Renewable Energy: Advantages and Challenges

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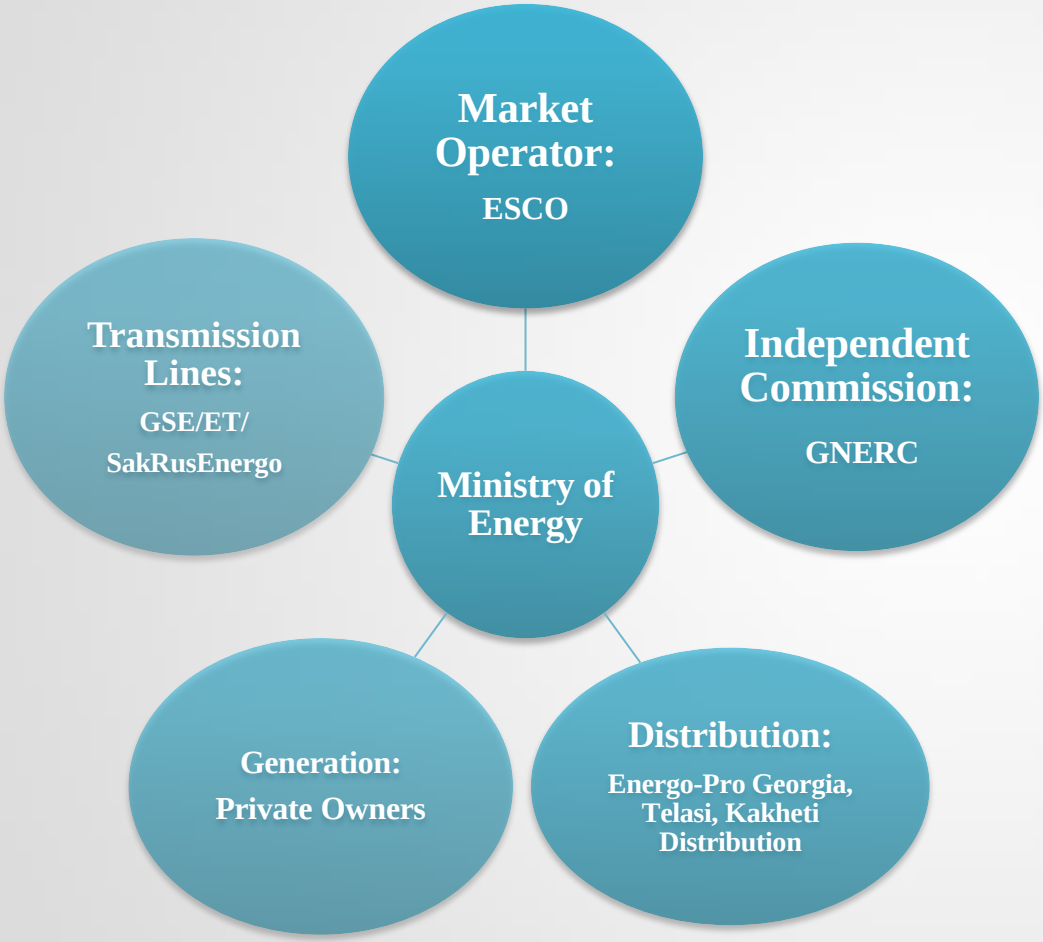
Energy Sector of Georgia



Ministry of Energy
- Sets policies and is responsible for facilitating investment projects

Independent regulator – GNERC
- Establishes tariffs, licensing rules and standards
- Resolves relations between customers and companies

