Hydropower: from the identification of the potential to the development of regional projects

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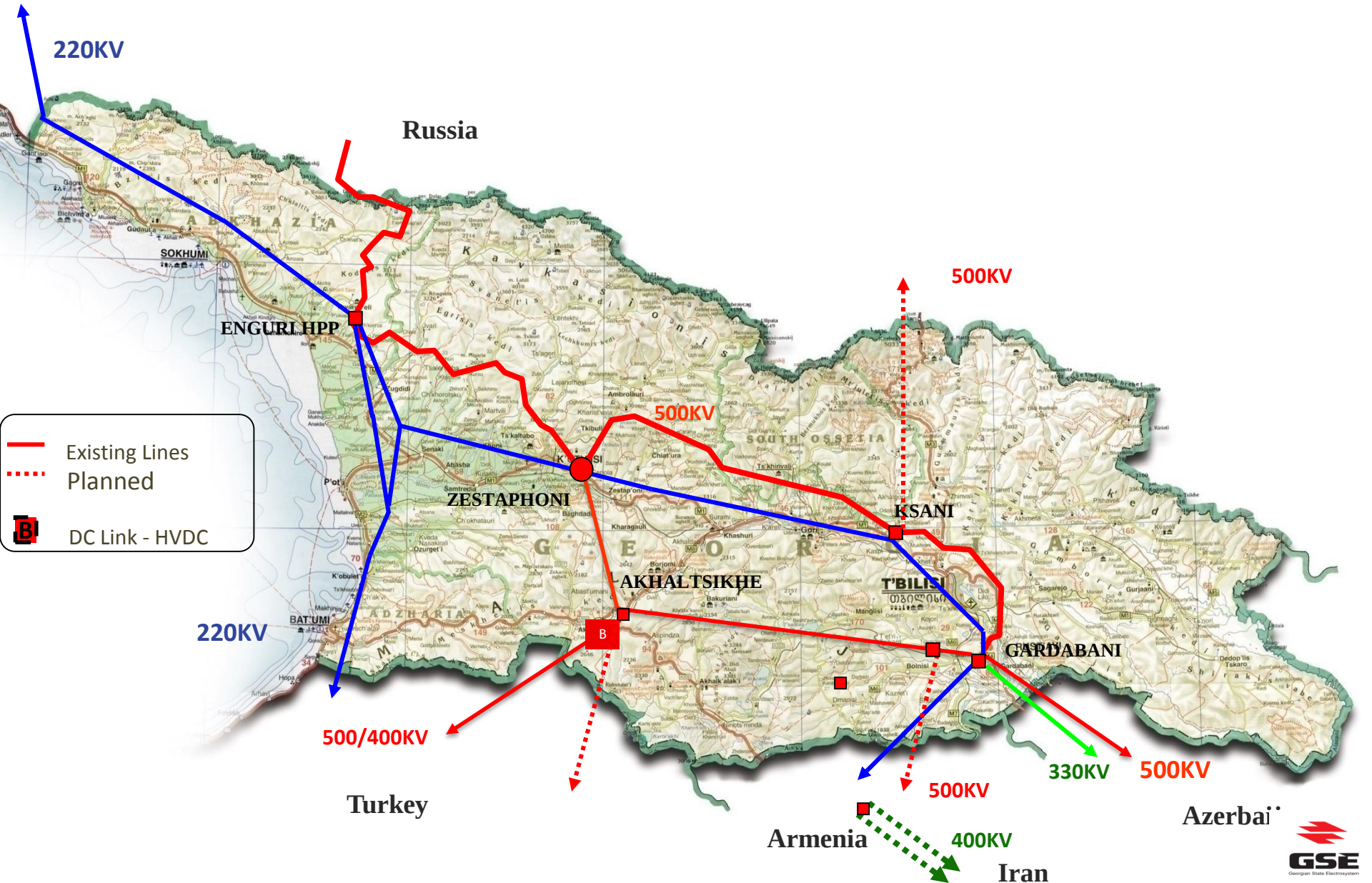
Interconnection and HV internal lines



Current Structure of Power System

Georgian State Electrosystem (TSO)

