The Hydro-electric Power Industry of Russia
Medium-term development strategy of JSC RusHydro

La Malbe, Canada,
4 June, 2008
Reform of the electric power industry of Russia: initial data

Private property (excluding Rosenergoatom, RusHydro) and Market regulation

Government property and Government regulation

Competitive sectors
- Generation
- Electricity sales

Monopolistic sectors
- Dispatching
- Transmission grids
- Distribution grids
Reform of the electric power industry of Russia: results

**COMPLETED**

- The reform of Russia’s electric power industry is complete
- Thermal power generation has been privatised
- Liberalisation of the electric power market is in full swing and will be complete by 2011

**TASKS CURRENTLY BEING TACKLED**

- Launch of the capacity market
- Launch of the system services market
RusHydro: the biggest generating segment and the leader in developing renewable energy sources

- Russia’s biggest generating company and first in the world among publicly-owned generating companies in terms of installed capacity.
- Combines over 50 generating enterprises with an aggregate installed capacity of 25.01 GW.
- The volume of electric power produced in 2007 amounted to 82.3 TWh. All the electric power is produced using renewable energy sources (water, wind, tides).
- The revenues of JSC RusHydro in 2007 amounted to $2 billion (consolidated results)
- Shares in RusHydro have been traded on the MICEX and RTS since February 2008. In June 2008, it is intended to launch a GDR programme.
- Capitalisation, according to the RTS, as of 28 May, 2008 amounts to $17.63 billion (data of the FB RTS).
Structure of RusHydro’s equity capital

January 2008 (consolidated results of 20 subsidiaries)

RAO UES ~ 77.9%
RF ~ 1.5%
Minority shareholders ~ 20.6%

July 2008 (Target structure after reorganisation of RAO UES of Russia)

RF ~ 59.9%
Minority shareholders* ~ 40.1%

As of 14 May, 2008, the authorised equity capital of JSC RusHydro amounted to 195 860 496 735 shares

Forecast authorised equity capital of JSC RusHydro after 01 July, 2008 – 250 billion shares
RusHydro on the securities market

Analysts’ opinions:

- Launch of the GDR programme will potentially promote an expansion of the range of investors, which should have a favourable effect on capitalisation of the company. After liquidation of RAO UES of Russia, RusHydro paper has a good chance of becoming a new Blue Chip — the volume of paper in circulation after 1 July will be over $ 6 billion, which is a quite high level for the Russian market.

- RusHydro will become a Blue Chip in the electric power industry segment and, after the reorganisation of RAO UES, the volume of its shares in free circulation will increase from the current 19% to approximately 40%.

- The scale of RusHydro and the liquidity of its shares create all the necessary conditions for the company’s bonds to acquire, in the very near future, a secure Blue Chip image and the basis for them to replace the disappearing RAO UES stock.
Russian “green energy” potential – the sphere of activity of RusHydro

Global economically effective hydro-potential - 8 576 tWh/year

Russian economically effective hydropotential - about 10% of the global potential

Geographical localisation of Russia’s potential:

- **European part** – about 50% developed

- **Siberia** – about 20% developed

- **Far East** – about 3% developed

Hydro-power potential - total 852 tWh/yr

Wind - total 0.5 tWh/yr

Tidal - total 250 tWh/yr

Geothermal - total 1 tWh/yr
The task of hydro-power – supply the state’s key requirements

Dynamics of energy consumption of Russia: facts and forecasts*

Growth dynamics of HPPs*

- Installed capacity (GW)
  - 2006: 45.1
  - 2010: 50.2
  - 2015: 56.6
  - 2020: 67.2 (Basic variant), 72.7 (Maximum variant)

New start-ups programme (GW)*
- Basic variant + 21.6 GW
- Maximum variant + 27.1 GW

- 2006-2010: 0.4
- 2011-2015: 3.3
- 2016-2020: 10.6

* Source: website of RAO UES of Russia» (General location plan of Russian hydro-power facilities up to 2020)
The Investment Programme of JSC RusHydro for 2008-2012 approved by the Management Board of JSC RAO UES of Russia on 17 March, 2008, envisages start-up of 5 GW of generating capacity for a total volume of financing of about $25.5 billion.
Specifics of the hydro-power investment projects

- High dependence on natural conditions
- Non-standard (unique) nature of the engineering part of the projects and, as a consequence, CapEx volatility
- High relative cost of the infrastructure (dam, reservoir and network)
- Undeveloped territories (in the main, absence of consumers) where the hydro-potential is concentrated
- Restrictions imposed by the significant consequences of facility construction for the environment and population of regions
- Price stability in the long term
- Operating life of the facilities
- Restrictions on the possibility of and ineffectiveness of Project Finance

Special schemes must be created for distributing property that would ensure an acceptable yield for the investor and identification of effective project financing schemes
New schemes for implementing investment projects: public-private partnership

One of the state’s key tasks is to form infrastructure conditions allowing business to benefit from developing the economy, ensuring a balance of social, technological and economic development.

Today, the state is an active investor in the power industry, financing the infrastructure part of new projects out of the Investment Fund (for instance, the comprehensive programme for development of Nizhnyeye Prinangarye, the project for development of South Yakutia) and Federal Target Programmes (for example, FTsP Dalniy Vostok and Zabaikalye).

