«Energy Saving in Natural Gas Distribution and Utilization in the Russian Federation»

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Russia
Topics discussed in presentation

- Role of natural gas in fuel and energy balance of Russia
- Energy saving in natural gas distribution
- Energy saving in natural gas utilization
- Main activities of OAO Promgaz and OAO Regiongazholding in the area of energy saving
- Regional energy saving projects implemented by OAO Promgaz and OAO Regiongazholding
- Energy saving projects in regions of Russia
Role of natural gas in fuel and energy balance of Russia
Specific Features of Russian Fuel and Energy Balance

- Large share of gas in the fuel and energy balance compared with other fuels due to its low price.
- High depreciation of capital assets causes considerable loss of energy resources during transportation and results in their inefficient utilization.
- High potential for energy saving in the area of distribution and utilization of energy resources.
Dynamics of Russian Fuel and Energy Balance

1990

- Gas: 42%
- Oil: 29%
- Coal: 20%
- Hydropower stations, nuclear power stations: 7%
- Others: 2%

2002

- Gas: 52%
- Oil: 27%
- Coal: 10%
- Hydropower stations, nuclear power stations: 7%
- Others: 4%
## End-user Prices for Gas (European vs. Russian)
*(quoted in EURO/1000m3)*

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>MAX.</th>
<th>MIN.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>121,99</td>
<td>297,44</td>
</tr>
<tr>
<td>Spain</td>
<td>113,30</td>
<td>231,71</td>
</tr>
<tr>
<td>France</td>
<td>58,82</td>
<td>225,32</td>
</tr>
<tr>
<td>Ireland</td>
<td>133,50</td>
<td>204,09</td>
</tr>
<tr>
<td>Italy</td>
<td>134,02</td>
<td>256,01</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>147,06</td>
<td>175,45</td>
</tr>
<tr>
<td>Austria</td>
<td>151,92</td>
<td>280,56</td>
</tr>
<tr>
<td>Portugal</td>
<td>114,83</td>
<td>273,40</td>
</tr>
<tr>
<td>Finland</td>
<td>115,35</td>
<td>262,40</td>
</tr>
<tr>
<td>Danemar</td>
<td>157,29</td>
<td>277,24</td>
</tr>
<tr>
<td>Sweden</td>
<td>178,26</td>
<td>343,22</td>
</tr>
<tr>
<td>Great Britain</td>
<td>106,65</td>
<td>192,07</td>
</tr>
<tr>
<td>Europe</td>
<td>58,82</td>
<td>343,22</td>
</tr>
</tbody>
</table>

* EUROSTAT data
Fuel and Energy Balances: comparison between Europe and Russia

Russia

- Oil: 27%
- Gas: 52%
- Coal: 10%
- Hydropower stations, nuclear power stations: 7%
- Others: 4%

Europe*

- Oil: 42%
- Gas: 25%
- Coal: 15%
- Hydropower stations, nuclear power stations: 15%
- Others: 3%

*Eurostat data
Energy saving in natural gas distribution
# Structure of Russian Gas Distribution Networks

<table>
<thead>
<tr>
<th></th>
<th>Length of gas distribution networks, thousand kilometers</th>
<th>Number of gas distribution organizations</th>
<th>Gas sales volume, billion cubic meters.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total in Russia</strong></td>
<td>502,3</td>
<td>318</td>
<td>251,7</td>
</tr>
<tr>
<td><strong>Gazprom</strong></td>
<td>380,6</td>
<td>195</td>
<td>147,5</td>
</tr>
<tr>
<td>including</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Regiongazholding</strong></td>
<td>295,5</td>
<td>161</td>
<td>102,5</td>
</tr>
<tr>
<td><strong>Other Russian organizations</strong></td>
<td>121,7</td>
<td>123</td>
<td>104,2</td>
</tr>
</tbody>
</table>

![Pie chart showing the distribution of gas distribution networks in Russia, with Gazprom comprising 76% and Others comprising 24%.]
Problems faced by gas distributors in Russia

- Depreciation of capital assets of gas distribution companies exceeds 50%.
- Only 10% of households using gas have gas meters installed.
- Gas distributors are poorly equipped.
- Existing tariffs for gas distribution are too low to cover distributors’ costs of repair and maintenance of gas distribution networks.
Main energy saving activities in gas distribution

- Improvement of gas consumption metering and control systems designed for consumers.
- Development of diagnostics techniques, methods of leak detection, prevention and elimination of leaks.
- Modernization of locking arms and handling equipment.
- Reduction of gas inputs needed for manufacturing and other technological purposes.