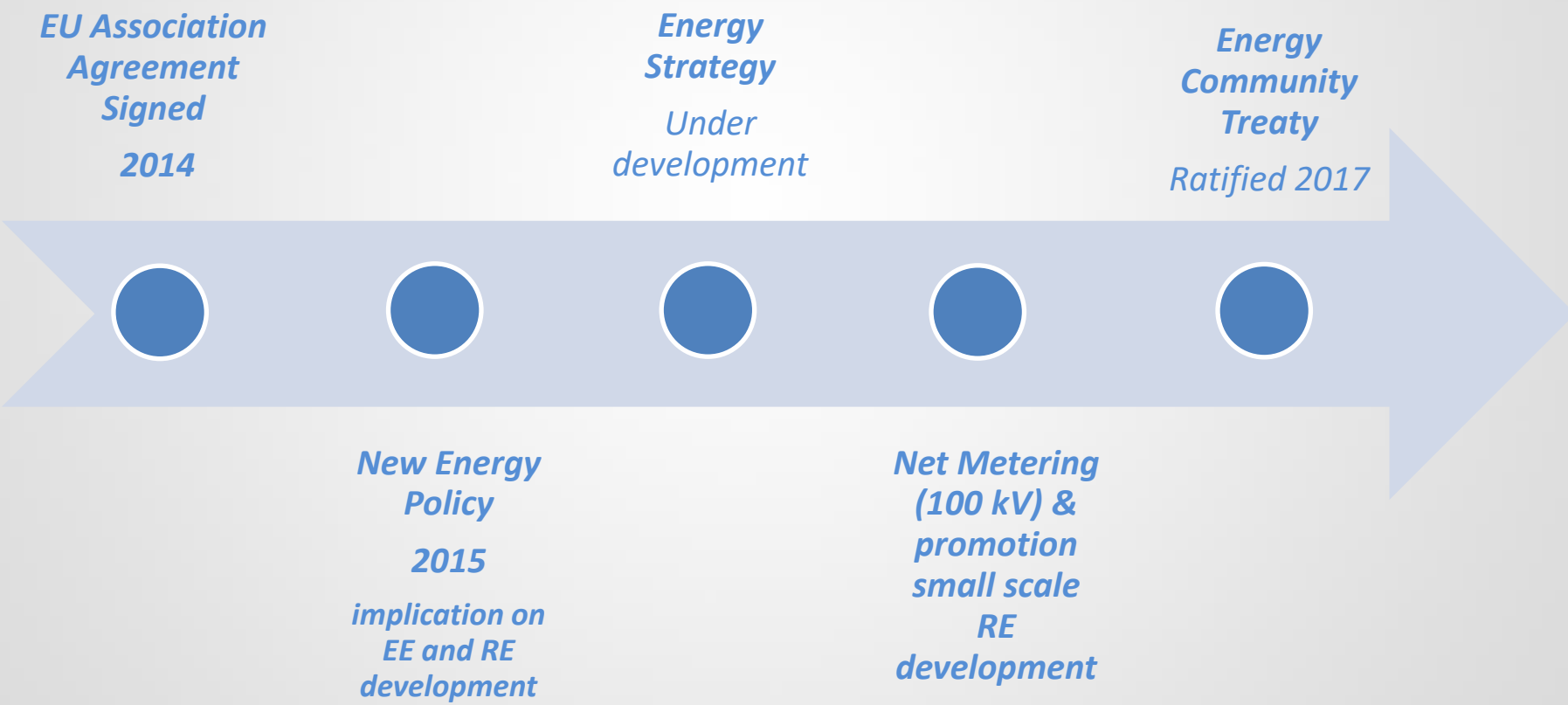
Technical operator/Transmission Services - HV lines, HV substations and dispatching
- **GSE** and **ET** (100% state owned)
- **SakRusEnergo** (50% state owned and 50% owned by Inter RAO)

Electricity System Commercial operator – ESCO
- Balances market, emergency import/export
- Reserves capacity trader

Generation
- 71 Hydro Power plants & 1 Wind power plant
- 5 Thermal Power plants

Distribution Companies
- All 3 Distribution Co.s under the private ownership: Telasi, Energo-pro Georgia, Kakheti Distribution

Strategic Directions of Energy Policy



Ensuring security of energy supply and improving Georgia's overall Energy security by:

