REGIONAL APPROACHES: COOPERATION FOR ENERGY SECURITY

Arturas Dainius
Undersecretary of the Ministry of Economy
of the Republic of Lithuania

September 2006
50th IAEA General Conference Special Event
NEW FRAMEWORK FOR THE UTILIZATION OF NUCLEAR ENERGY IN THE 21ST CENTURY:
Assurance of Supply and Non-Proliferation
ENERGY SUPPLY IN THE BALTIC REGION

- Natural gas supply from one source
- Not available supply of low sulphur heavy fuel oil
- Constantly raising prices
- Non-adequate balance of energy resources
- Obligations to close Ignalina NPP by the end of 2009
Lithuania

Population: 3,6 mill.
Area: 65 300 km²
MAJOR GENERATION FACILITIES IN BALTICS

PLANTS | INSTALLED CAPACITY (MW)
--- | ---
ESTONIA |  
NARVA TPP | 1615
BALTIA TPP | 1090
TALLIN CHP | 190
 | 2895
LATVIA |  
RIGA CHP-1 | 142
RIGA CHP-2 | 390
RIGA HPP | 402
KEGUMS HPP | 263
PLAVINAS HPP | 870
 | 2067
LITHUANIA |  
KAUNAS HPP | 100
IGNALINA NPP | 1300
KAUNAS CHP | 178
MAZEIKIAI CHP | 194
LIETUVOS TPP | 1800
VILNIAUS CHP | 384
KRUONIO HPSP | 900
 | 4856

MINISTRY OF ECONOMY
REPUBLIC OF LITHUANIA
Export, installed capacity and consumption in 2004 (two units of Ignalina NPP in operation)

LATVIA
- Installed capacity: 2115 / 1240 MW
- Max. system load: 3.950 / 6.450 TWh
- Total production: 8.440 / 6.940 TWh
- Total consumption: 17.70 / 9.76 TWh

ESTONIA
- Installed capacity: 2530 / 1522 MW
- Max. system load: 8.440 / 6.940 TWh
- Total production: 0.05 TWh
- Total consumption: 0.61 TWh

RUSSIA
- Installed capacity: 220 / 630 MW
- Max. system load: 0.82 / 3.32 TWh
- Total production: 2.73 TWh
- Total consumption: 2.50 TWh

BELARUS
- Installed capacity: 6128.5 / 1950 MW
- Max. system load: 17.70 / 9.76 TWh
- Total production: 17.390 / 9.701 TWh
- Total consumption: 0.05 TWh

KALININGRAD
- Installed capacity: 220 / 630 MW
- Max. system load: 0.82 / 3.32 TWh
- Total production: 1.30 TWh
- Total consumption: 2.73 TWh

MINISTRY OF ECONOMY
REPUBLIC OF LITHUANIA
Export, installed capacity and consumption in 2010 (no Ignalina NPP units in operation)

- **Latvia**: 2669 / 1504 MW, 4.670 / 7.470 TWh
- **Russia**: 1120 / 730 MW, 3.900 / 3.730 TWh
- **Belarus**: Installed capacity / Max. system load
- **Poland**: 3630 / 2450 MW, 10.790 / 12.2 TWh
- **Finland**: 2630 / 1695 MW, 8.480 / 8.030 TWh
- **Sweden**: Installed capacity / Max. system load
- **Kalininingrad**: 1120 / 730 MW, 3.900 / 3.730 TWh

**Legend**
- Red: Installed capacity / Max. system load
- Blue: Total production / Total consumption

**MINISTRY OF ECONOMY
REPUBLIC OF LITHUANIA**
EXPECTED INTERCONNECTIONS OF BALTIC ELECTRICITY TRANSMISSION GRID

Lithuania - Sweden 1000 MW
ESTLINK 350 MW 11.2006
Integrated Baltic and CIS energy system

Lithuania - Poland 1000 MW

NORDEL

MINISTRY OF ECONOMY
REPUBLIC OF LITHUANIA
COMMUNIQUE OF PRIME MINISTERS

The Prime Ministers of Lithuania, Latvia and Estonia signed Communiqué on 27\textsuperscript{th} of February, 2006, where the following energy cooperation objectives were stated:

- To prepare a common energy strategy of the Baltic States by the end of 2006;
- To make common efforts necessary to fully integrate the Baltic electricity market and to harmonize the Baltic market rules with the Nordpool area market rules by 2009;
- To cooperate fully on and support the construction of interconnectors between the Baltic and other EU counties;
- To support the initiative to build a new nuclear power plant in Lithuania;
- To invite the state owned Baltic energy companies Lietuvos Energija, Latvenergo and Eesti Energia as the participating parties, on equal terms among them, to invest in the preparation and construction of the new nuclear power plant in Lithuania.
KEY MEASURES OF THE UPDATED NATIONAL ENERGY STRATEGY

• Together with Latvia and Estonia to prepare a common Energy Strategy and Action Plan, aimed to integrate energy networks to West European and Scandinavian systems, highlighting possibilities of better usage of existing and future generation capacities and measures for increased energy supply security
• By 2012 to built power links with Poland and Sweden and increase the security of electricity supply
• In 2015 to start operation of a new Nuclear Power Plant
• To implement economically justified natural gas interconnection projects to Polish and Finish gas supply systems
• Together with Latvia and Estonia to analyze expedience to construct LNG terminal in one of the Baltic States
• To construct underground gas storages at the integrated natural gas system of the Baltic States, where Lithuania shall have 1 billion m³ capacity
• By 2020 to construct 400 MW additional CHP capacities in Lithuania
## Major Investments in Power and Gas Sectors

