“Security of supply: Current outlook and future development”

Georgia
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Adviser to the Minister of Energy

INO Gates Regional Seminar on Security of Supply and Interconnectivity
Brussels, Belgium, 10 December 2015
BUILDING PARTNERSHIPS FOR ENERGY SECURITY
www.inogate.org
## Electricity Balance - 2004-2014 years

(Mln.kw/h)

<table>
<thead>
<tr>
<th></th>
<th>generation</th>
<th>consumption</th>
<th>Import</th>
<th>Export</th>
<th>Import share in Total consumption</th>
<th>Export share in total Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>6,902</td>
<td>7,388</td>
<td>1,278</td>
<td>71</td>
<td>17%</td>
<td>1%</td>
</tr>
<tr>
<td>2005</td>
<td>7,061</td>
<td>7,842</td>
<td>1,399</td>
<td>122</td>
<td>18%</td>
<td>2%</td>
</tr>
<tr>
<td>2006</td>
<td>7,622</td>
<td>7,879</td>
<td>777</td>
<td>96</td>
<td>10%</td>
<td>1%</td>
</tr>
<tr>
<td>2007</td>
<td>8,346</td>
<td>7,815</td>
<td>433</td>
<td>626</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>2008</td>
<td>8,451</td>
<td>8,075</td>
<td>649</td>
<td>680</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>2009</td>
<td>8,408</td>
<td>7,642</td>
<td>255</td>
<td>749</td>
<td>3%</td>
<td>9%</td>
</tr>
<tr>
<td>2010</td>
<td>10,058</td>
<td>8,441</td>
<td>222</td>
<td>1,524</td>
<td>3%</td>
<td>15%</td>
</tr>
<tr>
<td>2011</td>
<td>10,105</td>
<td>9,257</td>
<td>471</td>
<td>931</td>
<td>5%</td>
<td>9%</td>
</tr>
<tr>
<td>2012</td>
<td>9,698</td>
<td>9,379</td>
<td>615</td>
<td>528</td>
<td>7%</td>
<td>5%</td>
</tr>
<tr>
<td>2013</td>
<td>10,059</td>
<td>9,690</td>
<td>484</td>
<td>450</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>2014</td>
<td>10,371</td>
<td>10,170</td>
<td>793</td>
<td>545</td>
<td>8%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Natural Gas Balance - 2010-2014 years
(Mln.cub\m)

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azerbaijan (Shah-Deniz)</td>
<td>535</td>
<td>738</td>
<td>717</td>
<td>677</td>
<td>686</td>
</tr>
<tr>
<td>Russia</td>
<td>238</td>
<td>192</td>
<td>204</td>
<td>178</td>
<td>268</td>
</tr>
<tr>
<td>Local</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Socar</td>
<td>349</td>
<td>776</td>
<td>993</td>
<td>1038</td>
<td>1212</td>
</tr>
<tr>
<td><strong>total supply</strong></td>
<td><strong>1131</strong></td>
<td><strong>1711</strong></td>
<td><strong>1920</strong></td>
<td><strong>1898</strong></td>
<td><strong>2170</strong></td>
</tr>
<tr>
<td>Thermal power plants</td>
<td>198</td>
<td>629</td>
<td>702</td>
<td>505</td>
<td>575</td>
</tr>
<tr>
<td>Residential</td>
<td>445</td>
<td>523</td>
<td>529</td>
<td>572</td>
<td>655</td>
</tr>
<tr>
<td>Commercial</td>
<td>478</td>
<td>630</td>
<td>738</td>
<td>824</td>
<td>926</td>
</tr>
<tr>
<td><strong>Total consumption</strong></td>
<td><strong>1122</strong></td>
<td><strong>1782</strong></td>
<td><strong>1969</strong></td>
<td><strong>1901</strong></td>
<td><strong>2157</strong></td>
</tr>
</tbody>
</table>
# Electricity Demand/Supply Scenario of Georgia 2015-2030