- System Control (Dispatching)
- 500/220/110 kV Substation
- 220/110 kV lines

Sakrusenergo

- 500/330/220 kV lines

Energotrans

- 500 kV Substation
- 500/400 kV lines
- 700 MW HVDC

Under Operation Agreement all HV equipment is transferred to GSE operational Control which makes GSE only TSO in Georgia

Electricity System Commercial Operator (ESCO)

- Role of Market Operator
- State owned Trader (import/Export, PPA)
- Settlement

Generation

- Thermal PP (695 MW)
- Hydro Power Plants (2795 MW)

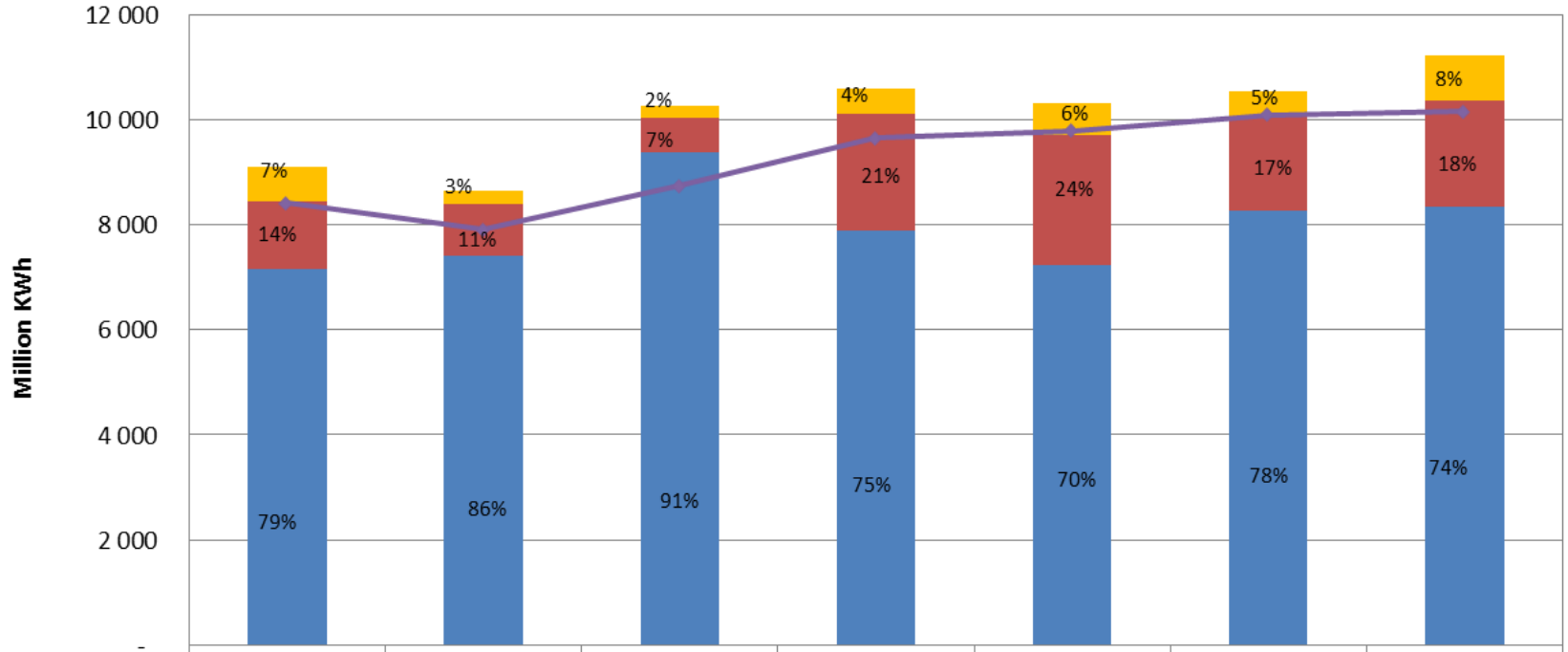
Consumption

- Distribution (4)
- Direct Customers (5)

Import/Export

- ESCO
- Private Companies (2/19)

Electricity Supply-Demand
2008-2014



	2008	2009	2010	2011	2012	2013	2014
Import	649	255	222	471	615	484	852
Thermal Power Plants	1 279	991	679	2 216	2 477	1 788	2 036
Hydro Power Plants	7 162	7 412	9 368	7 890	7 221	8 271	8 335
Consumption	8 411	7 908	8 744	9 647	9 784	10 093	10 155
Consumption Growth Rate	12%	-5%	19%	3%	-3%	2%	6%

