The Eastern Vector of Russian Energy Strategy: Prospects of Russian Energy Resources Supply to the Markets of Asia Pacific Region

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What this presentation will show?

1. Current state and main indices of Russia’s energy sector
2. The Eastern vector - a strategic direction in Russia’s energy development in the first half of the 21st century
3. Initial conditions, targets and strategic directions in energy development in East Siberia and the Far East of Russia
4. Gas and Oil Supply to APR: Russian Perspectives
5. Cooperation between Russia and APR countries in other energy areas
6. Conclusions
1. Current state and main indices of Russia’s energy sector
### ROLE OF ENERGY SECTOR IN THE ECONOMY OF RUSSIA

<table>
<thead>
<tr>
<th>Indices</th>
<th>Energy sector share, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Years</td>
</tr>
<tr>
<td></td>
<td>2000</td>
</tr>
<tr>
<td>Industrial production volume</td>
<td>47.5</td>
</tr>
<tr>
<td>Gross domestic product</td>
<td>13.0</td>
</tr>
<tr>
<td>Tax proceeds to the federal budget</td>
<td>40.0</td>
</tr>
<tr>
<td>Export</td>
<td>52.6</td>
</tr>
<tr>
<td>Investment in fixed assets</td>
<td>25.7</td>
</tr>
</tbody>
</table>
The Russia’s Role in Ensuring Global Energy Security

- *Russia holds 18.2% of the world’s proved coal reserves, 21.4% of its proved natural gas reserves, 5.3% of its proved oil reserves, 14% of its uranium ore reserves*

- Russia produces (as of 2012):
  - Coal - 353 million t
  - Oil - 518 million t
  - Natural gas - 654 billion m³

- Russia is the largest exporter of fuel and energy products
## EXPORT OF RUSSIAN ENERGY RESOURCES (2010)

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>Quantity</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>20 billion kWh (0.1%)</td>
<td></td>
</tr>
<tr>
<td>Coal</td>
<td>116 million t (12%)</td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td>200 billion m³ (21%)</td>
<td></td>
</tr>
<tr>
<td>Oil</td>
<td>247 million t (13%)</td>
<td></td>
</tr>
</tbody>
</table>

 (%) – share in the world trade

12% – steaming coal share in the world trade

7% – coking coal share in the world trade

## Export of Fuel and Electricity from Russia in 2010

<table>
<thead>
<tr>
<th>Fuel and electricity</th>
<th>Export, total</th>
<th>Including export to the APR countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil, mln. t</td>
<td>247.0</td>
<td>38.0 (15.4%)</td>
</tr>
<tr>
<td>Oil products, mln. t</td>
<td>132.0</td>
<td>11.8 (8.9%)</td>
</tr>
<tr>
<td>Gas, bln. m³</td>
<td>200.0</td>
<td>13.3 (6.7%)</td>
</tr>
<tr>
<td>Coal, mln. t</td>
<td>116.0</td>
<td>28.0 (24.1%)</td>
</tr>
<tr>
<td>Electricity, bln. kWh</td>
<td>20.0</td>
<td>1.1 (5.6%)</td>
</tr>
</tbody>
</table>
2. EASTERN VECTOR - A STRATEGIC DIRECTION IN RUSSIA’S ENERGY DEVELOPMENT IN THE FIRST HALF OF THE 21ST CENTURY
National interests of Russia require intensification of its mutually beneficial cooperation with Japan, China, Korea and other East Asian countries.

Creation of new energy centers in East Siberia and the Far East will increase energy security of Russia, restore and strengthen broken fuel and energy ties between the regions and solve many important federal, interregional and regional problems.

Creation in the East of Russia and in the East Asian countries of a developed energy infrastructure in the form of interstate gas and oil pipelines and transmission lines will decrease the cost of energy carriers, enhance reliability of energy and fuel supply to consumers in different countries and make it easier to solve the environmental problems.

Russia needs a sound, scientifically grounded strategy for economic and energy cooperation with the East Asian countries. Eastern regions of Russia - East Siberia and the Far East - with their mighty economic and energy potentials underlie the implementation of Russia’s interests in this strategically important world region.
EASTERN ENERGY POLICY AS AN INSTRUMENT FOR SOLVING URGENT PROBLEMS IN RUSSIA

Eastern energy policy of Russia, as part of Eastern economic policy, is not an end in itself, but an instrument for solving many principally important problems of federal, interregional and regional levels.