Experts believe that there exist good prospects for the reduction of gas losses in distribution networks (by 5-10% of total volume of gas distributed)
Energy saving in natural gas utilization
Gas Consumption in Russian Federation
(by type of consumers)
Russian Laws on Energy Saving

- Special Federal Programme “Energy-efficient Economy” (designed for 2002-2005 and up to 2010).
Potential for gas saving in gas distribution

- 37-39 billion m$^3$/year of gas can be saved by implementing energy saving measures at the consumer level, including up to 18.6 billion m$^3$/year to be saved in the power generation industry, further 3.2 billion m$^3$ can be saved by metallurgical enterprises, up to 6.0 billion m$^3$ can be saved annually in the residential sector.

- Gazprom potential in energy saving is 7-9 billion m$^3$/year, with the bulk of savings to be achieved at the level of high-pressure main gas pipe lines.

- Total saving potential of Russia is estimated at 44-48 billion m$^3$ per year.
Major Energy Saving Activities in Gas Utilization

1. Optimizing structure of regional fuel and energy balances in Russia, particularly through a targeted and rational policy in energy saving.

2. Increasing the efficiency of gas utilization through:
   - Co-generation of heat and electricity at small gas-fueled cogeneration plants;
   - Reduction in gas losses across the “production-transport-consumption” chain;
   - Introduction of energy saving technologies and equipment (particularly designed for gas saving).
   - Switching from gas consumption metering to energy consumption measuring.
Main activities of OAO Promgaz and OAO Regiongazholding in the area of energy saving
OAO Promgaz at glance

- Leading scientific, research, planning and design center of Gazprom in the field of gas distribution, utilization and regional energy systems.

- OAO Promgaz incorporates a scientific research institute, a design and analytical center, factory for the manufacturing of gas-utilization equipment, four representative offices in regions of Russia.

- Founded in 1949

- Major shareholder – Gazprom

- Company’s annual is USD 26 mln.

- Promgaz is a rapidly growing company. Its turnover in 2000-2002 increased fourfold.
OAO Regiongazholding at glance

- Established in 2000 to operate gas distribution networks owned by Gazprom.
- Principal shareholder of the company is Mezhregiongaz, a subsidiary of Gazprom.
- The company holds stocks of 161 gas distributors (out of total 318 in Russia). Out of these the company has controlling stock in 50 gas distributors and a blocking stock in 47 distributors.
- Length of gas distribution networks operated by OAO Regiongazholding is 295,5 thousand km. The annual sales of gas to end-users is 102.5 billion cubic meters.
Regional energy saving projects implemented by OAO Promgaz and OAO Regiongazholding
Investment Projects in the Astrakhan Region (energy saving)

- The projects were initiated by Gazprom and the Astrakhan Region Administration.
- Energy-saving projects implemented by OAO Promgaz.
Design of gas distribution networks in the region and development of efficient gas use market.

Establishment of unified market for energy resources. Development of small-scale heat and electricity production (small cogeneration plants).

Energy audit of end-users and development of investment proposals aimed at increasing the efficiency of power utilization.

Integrated projects on modernization, construction repairs and maintenance of life-support systems (jointly with the Russian Defense Ministry).
Establishing of High Energy Efficiency Demo Zone in the Town of Kalyazin of the Tver Region.

- The project was initiated by Gazprom and the Tver Region Administration.
- The investment project is being implemented by OAO Promgaz jointly with Ruhrgas.
Project “Kalyazin”
(High Energy Efficiency Demo Zone)

- Assessment of the existing fuel and energy balance structure of the town of Kalyazin.
- Market research of energy resources market.
- Developing solutions for rehabilitation of existing systems of heat and power supply.
- Developing gas supply system for Kalyazin.
- Advising on proposed changes in investment, price and tax policies designed for the project on supply of gas to the town of Kalyazin.
- Preparation of the pre-feasibility study.
Potential Gas Saving Projects in Russia

- Energy audit of gas consumers in Russia with intent to establish energy saving opportunities and develop integrated solutions for efficient use of energy resources. This includes:
  - development of measures for increased efficiency of use of energy;
  - preparation of project and technical documentation;
  - supply of equipment;
  - servicing.

  The implementation of the project can help achieve an average 50% in gas savings.

- A series of measures for diagnostics of gas distribution networks and assessment of losses of gas during distribution. Once implemented the project will help develop a planned schedule of measures designed to reduce losses of gas. The expected gas saving effect is up to 10%. 