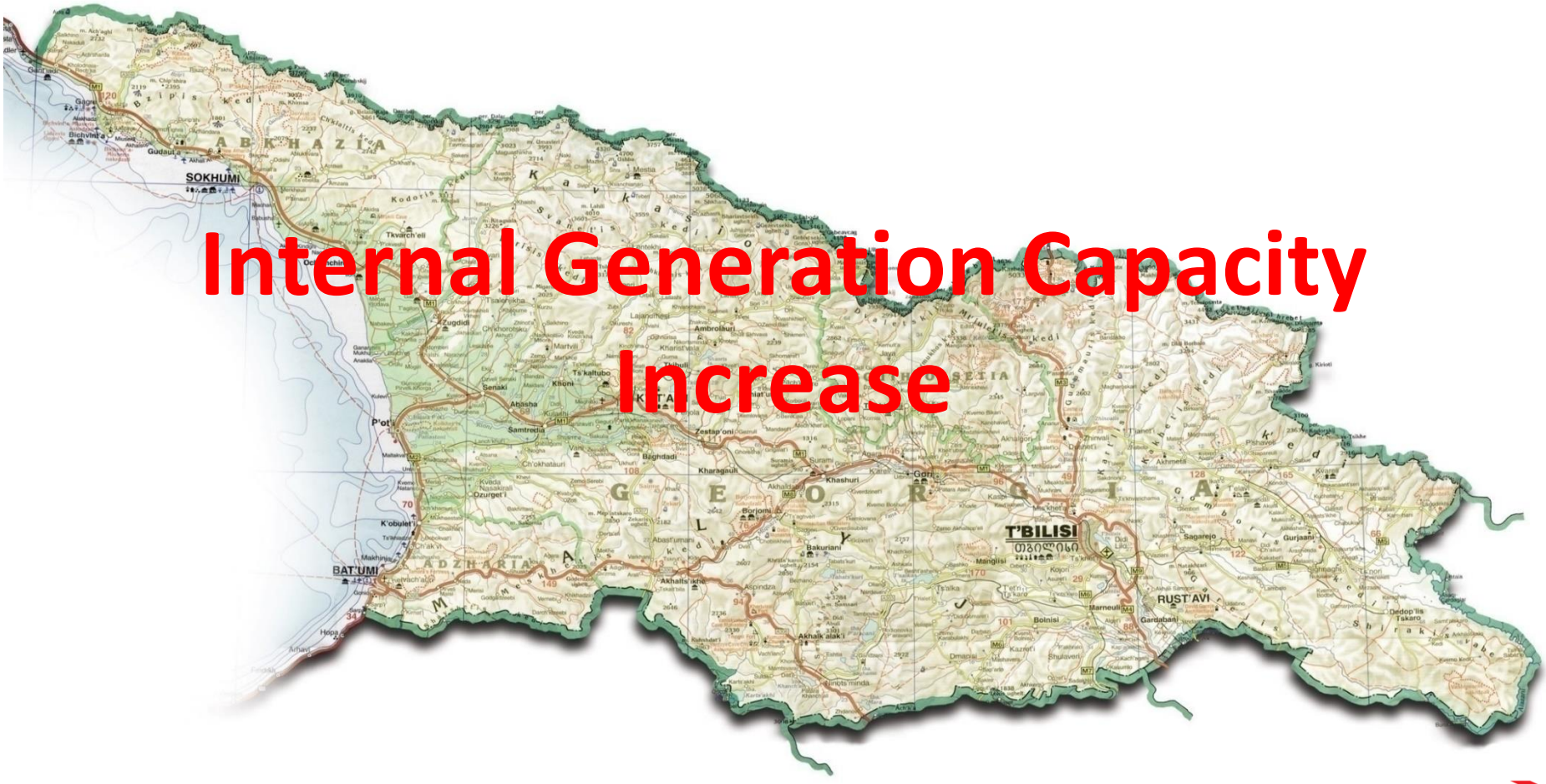
HYDRO POWER Resources

- Hydro power sources in Georgia has most potential and priority.
- There are more than 27000 rivers In Georgia.
- Economically effective technical potential of hydro resources of the country is 45-50 billion KWh from total up to 80-85 billion KWh
- At present from the existing resources only 10-15 % is used.
- Significant amount of hydro potential realization is anticipated, by building of HPPs, with various types, capacities and reservoirs in the next years.