## Domestic demand growth by 5%

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Generation</td>
<td>10.96</td>
<td>11.98</td>
<td>12.65</td>
<td>13.10</td>
<td>14.88</td>
<td>17.49</td>
<td>21.50</td>
<td>26.66</td>
<td>29.06</td>
<td>30.27</td>
<td>31.47</td>
<td>32.59</td>
<td>34.05</td>
<td>35.34</td>
<td>36.52</td>
</tr>
<tr>
<td>Other Potentials</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.71</td>
<td>1.42</td>
<td>2.13</td>
<td>2.84</td>
<td>3.79</td>
<td>4.74</td>
<td>5.69</td>
<td>6.64</td>
<td>7.58</td>
<td>8.53</td>
</tr>
<tr>
<td>TPPs</td>
<td>2.15</td>
<td>2.62</td>
<td>2.63</td>
<td>2.13</td>
<td>2.58</td>
<td>3.54</td>
<td>2.32</td>
<td>1.87</td>
<td>1.82</td>
<td>2.08</td>
<td>2.34</td>
<td>2.51</td>
<td>3.02</td>
<td>3.37</td>
<td>3.59</td>
</tr>
<tr>
<td>Import (Deficit)</td>
<td>0.75</td>
<td>0.40</td>
<td>0.66</td>
<td>1.40</td>
<td>0.83</td>
<td>0.01</td>
<td>0.03</td>
<td>0.00</td>
<td>0.00</td>
<td>0.03</td>
<td>0.17</td>
<td>0.00</td>
<td>0.09</td>
<td>0.32</td>
<td>0.61</td>
</tr>
<tr>
<td>Export</td>
<td>0.57</td>
<td>0.93</td>
<td>1.28</td>
<td>1.83</td>
<td>2.40</td>
<td>3.48</td>
<td>6.69</td>
<td>10.91</td>
<td>12.48</td>
<td>12.87</td>
<td>13.25</td>
<td>13.60</td>
<td>13.95</td>
<td>14.34</td>
<td>14.71</td>
</tr>
</tbody>
</table>
Main Priorities Country’s Energy Security Strategy

In order to enhance security of supply, GoG is intend to:

- Decrease existed energy dependence through the maximum utilization own energy resources;
- Diversify energy sources and supply routs;
- Construct new energy infrastructure and rehabilitate existed one;
- Attract foreign direct investment in hydro sector, in order to phase out thermal generation and imports;
- Strengthen regional cooperation, expand electricity exports to neighboring countries and develop new transit routs.

Legal framework for Security of Supply Policy:

- Law on Electricity and Natural Gas (1997);
- New Energy Policy Paper and 10 Year Electricity Grid development plan approved in 2015;
- The Order of Ministry of Energy on “The Electricity (Capacity) Market Rules”(2006);
- “Basic Directions of the State Policy in Energy Sector of Georgia” approved by the Government of Georgia in 2006;
- The State Programme for Renewable Energy 2008;
- Georgian Government Decree on “Determining the Guaranteed Capacity and Guaranteed Capacity Resources at the Electric Energy System of Georgia” (2010, # 193);
- Resolution #214 on “Approval of the rule of Expression of Interest for technical and economic feasibility study, construction, ownership and operation of the power plants in Georgia”(2013);
- The latest amendments to the Law on Electricity and Natural Gas are the market rules for GEMM 2015, providing a legal framework for the electricity sector’s new structure and a new Electricity Trading Mechanism (ETM);
- Socio-Economic Development Strategy to 2020 (June 2014);
Main challenges towards energy security:

- Specific energy strategy paper for Georgia 2016-2025 is still under discussion;
- Due to the expected growth of energy consumption and high prices on import, optimal utilization of local energy resources is on top of the agenda;
- For further increase of energy security level the diversification of supply sources and routes remains as a main challenge;
- In order to ensure uninterrupted supply, improvement of the sustainability and safety of the energy transmission infrastructure is very important;
- For that purpose rehabilitation existed network and construction additional energy infrastructure is still necessary;
- Development of new energy interconnection infrastructure with neighboring countries and increase transit potential is essential for the future development;
- Establishment new competitive energy market and implementation new energy trading mechanism are the first steps towards increasing country’s export capacity;
- Gradual approximation, and later harmonization, of Georgia’s legislative and regulatory framework with the EU’s Energy acquis is one of the main challenges we face today.
From the IV quarter of 2012 year up to II quarter of the 2015 year, in the Energy Sector of Georgia was implemented **500 mln. USD Foreign Direct Investment**, which means that during this period the second largest share (15%) of the Foreign Direct Investments was realized in Energy Sector.
Hydropower Plants commenced during 2013-2015 years

During the three years 10 HPPs were commenced:

<table>
<thead>
<tr>
<th>N</th>
<th>HPP Name</th>
<th>Installed Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bakhvi HPP 3</td>
<td>9.8</td>
</tr>
<tr>
<td>2</td>
<td>Aragvi HPP</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>Shilda HPP</td>
<td>4.8</td>
</tr>
<tr>
<td>4</td>
<td>Khadori HPP 2</td>
<td>5.4</td>
</tr>
<tr>
<td>5</td>
<td>Larsi HPP</td>
<td>19</td>
</tr>
<tr>
<td>6</td>
<td>Akhmeta HPP</td>
<td>9.1</td>
</tr>
<tr>
<td>7</td>
<td>Kazbegi HPP</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>Paravani HPP</td>
<td>87</td>
</tr>
<tr>
<td>9</td>
<td>Alazani HPP 2</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>Pshavela HPP</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Total Installed Capacity – 157 MW
Total Investment Cost – 264.4 mln. USD
Construction works to be finished by 2025

Major energy companies operating in Georgia:
- Anadolu (Turkey)
- Peri (Georgia)
- Ağaoğlu (Turkey)
- Trans Electrica Ltd. (India)
- Clean Energy Group (Norway)
- KGM (Turkey)
- Rusmetal (Georgia)
- Tata Group (India)
Priority Projects and Cooperation with the Investors

- **In August 2015 year,** was signed MOU on implementation of the **280 MW installed capacity** Nenskra HPP project. The electricity generation of the project will be **1.2 TWh.** The total investment of the project is 1 bln. USD.