- *Diversification of the energy supply resources, optimal utilization and reserve creation of the Georgian energy resources;*
- *Efficient exploitation of renewable energy resources;*
- *Gradual approach of Georgian legislation to EU legislation;*
- *Georgian energy market development and improvement of the energy trade mechanisms;*
- *Increasing the role of Georgia as a regional transit country;*
- *Georgia – clean energy production and regional center for the energy trade;*
- *Creation of unified approach on Energy Efficiency and its execution;*
- *Consideration of the environmental issues while implementing energy projects;*
- *Improvement of the service level and consumers rights protection.*

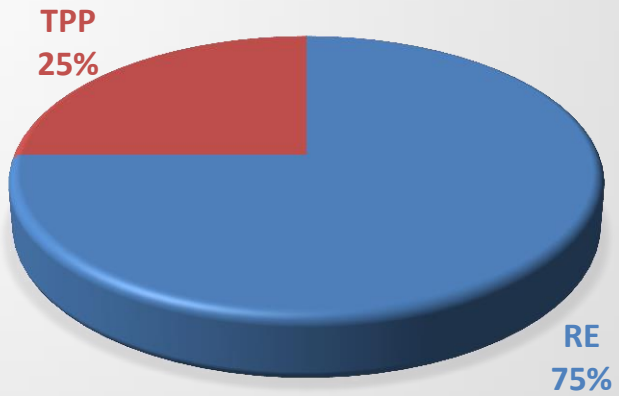
Installed Capacity of the System
3836.15 MW

Hydro Power:
Operating HPPs
Installed Capacity – 2911.75 MW

Wind Power:
1 Operating WPPs
Installed Capacity – 20.7 MW

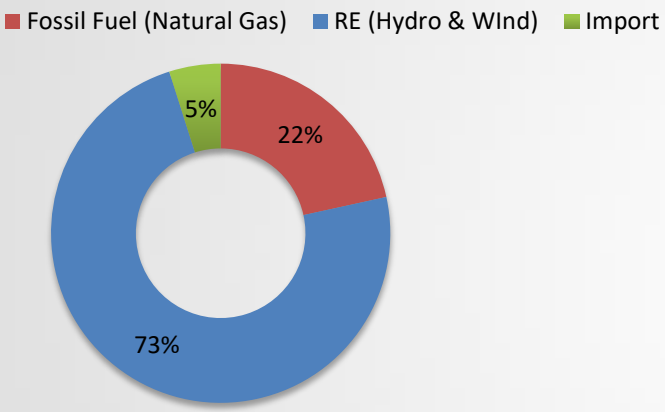
Thermal Power:
5 Operating TPPs
Installed Capacity – 924.4 MW