General problems

1. Social – increase of comfort, style, quality of people’s life in the eastern regions of Russia
2. Political – consolidation and integration of the RF entities, strengthening the unity of the economic and energy space of RF
3. Geopolitical – reinforcement of Russia’s positions in the world economic system, in the community of APR, Central and Northeast Asia countries
4. Economic – enhancement of the efficiency of functioning and competitiveness of the economy in the East of Russia, increase of provision with resources and accessibility to the remote areas of the country, expansion of active economic space of Russia, creation of conditions for attraction of foreign investments and advanced technologies, etc. to Russia

Energy problems

1. Improvement of adaptability and reliability of energy and fuel supply to consumers
2. Increase of energy and environmental security of the country and regions
3. Perfection of territorial and production structure of Russia’s energy sector and particularly in its eastern regions
4. Formation of transport and energy infrastructure in Russia’s East – oil and gas pipeline systems, transmission lines– and creation of common transport and energy space in Russia, etc.
3. INITIAL CONDITIONS, TARGETS AND STRATEGIC DIRECTIONS IN ENERGY DEVELOPMENT IN EAST SIBERIA AND THE FAR EAST
ROLE OF ENERGY SECTOR OF EAST SIBERIA AND THE FAR EAST IN RUSSIA (AS OF 2010)

### Indices

<table>
<thead>
<tr>
<th>Indices</th>
<th>Russia</th>
<th>Total for East Siberia and the Far East</th>
</tr>
</thead>
<tbody>
<tr>
<td>Territory, min. km²</td>
<td>17.1 *</td>
<td>10.3 (60.2%)</td>
</tr>
<tr>
<td>Population, min. people</td>
<td>142.9</td>
<td>14.5 (10.1%)</td>
</tr>
<tr>
<td>Gross Domestic Product, trln. rub</td>
<td>32.1</td>
<td>3.3 (10.3%)</td>
</tr>
</tbody>
</table>

#### Potential of resources:

- Hydro, bln. kWh: 1660 (100%)
- Coal, bln. t: 274 (40%)
- Oil, min. t: 19013 (15%)
- Natural Gas, bln. m³: 65825 (12%)

#### Production:

- Electricity, bln. kWh: 1637 (18.8%)
- Heat, min. Gcal: 1355 (13.7%)
- Coal, min. t: 317 (37.2%)
- Oil, min. t: 505 (7.3%)
- Natural Gas, bln. m³: 649 (4.8%)
- Oil Refining, min. t: 249 (11.4%)

Russia completed the work on preparation of a large number of policy documents determining the strategic development of the economy and energy in the East of the country until 2030 in the context of energy cooperation between Russia and EAST Asia countries, such as "Energy Strategy of Russia until 2030", "Program for Creation in East Siberia and the Far East of a Unified System of Gas Production, Transport and Supply with Potential Gas Export to the Markets of China and other APR Countries" (Eastern Gas Program), "Strategy of Socioeconomic Development of the Far East and the Baikal region until 2025", "Strategy of Socioeconomic Development of Siberia until 2020", "Energy Development Strategy of East Siberia and the Far East until 2030", "Program for Development of Oil Refining Capacities in East Siberia and the Far East", etc.

These documents suggest a considerable increase in mutually beneficial supplies of Russian energy resources to the markets of China, Japan, Korea, and other East Asian countries.
Main projects (by ESI SB RAS)

In the framework of the Energy Strategy of Russia 2030 (ordered by the Ministry of Energy of RF)

- The strategy for energy development in East Siberia and the Far East until 2030
- The study on prospects for electric power industry development in Russia until 2030

Ordered by the regional authorities (Governments of the RF entities)

- The concept of reliable operation of energy facilities and energy security of Sakhalin region until 2020 – ordered by Administration of Sakhalin region
- The strategy for energy development in Amur region until 2010 and for the time horizon until 2030 – ordered by Administration of Amur region
- The strategy for electric power industry development in Chukot Autonomous Area until 2020 – ordered by Administration of Chukot AA and JSC “Chukotenergo”
- The strategy for energy development in Irkutsk region until 2015-2020 and for the time horizon until 2030 – ordered by the Government of Irkutsk region
- The energy strategy of Sakha Republic (Yakutia) until 2020 and for the time horizon until 2030 – ordered by the Government of Sakha Republic (Yakutia)
1. In the coming 15-20 years Russia will be unable to intensively develop untouched territories of East Siberia and the Far East. Therefore, it is most important to preserve and strengthen the existing economic potential for future development.

This can be achieved by implementing the so-called strategic scenario of economic development in these regions.

