Long-term energy scenario use and development in Russia

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IRENA 2nd webinar series on national experience in long-term energy scenario (LTES) use and development

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Development of scenarios. Inclusion of climatic factors in the strategic planning system.

- Climate policy documents become a part of a hierarchical strategic planning system.
- At the same time, environmental goals do not dominate strategic planning. They are (and will be) always harmonized with the goals of stable economic growth, ensuring the country’s energy and economic security.
- The documents defining the energy sector development are formed in accordance with long-term forecasts of economic development (taking into account the implementation of national goals of low-carbon development in Russia and in other countries, their impact on the export of Russian resources and goods).
- The integrated parameters of energy sector development are determined by the Energy Strategy.
- Technologically (and regionally) detailed plans for separate energy industries are carried out in special long-term development forecasts (General Schemes of the industry development).

<table>
<thead>
<tr>
<th>National security strategy</th>
<th>Environmental safety strategy</th>
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<tbody>
<tr>
<td>Energy security doctrine</td>
<td>Climate doctrine</td>
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<td>Economic security strategy</td>
<td>National strategy for the socio-economic development with a low level of greenhouse gas emissions until 2050</td>
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<td>Long-term forecast of the socio-economic development of the Russian Federation</td>
<td>National Energy Strategy</td>
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<td>Forecast of scientific and technological development of the Russian Federation</td>
<td>Electric power sector long-term development plan</td>
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<td>Spatial development strategy of the Russian Federation</td>
<td>Gas sector long-term development plan</td>
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<td>Oil sector long-term development plan</td>
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<td>Coal sector long-term development plan</td>
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Development of scenarios. Interaction between the long-term economic and energy scenarios

**Ministry of Economic development**
- Macroeconomic parameters
- Energy efficiency (excl. energy sector)
- Low-carbon transformation of the national economy

**Analytical and modelling support**
- Russian Academy of Sciences
- Independent consulting groups and institutes

**Ministry of Energy**
- Energy sector development and transformation of the energy balance structure
- Energy export and the security of domestic energy supply
- Technological forecasting in energy sector (incl. storage, hydrogen, CCUS, etc)
- Long-term plans for the power sector development (incl. RES and NUC)
- Long-term plans for the fuel supply industries development

**Analytical and modelling support**
- Russian Academy of Sciences
- Independent consulting groups and institutes
- Engineering/design institutes (corporate or industry level)

**National strategy for the socio-economic development with a low level of greenhouse gas emissions until 2050**
- Does not include detailed quantified scenarios
- Formulates the priorities and key measures
- Strategy provisions MUST be accounted (and grounded in figures) in the long-term economy and energy forecasts

**Long-term forecast of the socio-economic development of the Russian Federation**
- Key macroeconomic parameters by 2-3 scenarios for 15 years
- International trade (incl. energy export)
- Forecast of sectoral structure pf GDP
- Changes in the regional structure of the economy

**Electric power sector long-term development plan**
- Long-term (15-20 years) integrated forecast of energy sector and projected energy balances are developed as a ground for the Energy Strategy targets.
- Economic requirements (investments, prices and taxes)
- Long-term economy forecasts are used as a basis for the energy demand projections
- Regional electricity and heat demand projection and capacity requirements based on the long-term economy forecast
- Cost and performance data of generating technologies, screening analysis based on LCOE
- System-wide least-cost optimization of generating capacity and electricity production mix by zones of national power system (IPS)
- Economic requirements (investments, prices and taxes)
Use of scenarios. Economic rationale for LTES. Harmonizing energy and economy scenarios

Long-term national economy development scenarios

Long-term energy sector development scenarios

Optimal changes in resource, technological and regional structure of energy supply industries, incl. electric power sector

Cumulative economic impact on:
- GDP and state budget
- Regional development
- Employment
- End-use prices and inflation
- Development of related industries (equipment suppliers, etc.)

Energy policy implementation measures

- Investments' support
- Taxation
- Competitive pricing and tariffs
- Standards and technical regulation
- Transformation of domestic energy markets

Energy sector totally
Electric power sector
# Use of scenarios. Enhancing of their credibility and acceptance

<table>
<thead>
<tr>
<th></th>
<th>Regular scenario elaboration</th>
<th>Expertise of results</th>
<th>Alternative scenarios</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Ministries and other government bodies,</td>
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<td>Rare</td>
<td>Harmonization between departments and different levels of government. Working groups, incl. experts</td>
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<td>regional authorities</td>
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<td>Scientific organization and institutions</td>
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<td>Discussion of the approaches, tools and results. Development of scenarios beyond the official forecasts.</td>
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<td>Independent consulting groups and</td>
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<td>Russian Parliament</td>
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Scenario capacity building. Who develop scenarios?

- Ministry of Energy has no its own in-house modelling capacity
- Russian Energy Agency (Minenergo subsidiary) provide statistical and analytical support
- For the long-term scenario development, distributed modeling resources from different organizations are used
- The configuration of modelling teams depends on the type of forecast (Energy strategy, or separate energy industries plans)
- The closer cooperation and coordination with modeling teams developing long-term economy forecasts is very desirable

Key modelling tasks in the long-term energy forecasts

- Modelling of international energy markets: prices and competitiveness of Russian energy resources
- Modelling of domestic regional (!) energy demand based on the macroeconomic forecasts
- Technological forecasting and evaluation of changes in the interfuel and technological competition
- Modelling of optimal energy supply structure (by regions and energy resources/carriers)
- Modelling of domestic energy markets and projection of prices
- Projection of financial requirements for the LTES implementation and its macroeconomic consequences
«SCANER» is a tool for the system analysis of the Russian energy sector development for the mid- and long-term prospects (to 2030-50) as an important part of national economy and global energy markets. Integrating the powerful modeling and informational resources, SCANER provides:

- Unique informational support to the analysis and forecasts (regularly updated databases on the national and regional economy, energy sector, energy balances and markets)
- Multi-level co-ordination system of energy forecasts focused on the formulation of rational scenarios of the economy, energy sector and energy companies' development
- Huge flexibility and fast adaptation of the models and their calculation modes under the separate forecasting requirements
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Thank you for attention!