INSTALLED CAPACITY OF POWER PLANTS IN GEORGIA

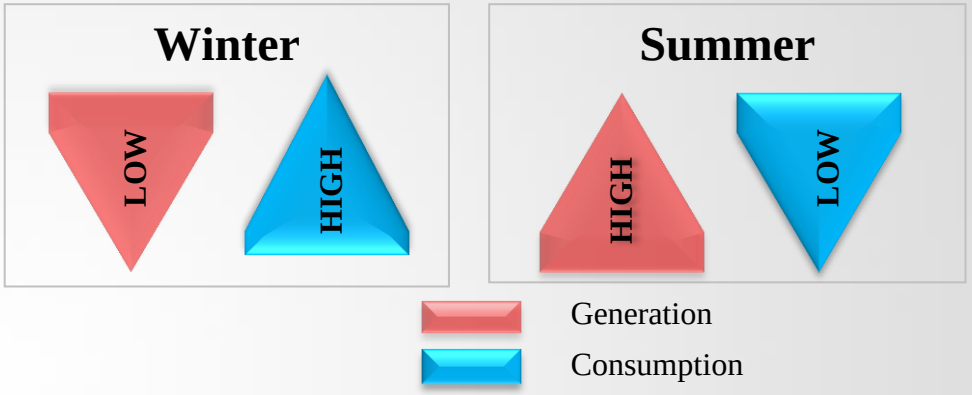


Electricity Resources

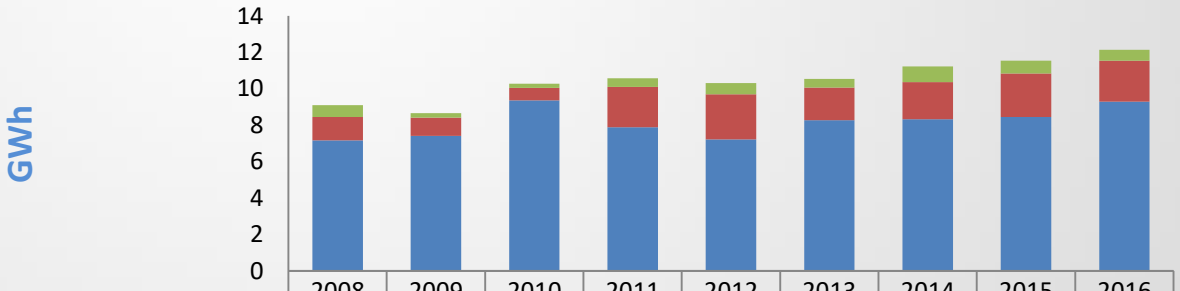
Electricity Supply by Sources 2016



Seasonal Asymmetry of Generation and Consumption



Electricity Supply by Sources 2008-2016



	2008	2009	2010	2011	2012	2013	2014	2015	2016
Import	0,65	0,25	0,22	0,47	0,61	0,48	0,85	0,7	0,6
Fossil Fuel natural gas	1,28	0,99	0,68	2,21	2,48	1,79	2,04	2,38	2,23
RE hydro	7,17	7,42	9,37	7,89	7,22	8,27	8,33	8,45	9,3

Wind and Solar Energy Utilization

Wind Power Plant KARTLI – Pilot Project

Location: Shida Kartli, Gori

Installed Capacity: 20.7 MW

Annual Generation: 88 GWh

Exploitation: October, 2016

Company: JSC GEDF

Operating Solar Pvs: 400 kV in remote areas for households

Grant from the Japanese government for:

- 316 KW Solar PV installations at Tbilisi International Airport
  337,000 kWh annual generation, covers 40 % of Terminal total consumption
- 35 KW Solar PV installations at Ilia State University
  30,000 kWh annual generation, covers 15% of building's total consumption

Renewable Energy Potential

Hydro Potential	Theoretical 137 billion KWh
	Technically feasible 90 billion KWh
	Economically feasible 50 billion KWh
WIND Potential Theoretical	Generation - 4 billion KWh
	Installed capacity -1500 MW
SOAL Theoretical	250-280 sunny days
	average radiation 4.2 kwh/m^2
	2000-2500 MW
Geothermal water reserves	250 mln m^3 per year
	30-100 ^{0} C

Further Developments

- 8 HPP expected to be commissioning in 2017;

- Construction and licensing Stage:

  35 HPP projects - total installed capacity 1.642 MW; Generation 5371 GWh; Estimated total investment - 3 billion US Dollars;

- Feasibility stage with construction liabilities:

  23 HPP Projects - total installed capacity 1,173 Mg. 5,189 GWh. Estimated total investment - 2 billion US Dollars;

- Feasibility Study Stage - 60 RE Projects - estimated total investment 3 billion US Dollars

  10 Wind Project total installed capacity 822 MW;

  3 Solar Project total installed capacity 555 MW.

RE Supporting Policy Development

- ✓ NET Metering for small scale RE technologies – Implemented;
- ✓ Drafting the regulation for RE integration in to the electricity grid - initial stage under the DANIDA Project
- ✓ Improvement of existing legislative framework in compliance with EU Directives -2017-2018:
  - Emending Law on Electricity and Natural Gas ;
  - Finalization of first National Energy Efficiency Action Plan;
  - Elaboration of National Renewable Energy Action Plan

Advantages

- Diversification of energy supply sources and increase of energy security;
- Boost of Economic development – Job creation;
- Reduction of GHGs.

Challenges

- Difficulties of curtain technologies cussing unreliability of the energy system;
- Technology price;
- Environmental aspects;
- Regional characteristics.

Thank you for attention!

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