The strategic scenario of economic development in the Eastern regions suggests that their economy should quantitatively and qualitatively approach the current level of advanced European countries. The rates of economic growth in the considered regions should be higher than on average for Russia and the share of these regions in the total population number of the country should also rise.
2. Energy development in East Siberia and the Far East for the considered time horizon will aim not only to meet their demand for energy carriers but also to export Russian energy resources to the energy markets in the East Asian countries.
### POSSIBLE EXPORT OF ENERGY RESOURCES FROM RUSSIA

<table>
<thead>
<tr>
<th>Indices</th>
<th>2010 fact.</th>
<th>Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2015</td>
</tr>
<tr>
<td>Export, mln. tce., total</td>
<td>826</td>
<td>916-928</td>
</tr>
<tr>
<td>including:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oil, mln. t</strong></td>
<td>247</td>
<td>229-239</td>
</tr>
<tr>
<td>Eastern direction</td>
<td>38</td>
<td>39-40</td>
</tr>
<tr>
<td><strong>Gas, bln. m³</strong></td>
<td>200</td>
<td>266-287</td>
</tr>
<tr>
<td>Eastern direction</td>
<td>13</td>
<td>20-25</td>
</tr>
<tr>
<td><strong>Coal, mln. t</strong></td>
<td>116</td>
<td>120-125</td>
</tr>
<tr>
<td>Eastern direction</td>
<td>28</td>
<td>30-35</td>
</tr>
<tr>
<td><strong>Electricity, bln. kWh</strong></td>
<td>20</td>
<td>21-25</td>
</tr>
<tr>
<td>Eastern direction</td>
<td>1.1</td>
<td>4-8</td>
</tr>
</tbody>
</table>

Source: Substantiating materials to “The Energy Strategy of Russia until 2030”, Estimations of the author
4. GAS AND OIL SUPPLY TO APR: RUSSIAN PERSPECTIVES
PROSPECTIVE GAS PRODUCING CENTERS IN EAST SIBERIA AND THE FAR EAST

Total reserves $C_1 + C_2 = 9054$ billion $m^3$

Krasnoyarsk center reserves $C_1 + C_2 = 1380$ billion $m^3$

Yakutia center reserves $C_1 + C_2 = 2386$ billion $m^3$

Irkutsk center reserves $C_1 + C_2 = 4026$ billion $m^3$

Sakhalin center reserves $C_1 + C_2 = 1262$ billion $m^3$

Russian oil and natural gas resources become more and more attractive in the markets of APR and NEA countries as a result of increasing investment and other risks in the Middle East.
Oil and natural gas markets for the Russian consumers in the East of Russia will be relatively limited:

- Potentialities of oil and natural gas production are many times higher than domestic demands
- Reliability of oil and natural gas supplies from the eastern regions of Russia to APR and NEA countries is very high
Natural gas of the Siberian platform is unique in the content of helium and ethane, which essentially increases its consumer value.

Natural gas of the Siberian platform contains more than 0.3% of helium and 5-7% of ethane.

Helium reserves in the gas fields of the Siberian platform are estimated at 8.6 billion m$^3$, or above 30% of the world helium reserves.

In the future Russia can be the world largest helium exporter.
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Helium reserves in the gas fields of the Siberian platform are estimated at 8.6 billion m$^3$, or above 30% of the world helium reserves.

In the future Russia can be the world largest helium exporter.
At present the necessity to deliver not only hydrocarbon resources, but products of their advanced processing with higher value added to the international markets is clearly recognized at all levels in Russia. For this purpose it is planned to increase in the eastern regions of Russia output of oil products and create gas-chemical industry, whose products are in rather high demand in Russia and in NEA countries.
The Russian government, regional authorities and companies have started large-scale development of energy resources in the East of the country.
PROSPECTS FOR NATURAL GAS SUPPLIES TO THE MARKET OF APR COUNTRIES

Source: V.P. Timoshilov, FIEF-2011
The explored and indicated reserves of Evenki AO and the south of Krasnoyarsk krai – 696 million t. Crude oil resources – 45 million t/year

The explored and indicated reserves of Irkutsk oblast and the Southwestern Yakutia – 677 million t. Crude oil resources – 22 million t/year