Main steps to success

- **Internal Generation Capacity Increase – Increase power exchange potential**
- **Network Transfer capacity Increase – maximizing power flow and its reliability**
- **Implement Modern Power Trade Structure - gradually setting Hourly Markets**

Step 1



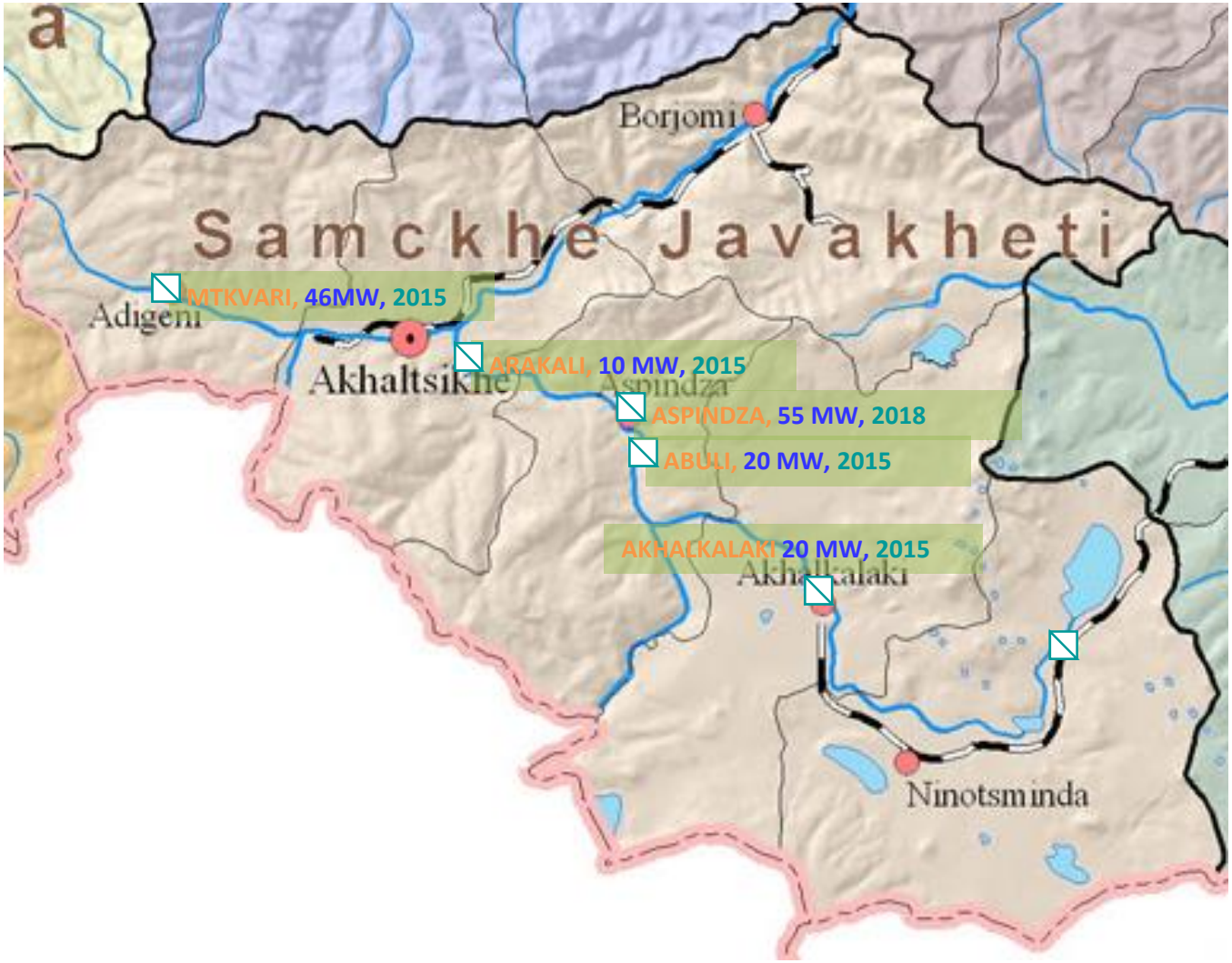