<table>
<thead>
<tr>
<th>Project</th>
<th>Capacity</th>
<th>Investment MEUR</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable to Finland</td>
<td>350 MW</td>
<td>110</td>
<td>end 2006</td>
</tr>
<tr>
<td>Power line to Poland</td>
<td>1000 MW</td>
<td>300</td>
<td>2012</td>
</tr>
<tr>
<td>Cable to Sweden</td>
<td>1000 MW</td>
<td>400</td>
<td>2010</td>
</tr>
<tr>
<td>Nuclear unit(s)</td>
<td>1500 MW</td>
<td>3000</td>
<td>2015-2017</td>
</tr>
<tr>
<td>Combined Cycle Gas Turbine</td>
<td>400 MW</td>
<td>200</td>
<td>2010</td>
</tr>
<tr>
<td>Underground gas storage (Lithuania)</td>
<td>500 Mm³</td>
<td>150</td>
<td>2010</td>
</tr>
<tr>
<td>Underground gas storage (Baltic - Latvia)</td>
<td>500 Mm³</td>
<td>150</td>
<td>2009</td>
</tr>
<tr>
<td>LNG terminal (Baltic – Latvia)</td>
<td>3000 Mm³</td>
<td>300</td>
<td>2008-2012</td>
</tr>
</tbody>
</table>
FIRST STEPS TOWARDS NEW NUCLEAR POWER PLANT

• Based on the signed Communiqué, the state owned power companies Lietuvos Energija, Latvenergo and Eesti Energija signed Memorandum of Understanding and started preparation of the Feasibility Study of the new nuclear power plant in the Baltic States
• Lietuvos Energija, Latvenergo and Eesti Energija established 4 working groups for preparation of the Feasibility Study
• The consultants are contracted:
  – Investment bank Dresdner Kleinwort Wasserstein (UK)
  – Colenco Power Engineering (Switzerland)
  – Freshfields Bruckhaus Deringer (UK)
• It is planned to finish the Feasibility Study by the 1st of November, 2006
PRELIMINARY SCHEDULE FOR THE CONSTRUCTION OF NEW NUCLEAR POWER PLANT

TOTAL
Feasibility Study
Decision
Establishment of Company
Tender Documents
Tender
Selection of Winner
Construction
Licensing, Fueling
Ready for Operation
## A European Strategy for Sustainable, Competitive and Secure Energy

<table>
<thead>
<tr>
<th>POLICY OBJECTIVES</th>
<th>MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUSTAINABILITY</strong></td>
<td>Finalize creation of the internal gas and electricity markets</td>
</tr>
<tr>
<td></td>
<td>Ensure that EU internal energy market guarantees security of supply and solidarity between Member States</td>
</tr>
<tr>
<td><strong>COMPETITIVENESS</strong></td>
<td>Community-wide debate on the fuel balance structure</td>
</tr>
<tr>
<td></td>
<td>Impact of climate change</td>
</tr>
<tr>
<td><strong>SECURITY OF SUPPLY</strong></td>
<td>Common strategy on energy technology plan</td>
</tr>
<tr>
<td></td>
<td>A common EU external energy policy</td>
</tr>
</tbody>
</table>
CRITICAL ELEMENTS IN ASSURANCE OF SUPPLY

- Economical
- Physical
- Environmental
- Other (overregulation, political overburdening and interference)
DELIVERY DISTURBANCES

- Temporary suspension of production
- Financial/legal difficulty for producers
- Lack of routes open to nuclear transports – concentration of nuclear transport companies
- Withdrawal from uranium mining towards more profitable activities. Uncertainty on long term prices and costs in mines – currency inflation, regulatory interference.
- Uncertainty in relation to secondary supplies: lack or postponement of investment in new mines, conversion and enrichment facilities.
COMMERCIAL AND TECHNICAL PROBLEMS

- Overdependence on a single source of supply
- Excess restrictions to Russian enrichment services, decrease of competition
- Common centrifuge technology for Urenco & Areva, and its effect on competition
- Uncertainty of US enrichment capacity in future
- Vertical business integration vs. competition and technological development.
- Loss of EU know-how in uranium exploration and mining
POLITICAL / REGULATORY PROBLEMS

• Overregulation, frequent changes and lack of harmonization in transport approvals and/or authorization
• Reduction in number of fuel fabrication plants and complication of related logistics
• Delays and increased uncertainty of new projects due to licensing/ environmental regulations
• Supply disruption from politically unstable regions
STABILITY OF INTERNATIONAL NUCLEAR FUEL SERVICES

- industry supply chain and policies adjustment (purchasing, logistics, inventory etc.);
- utilities enter into long-term business relationships at reasonable price levels with suppliers in order to secure the visibility of their own supplies and make it easier for their suppliers to decide on new investments;
- co-operation between the users of the nuclear fuel (utilities) and the producers is improved;
- a stable regulatory context is promoted to facilitate new investments for the new builds or extensions;
- the close monitoring and analysis of price-insensitive secondary supply is conducted.
FUEL BANK ISSUES - 1

• IDEAL CASE:
  – Fuel assembles ready for shipment

• PRACTICALITIES:
  – The most expensive option
  – Too many types of reactors in operation
  – Different technological levels of countries dealing with nuclear energy generation
FUEL BANK ISSUES - 2

• RECOMMENDATIONS:
  – Assessment of operational fuel stocks at nuclear power plants
  – Analysis of possibilities to make unification of fuel assemblies used at different nuclear power plants
  – Evaluation of technical capabilities to produce required fuel type at major fuel fabrication plants (chains of plants)
  – Nuclear cooperation agreements between interested parties
  – Decision on incentives for fuel fabrication plants
  – OPEC (NUPC) ????.
BACKGROUND

Analysis of the Nuclear Fuel Availability at EU Level from a Security of Supply Perspective
Task Force on Security of Supply
Final Report of the Task Force
February 2005