- In 2015 year significant changes applied to the Khudoni HPP project. The Investor became obliged to leave the total generation of the power plant, which is 1.5 TWh, in Georgia. The investment cost of the project is **1.2 bln. USD.**

- The **rehabilitation works on the Vardnili and Enguri HPPs** are **actively proceeding.**

- **On 21st August 2015 year,** the **Enguri HPP arched dam** was granted Cultural Heritage Status.

- **By the end of the 2015 year,** Debeda HPP and Dariali HPP will be commenced. Sum of the installed capacities is more than **110 MW** and the generation is **543 GWh.** The investment cost for both projects is more than **110 mln. USD.**

- **First Wind Power Plant “Kartli”-** It is planned to implement 20 MW installed capacity Wind Power Plant project, with further perspective of developing it up to 200 MW. In 2016 year, the project is going to be on construction phase.
Regional Power Transmission Enhancement Project

- In 2015 year was approved “Ten year Network Development Plan of Georgia 2015-2025”.
- For the purpose of the regional energy systems technical synchronization facilitation is continued work on the electricity market new model: "Georgian Electricity Market Model and Electricity Trading Mechanisms”.
- The new connecting 400 kV transmission line with Turkey and 500/400/220 kV substation “Akhaltsikhe” construction was completed. The investment cost of the project was 283 mln. Euro.
- New interconnection with Azerbaijan through the commissioning of a new 505 kV interconnection is underway.
- New interconnection with Armenia (planned) will involve a back-to-back DC connection which will terminate at Marneuli Substation (GE).
- The 220 kV transmission line “Senaki 1-2” and corresponding substation rehabilitation-reconstruction was completed, on which was spent 18 mln. USD. Started 220/110 kV “Khorga”, 500/220/110 kV “Ksani”, 220/110 kV “Marneuli” and 220/110 kV “Menji” substations construction-rehabilitation project, the completion of which is planed on 2016 year. The investment is 50 mln. USD.
- Was signed agreement on construction of the 500/220 kV HV substation and 500/220 kV Double Circuit Transmission Line. The project will be finished in 2016 year and the planned investment is 45 mln. Euro. Agreement is in place on construction of the
  220 kV “Akhaltsikhe-Batumi” Double Circuit and
  500 kV “Ksani-Stepantsminda” Transmission Line.

Ongoing and planned projects total investment cost is estimated to be 515 mln. USD.
Completed and Ongoing Thermal Power Plant Projects

- In 2015 year, Partnership Fund and Georgian Oil and Gas Corporation jointly completed 230 MW installed capacity Thermal Power Plant project in Gardabani.
- There is work in progress on the combined cycle 500 MW installed capacity Thermal Power Plant project.
- On 16th June 2014 years, was signed MOU on development of the 100-150 MW installed capacity coal-fired Thermal Power Plant. The construction will start in 2016 and will be completed in the 2019 year.

Construction and Rehabilitation Gas Pipeline Infrastructure

- In spring 2013 was completed „Abasha-Senaki“ 29 km section gas pipeline construction.
- In November 2013 year was completed „Kutaisi-Abasha“ 47 km section gas pipeline construction.
- In summer 2014 year was completed „Kutaisi-Sokhumi“ main gas pipeline passage reconstruction.
- In October 2014 year was completed „Zestaponi-Kutaisi“ section gas pipeline construction.
- In November 2014 year was completed „Rustavi-Sagaredjo“ 25 km section gas pipeline construction.
- In December 2014 year was completed „Gori-Kareli“ 20 km section gas pipeline construction.
- In summer 2015 year was completed „Tsiteli Khidi-Marneuli“ 25 km section gas pipeline construction.
- There is ongoing work on construction of the 200 mln. cubic meter volume underground gas storage for the purpose of storing natural gas. The start of the construction works is scheduled on 2016 year.
Infrastructure Rehabilitation/Development Projects
Southern Gas Corridor

Due to Geopolitical Considerations and Economic attractiveness the EU has been giving Political support to the Southern Gas Corridor Projects

Business supportive environment, liberalized market and moderate tax regime are appealing factors to develop Southern Gas Corridor projects considering Transit of Caspian Gas through GEORGIAN territory
International cooperation

Samples of Donor Activities in Georgian energy sector:

- EBRD financed study about “Electricity Distribution Tariff Reform” in 2013. On behalf of the bank KEMA reviewed the new tariff methodology and performed gap analysis between proposed methodology and international best practice.