Creation of power industry clusters is an important sphere for implementation of major new hydro-power projects on the territory of Russia and one of the key priorities of the RusHydro Strategy.

Project specifics: on the basis of the principles of public-private partnership, the conditions are being created for forming inter-branch territorial clusters with integral development of production units and the necessary transport, energy and social infrastructure.

Programmes are managed comprehensively, within the scope of specially created bodies – corporations for development of a region, ensuring synchronised creation of the infrastructure and attracting new consumers.
How does it all work?

**PLAN**
- Determination of the territory and dam sites for HPPs, creation of a cluster
- Creation of the transport infrastructure
- Creation of a power infrastructure on the basis of the HPP
- Creation of the social infrastructure
- Inflow of business and appearance of industrial enterprises

**EFFECTS**

**State:**
- Development of territories
- GDP multiplication effects
- Development and retooling of associated industries
- Development of infrastructures
- Provision for sovereign energy security

**Business:**
- Expansion, including on the regional level
- Access to the power and other necessary infrastructures
- Reduction of risks and entry barriers
- Various synthesis effects from hub concentration of industry

**EXAMPLE**
- Programme for comprehensive development of Nizhnyeye Priangarye
- Pilot public-private partnership project on the territory of the RF
- Corporation set up for development of the Krasnoyarsk Territory (jointly by RusHydro, RUSAL and VTB)
- Boguchanskaya HPP – basis for development of the region’s power infrastructure (3000 MW)
- Main consumers: aluminium works and TsBK
- Active participation by the state in creating the infrastructure

**ARGUMENTS IN FAVOUR OF HPPS**
- Independence from energy source price fluctuations
- Long-term stable prices for electric power
- Minimisation of environmental consequences
- System reliability and safety of the power system
- Effective management of the country’s water resources
- Long operating life of hydro-power facilities (100 years of more)
Potential clusters, development on the basis of HPPs (SHPPs, TPPs)
Implementation of the cluster approach
Southern Yakutia hydro-power complex,
Kankunskaya HPP

- The Project “Comprehensive development of South Yakutia”, including construction of the Kankunskaya HPP on the River Timpton, was the winner of a competition to receive funds from the Investment Fund of the Russian Federation.
- The results of the competition were announced at the XI St. Petersburg economic forum
- Preliminary parameters of the HPP:
  - Installed capacity 1600 MW
  - Average annual output 7.5 billion kWh
Biggest future power construction project in Russia

Evenkiiskaya HPP

- Purpose: to provide electric power to the consumers of the Power Grids of the Centre, Siberia and the East; replace natural gas in the energy balance of the RF, partly for export to China
- Design installed capacity up to 8 000 MW
- Average annual output of electric power up to 46 billion kWh
Mechanism for attracting investment into minor hydro-power projects

Creation of an SPV

OWNERSHIP STRUCTURE on when the investor joins the project

Preliminary sale and purchase agreement for the Fund’s share in the authorised equity capital of the SPV

Investor

Not more than 25%

Authorised equity capital of the SPV

At least 75%

TARGET OWNERSHIP STRUCTURE after project completion (start-up of the HPP)

Authorised equity capital of the SPV

Up to 100%
Legislative framework for renewable energy sources in Russia

Federal law No. 35 and relevant amendments

1. The provisions contained in the amendments establish, for the first time, the foundations of the system for supporting development of the power industry on the basis of renewable energy sources.

2. Key measures for supporting renewable energy:
   ✓ subsidising of costs of connection to grids and other costs out of the federal budget
   ✓ requirement on grid organisations purchase power from renewable energy sources at a fixed tariff set by the government
   ✓ subsidising of power from renewable energy sources above the wholesale market price
   ✓ requirement on purchasers on the wholesale market to purchase power from renewable energy sources

3. The government undertakes to develop the main lines of state policy in the sphere of energy efficiency and renewable energy sources, setting the indicators for the share of renewable energy in its production and consumption balances by the year.

4. It is planned to introduce a system of special certificates for renewable ("green") energy, on the basis of which producers are to be supported, production and consumption of power from renewable energy sources is registered and obligation fulfilment monitored.

5. These provisions of the law will come into full effect after the government of the RF passes subjudicial acts and resolutions:
   ✓ payment procedure, level to which power from renewable energy sources is subsidised above the wholesale market price, the tariff for purchase of this power by grid organisations
   ✓ introduction of supplements into the rules governing the electric power markets
   ✓ provision on the National Certification Authority for power from renewable energy sources
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Measurement unit</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
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<tr>
<td>Production of electric power, total</td>
<td>tWh</td>
<td>1 191.1</td>
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<td>1 766.9</td>
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<td>TPP (biomass)</td>
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<td>Tidal</td>
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<td>Share of renewable energy sources (excluding HPP &gt; 25 MW)</td>
<td>%</td>
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<td>Share of renewable energy sources (including HPP &gt; 25 MW)</td>
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<td>Type of renewable energy source</td>
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<td>Solar energy</td>
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<td>Wind energy</td>
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<td>HPP</td>
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<td>&lt; 1 MW</td>
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<td>5 – 25 MW</td>
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<td>Tidal energy</td>
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<td>Medium and high potential geothermal energy</td>
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<td>Biomass (solid, liquid, gaseous)</td>
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<td>Energy of standing water, waves and low potential geothermal energy</td>
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</table>
THANKYOU!

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