Internal Generation Capacity Increase

SAMEGRELO – ZEMO SVANETI REGION PROJECTED HPPs

RACHA-LECKHUMI-KVEMO SVANETI REGION PROJECTED HPPs

GURIA REGION PROJECTED HPPs

SAMTCKHE JAVAKHETI REGION PROJECTED HPPs

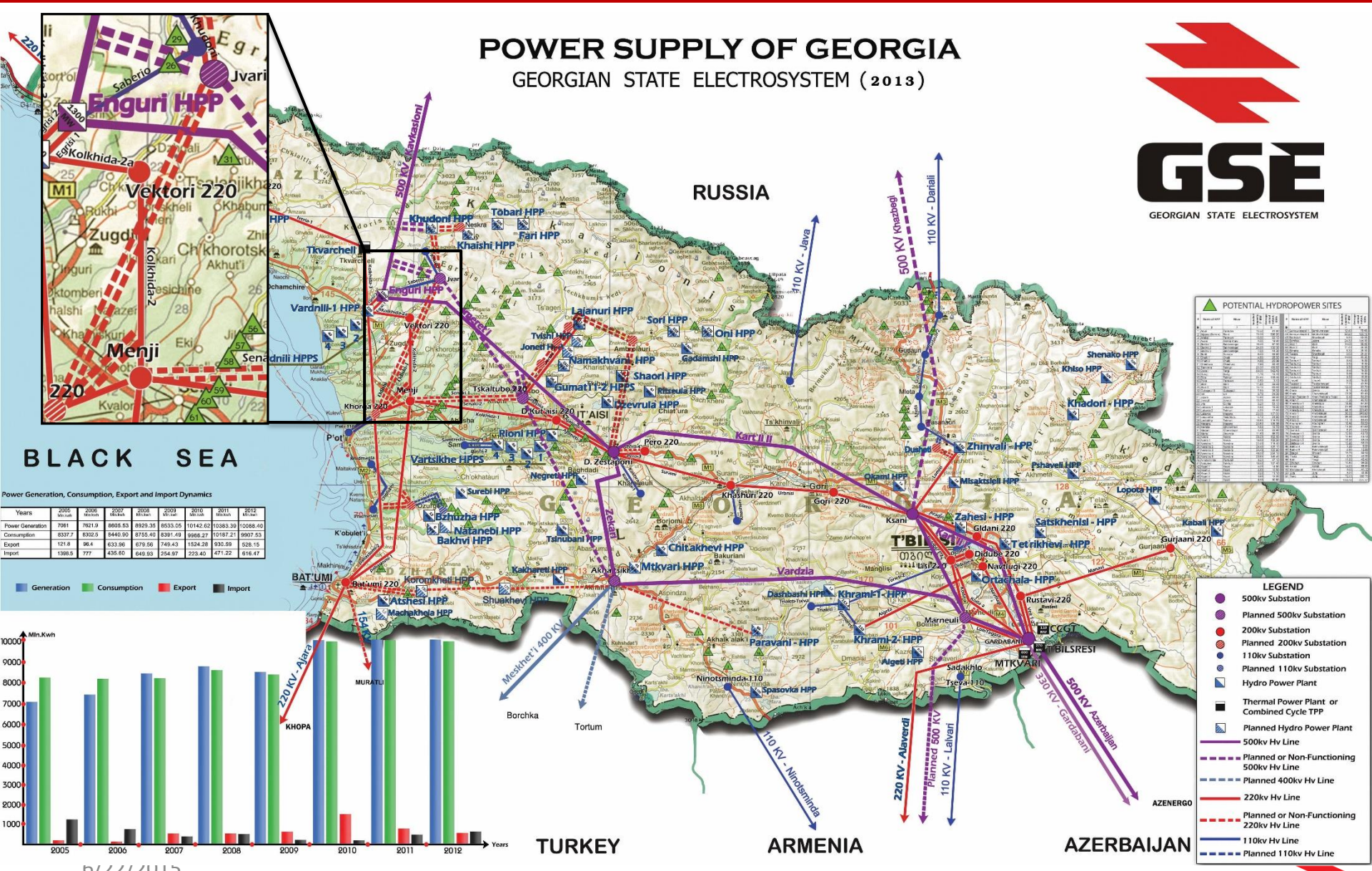


Ongoing Investment Projects 2015-2025

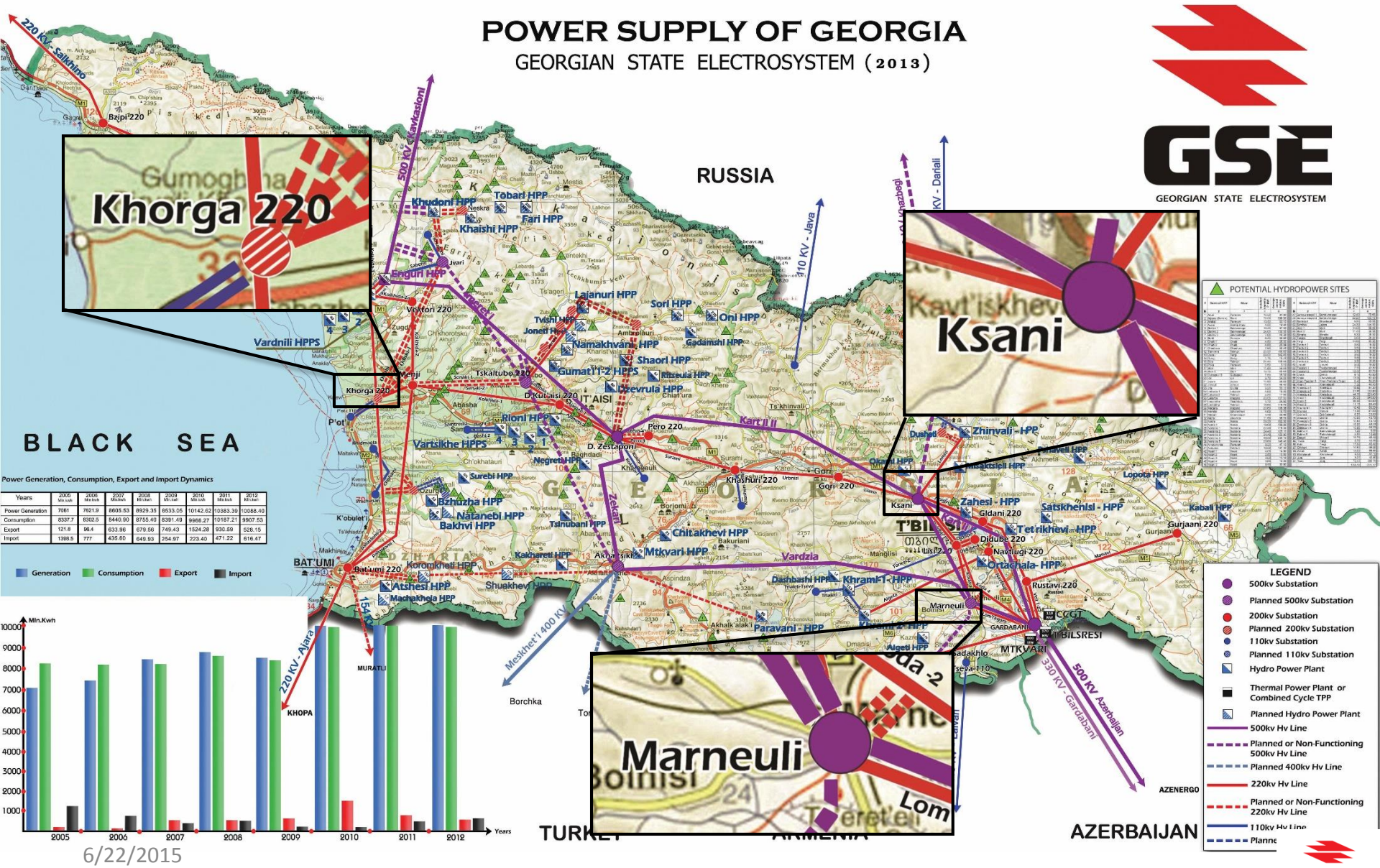
Categories		CAPACITY	POWER
		MW	GWh
K1	Power Plants on which MoU are sigend and construcion works started	*873*	*3387*
K2	Power plants on which interest is expressed and feasibility studies are started	*1515*	*6497*
K3	High state importance power plants and power plants which feasibility studies will start soon	*1567*	*5466*
	Total	**3955**	**15350**

