Major Ways of Improving Energy and Fuel Use Efficiency in the Russian Federation

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Issues for Consideration

- Consumption of fuel and energy resources in the Russian Federation
- Energy saving potential
- Energy saving projects of JSC Gazprom promgaz
- Major ways of enhancing efficiency of the fuel and energy use
Consumption of Energy Resources in the Russian Federation and EU Countries

- Consumption of energy resources in the Russian Federation and biggest energy consuming countries of the EU (2007)

<table>
<thead>
<tr>
<th>Year</th>
<th>Primary Energy (mln. toe)</th>
<th>Natural Gas (mln. toe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>647</td>
<td>320</td>
</tr>
<tr>
<td>2001</td>
<td>669</td>
<td>327</td>
</tr>
<tr>
<td>2002</td>
<td>656</td>
<td>331</td>
</tr>
<tr>
<td>2003</td>
<td>674</td>
<td>342</td>
</tr>
<tr>
<td>2004</td>
<td>683</td>
<td>350</td>
</tr>
<tr>
<td>2005</td>
<td>697</td>
<td>357</td>
</tr>
<tr>
<td>2006</td>
<td>719</td>
<td>369</td>
</tr>
<tr>
<td>2007</td>
<td>729</td>
<td>375</td>
</tr>
</tbody>
</table>
Major influences on the GDP energy intensity in 2000 – 2007:

- Structural changes in the economy - approximately 70%
- Organizational and technical measures – approximately 30%

Structure of primary energy consumption by fuel type

- Natural gas: 51%
- Oil: 22%
- Coal: 14%
- Other: 13%

Structure of boiler and furnace fuels consumption by the branches of economy

- Power Industry: 43%
- Municipal: 15%
- Industrial sector: 17%
- Raw materials: 5%
- Population: 19%
- Other: 1%

Structure of natural gas consumption by the branches of economy

- Power Industry: 40%
- Municipal sector: 8%
- Industrial sector: 30%
- Population: 11%
- Other: 11%
According to the Russian Energy Strategy technically feasible energy conservation opportunities amount to some 300 mln. tonnes of oil equivalent nationwide.
## Potential Gas Saving

<table>
<thead>
<tr>
<th>Branches of Industry and economy</th>
<th>Natural gas saving potential</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mln. m³</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>109 714</td>
</tr>
<tr>
<td>Electric power industry</td>
<td>46 198</td>
</tr>
<tr>
<td>Industry, total, including:</td>
<td>31 248</td>
</tr>
<tr>
<td>- oil and gas industry</td>
<td>8 822</td>
</tr>
<tr>
<td>- metallurgical industry</td>
<td>8 556</td>
</tr>
<tr>
<td>- agrochemical industry</td>
<td>5 196</td>
</tr>
<tr>
<td>- cement industry</td>
<td>2 176</td>
</tr>
<tr>
<td>- defence industry</td>
<td>453</td>
</tr>
<tr>
<td>- petrochemical industry</td>
<td>1 965</td>
</tr>
<tr>
<td>- ministry of Defence</td>
<td>221</td>
</tr>
<tr>
<td>- machinery for agriculture</td>
<td>705</td>
</tr>
<tr>
<td>- agricultural industry</td>
<td>3 154</td>
</tr>
<tr>
<td>Communal and household consumption</td>
<td>12 095</td>
</tr>
<tr>
<td>Residential sector</td>
<td>9 385</td>
</tr>
<tr>
<td>Other consumers</td>
<td>10 788</td>
</tr>
</tbody>
</table>

### Expected natural gas conservation structure

- **Direct economy**: 35 mln m³, 32%
- **Economy of heating and electric power**: 45 mln m³, 41%
- **Substitution of other fuels**: 30 mln m³, 27%
JSC Gazprom promgaz Energy Saving Projects

- General schemes of organizing gas supply and distribution in 73 regions of the Russian Federation
- Energy strategies of the Russian Federation regions
  - Moscow energy strategy up to the year of 2025
- Feasibility study of reconstructing the St. Petersburg energy supply system
- Reconstruction of heating facilities in the Russian Federation regions (including construction of some 100 boiler houses in 2003-2008)
- Energy efficiency projects in cooperation with foreign partners and international organizations
  - Establishing of a high efficiency demo-zone in Kalyazin, Tver region, in partnership with E.ON Ruhrgas (Germany)
  - Study on Gas Saving to Reduce Natural Gas Demand and Enhance Energy Security implemented together with UNECE
  - Development of the energy saving implementation frameworks for the Russian Federation as exemplified by the Kaluga Region carried out jointly with Gasunie (the Netherlands)
  - Strategy study on inter-fuel substitution implemented in the Kolpashevo municipality, Tomsk region, prepared together with UNECE
Implementation of Energy Saving Policy in the Development of General Schemes of Gas Supply and Distribution

1. Energy audit of gas consumers
2. Assessment of energy saving potential
3. Preparation of top-priority energy saving measures list
4. Shaping of rational fuel and energy balances
5. Substantiation of expected gas consumption allowing for energy saving implementation

Development of proposals on institutional mechanisms of energy saving

- Pricing and tariff policy
- Development of gas saving investment support mechanisms
- Development and improvement of the legal and regulatory frameworks
- Creation of efficient gas saving inducement mechanism

Assessment of purchasing power of the major gas consumers
Energy Efficiency in Development of the Moscow Energy Strategy

- Development of combined heat and power generation (CHP), minimization of condensate output
- Upgrading and development of operating CHP plants based on steam and gas unit application
- Constructing gas turbine CHP plants on the basis of operating boiler houses
- Optimization of turbines heat performance by re-directing boiler-houses summer heat load to CHP plants
- Minimization of gas and electricity counter flows between Moscow and the Moscow Region
- Further modernization of fixed assets, improvement in maintenance and operation

Natural gas consumption forecast until the year of 2025

Natural gas saving
Development of the Frameworks for Energy Savings in the Russian Federation on example of the Kaluga Region

- Analysis of the Dutch practices of energy saving and efficient use
- Identification of energy saving opportunities at the Kaluga Region enterprises:
  - Making a list of enterprises, where energy expenses account for a considerable share in the production cost of the goods manufactured
  - Identification of 3 pilot enterprises—Kalugaputrmash, Kondrovo paper company, Teploservice
  - Implementation of energy audits
  - Recommendations on improving efficiency of energy and fuel use
- Development of stakeholders’ cooperation frameworks
  - Making a model for assessing economic efficiency of energy conservation inducing measures
  - Establishing a scheme of stakeholders’ interaction
- Development of proposals on improving energy conservation and efficient use legislation

Complex model

- Organizational structure
- Economic stimuli
- Administrative methods
Major Ways of Enhancing Efficiency of Fuel and Energy Use in the Russian Federation

- Improvement of legal and regulatory framework in the field of energy saving
- Improvement of pricing policy in fuel and energy complex
- Development of a system of economic and tax inducement of energy efficiency
- Development of financial mechanisms and credit policy and state support for energy saving projects
- Development and implementation of new energy saving technologies and equipment
- Development of ESCOs
- Energy saving policy awareness facilitating through mass media
- Gas pricing and gas supply regulation for various consumers depending on the efficiency of gas use
- Use of schemes which guarantee return of investments and their profitability
- Benefits and subsidies to socially unprotected customers
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