SCHEME OF THE MAIN OIL PIPELINES IN THE EAST OF RF, INCLUDING OIL REFINING INFRASTRUCTURE

Previous Route

- Oil field
- Oil refinery
- Oil shipment terminal

Pipelines

- Existing
- Under construction
- Laid

Pipe diameter

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5. COOPERATION BETWEEN RUSSIA AND ASIA PACIFIC COUNTRIES IN OTHER ENERGY AREAS
(1) Large-scale electricity export from East Siberia and the Far East
POTENTIAL DIRECTIONS OF CROSS-BORDER TRANSMISSION LINES TO NEA
POSSIBLE LARGE-SCALE ELECTRICITY EXPORT FROM RUSSIA TO CHINA
(60-70 bln. kWh of electricity in 2020-2025)
(2) Export of Russia’s coal
DISTRIBUTION OF PROVED COAL RESERVES OVER THE TERRITORY OF RUSSIAN FEDERATION

Proved reserves, total 193.3 bln. t (100 %)

- European part: 10.1
- Eastern Siberia: 35.1
- Western Siberia: 44.3
- Far East: 10.5
## RETROSPECTIVE DYNAMICS OF RUSSIAN COAL PRODUCTION AND EXPORT, MLN T (IN ROUND FIGURES)

<table>
<thead>
<tr>
<th>Index</th>
<th>2001</th>
<th>2005</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>270</td>
<td>300</td>
<td>329</td>
<td>300</td>
<td>323</td>
</tr>
<tr>
<td>Export, total, including:</td>
<td>48</td>
<td>80</td>
<td>102</td>
<td>97</td>
<td>116</td>
</tr>
<tr>
<td>Eastern direction, total</td>
<td>6.5</td>
<td>15.2</td>
<td>16.6</td>
<td>27.7</td>
<td>28.0</td>
</tr>
<tr>
<td>including:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>5.4</td>
<td>9.8</td>
<td>9.0</td>
<td>9.0</td>
<td></td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>0.5</td>
<td>3.2</td>
<td>6.6</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>0.1</td>
<td>0.5</td>
<td>0.1</td>
<td>13.1</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>0.1</td>
<td>-</td>
<td>0.2</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>0.4</td>
<td>1.7</td>
<td>0.7</td>
<td>0.7</td>
<td></td>
</tr>
</tbody>
</table>

*For information: The supplies of Russian coal to China from January to October 2012 made up 15 million t, including: by sea – 12 million t, by railway – 3 million t.*

SCHEME OF RUSSIAN COAL TRANSPORTATION TO THE NEA MARKETS

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mln. t</td>
<td>14</td>
<td>28</td>
<td>30-35</td>
<td>35-40</td>
<td>45-50</td>
</tr>
</tbody>
</table>
6. CONCLUSIONS
Perspective energy development in East Siberia and the Far East till 2030 requires huge investments. The estimated cost of such a strategy is $200-250 billion, $80-85 billion should be invested in development of oil and gas production and main oil and gas pipelines (only for new energy enterprises).

This strategy of energy development in East Siberia and the Far East will probably not be realized without attraction of foreign investments. This is the specific feature of Russia as a player in the energy markets of NEA countries.
II. FIVE REQUIREMENTS FOR MUTUALLY BENEFICIAL COOPERATION IN THE FIELD OF ENERGY

1. Political will and serious intentions of participants to implement a specific energy project mutually beneficial for each country.

2. Coordination of economic and energy policy between the central, regional authorities and business of the countries in development of inter-country energy projects.

3. Comprehensive and system estimation of consequences (effects) of implementation of large-scale interstate energy projects, particularly under high uncertainty of future development, economic risks and global challenges for the countries, regions and energy companies.

4. Generation of mutually acceptable mechanisms for implementation of interstate energy projects (organizational, economic, legal and other mechanisms).

5. Development and implementation of the interstate projects by the international team (at all the stages: from feasibility study and design works to their realization).
THE NECESSITY TO ELABORATE AN INTEGRATED SCIENTIFICALLY GROUNDED STRATEGY OF ENERGY DEVELOPMENT IN THE NORTHEAST ASIA COUNTRIES TAKING INTO ACCOUNT IMPORT OF RUSSIAN ENERGY RESOURCES HAS BECOME URGENT

- Currently the main outlines of the energy cooperation in NEA are clear enough. The resource base of countries supplying energy resources and the energy markets of consuming countries have been properly studied. Intensive attention should be paid to the implementation mechanisms of coordinated actions of participants (countries, regions, companies) in terms of economic, legislative and other initiatives aiming to implement large-scale interstate energy projects.

- Energy companies and their research Institutions in Russia and in the NEA countries should stimulate the work in this direction in order to make an appropriate contribution to solution of the problem significant for all the countries of the regions.
Thank you for your kind attention