krasnoyarsk gas production center – on the basis of the Sobinskoye-Paiginskoye and Yurubchenskoye-Tokhomskoye fields; in future, Qmorinskoye, Kuyumbinskoye, Agaleevskoye and other fields may be involved in development to maintain the gas production levels.

There is a promising home market in Eastern Siberia and Far East. The market will be growing, as social and economic development of the region will be proceeding. Demand for natural gas in 2010 and 2030 is predicted at no less than 12 and 26 billion m3, respectively. The available own gas resources will entirely permit meeting the region’s gas demand for the period under review.

The region’s production capabilities will ensure meeting the natural gas requirements within the next 30 years, while at the same time, a considerable potential may be built up for gas deliveries from Eastern Siberia and Far East to Unified Gas Supply System and for export.

Presently, prepared is “Program to create a unified system of production, transportation and supply of gas in Eastern Siberia and Far East taking into account possible gas export to the markets of China and other countries of the APR region. The Program is worked out in line with the decree of the Russian Federation government. The Program proposes an integrated approach to the development of the Eastern Siberian and Far Eastern gas resources in compliance with the objectives of the social and economic development of the region and country on the whole.