- The EU financed Twinning project “Strengthening capacities of the Georgian National Energy and Water Supply Regulatory Commission (GNERC) in updating incentive based electricity tariff methodology” 2012 – 2014 was strengthening the capacities of GNERC and developing the new electricity tariff methodology.

- The EU financed ongoing Twinning project “Strengthening Capacities Of The Georgian National Energy And Water Supply Regulatory Commission (GNERC) In Regulatory Cost Audit And Market Monitoring” 2015 - 2017 aims to strengthen the capabilities of GNERC as the independent national regulatory authority through the development of tools and mechanisms based on best-EU practice regarding regulatory cost audit and market monitoring within the electricity sector.

- The EU funded project under INOGATE ‘Capacity-Building for Energy Regulators in Eastern Europe and central Asia’ January 2009-July 2010 – ext. project supports good and sound energy regulatory practices in the Partner Countries of the INOGATE Programme and promotes harmonisation of energy regulatory practices among them.

- USAID five-year multimillion dollar assistance project G4G (Governing for Growth in Georgia) designed to support the Georgian Government to improve existed business environment in the country. The first conference on “Progression Towards the EU and Electricity Trading Mechanism” within the G4G has already held on November 11, 2015 in Tbilisi;

- Previous USAID projects: EPI (Economic Prosperity Initiative), HIPP (Hydropower Investment Promotion Project) and HPEP (Hydro Power and Energy Planning) made solid gains by increasing market-economy competitiveness. Here should be highlighted their contribution in developing Georgian Electricity Market Model (GEMM 2015) and Electricity Trading Mechanism (ETM).
International cooperation

Samples of Donor Activities in Georgian energy sector:

- Through the support of the European Bank for Rehabilitation and Development (EBRD) and the KfW bank, and within the framework of the Black Sea Transmission Network Project, built the new 400 kv Borchkha- Akhaltsikhe transmission line, supported by the high voltage direct current (HVDC) back-to-back Akhaltsikhe Substation.

- In addition, KfW, the Asian Development Bank (ADB) and EBRD are also supporting the rehabilitation of the Jvari-Khorga transmission line and relevant key substations.

- USAID supported the GoG to replace or refurbish 147 kilometers of critical natural gas pipeline segments between Poti and Gori, which will enable local consumers to receive regular access to natural gas.

- Recently, the International Finance Corporation (IFC) announced its involvement in a US$ 250 million project to rehabilitate the Shuakhevi hydropower plant (HPP), located in the Adjara Region. The IFC debt arranged financing consists of two US$ 90 million long term senior loans, one each from ADB and EBRD, with US$ 70 million committed from IFC.

- To support The Paravani HPP construction costs, the EBRD invested US$ 52 million, while an additional US$ 40.5 million came from the IFC and a further US$ 23 million was raised from commercial banks.

- The overall Enguri and Vardnili HPP Rehabilitation Project is financed by EBRD, EIB and EU NIF.
cooperates with the EU under the different instruments

Considering the fact that, the main target of the country’s energy policy is the approximation of Georgia’s energy sector parameters with the best practices of the energy market in the European Union, the assistance provided by the EU via the different cooperation instruments is very valuable for Georgia

• By signing the Association Agreement with the EU, Georgia has committed to reform its energy sector and implement the EU Energy Acquis.

• Active negotiations are underway for membership of Georgia in the European Energy Community as the pathway of implementing the commitments under Association Agreement.

• The Energy Community establishing treaty and effective energy Acquis contain significant safeguard measures to be taken by contracting parties to respond energy crises and be prepared for emergency situations. The third round of negotiations have already been conducted and the fourth one is expected in the beginning of 2016.

• The EU assistance through the INOGATE programe, which is providing technical assistance to Georgia’s key energy stakeholders and support the progress of country in achieving energy reforms.

• The INOGATE Programme was one of the main development and co-operation instruments used to deliver the goals set under the Baku Initiative (2004) and the Astana Energy Roadmap (2006), which focused on security of supply, energy market convergence, sustainable energy, and investment attraction.

• In 2015 year, Georgia became Energy Charter Chairman country and recently host the 26th Meeting of the Energy Charter Conference in Tbilisi.
Thank you!

Nana Pirtskhelani
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INOGATE Technical Secretariat and Integrated Programme in support of the Baku Initiative and the Eastern Partnership energy objectives