Step 2

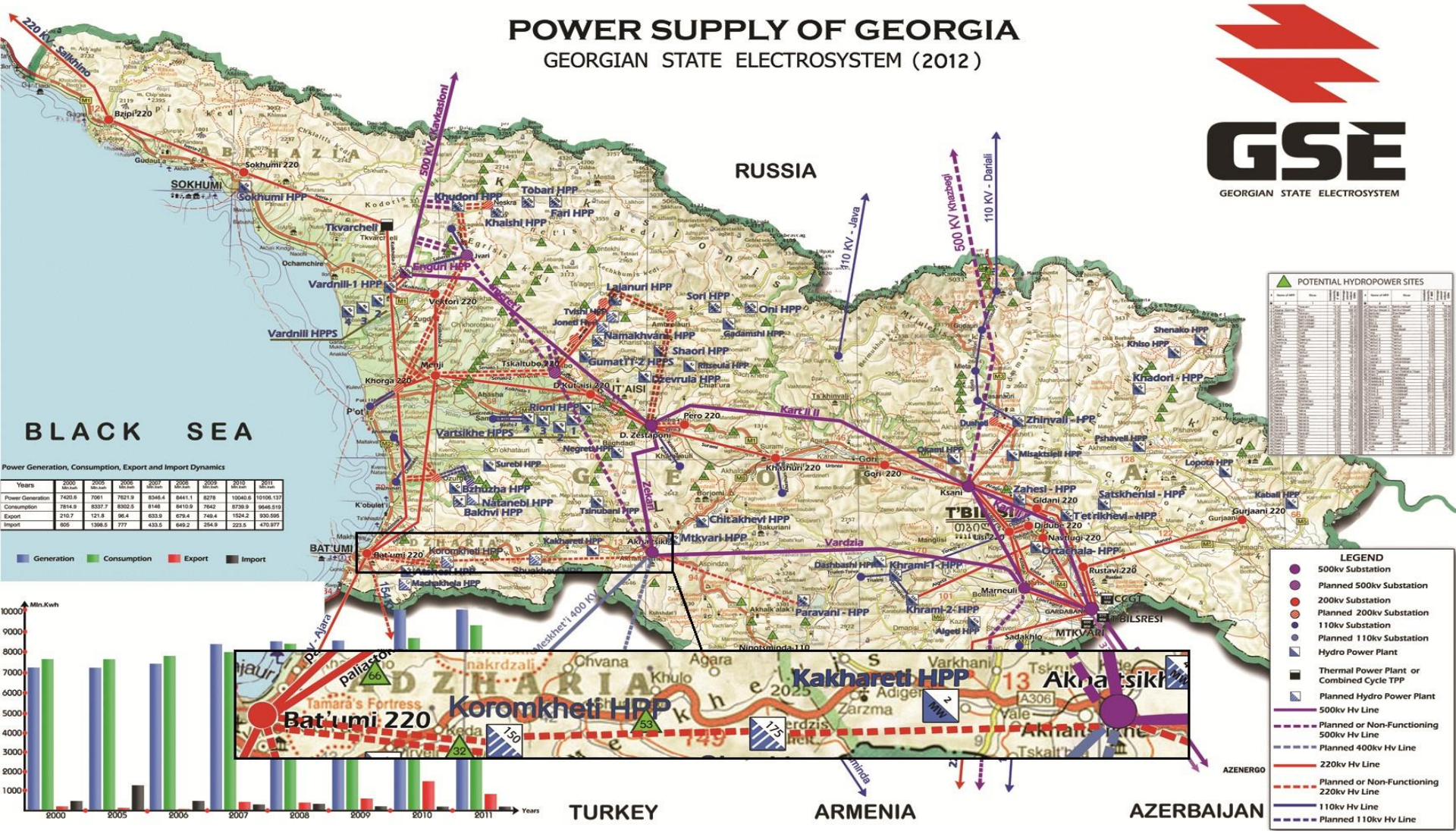
Project: SS “Jvari-500”, OHL “Odishi 1,2”



ADB – Regional Power Transmission Enhancement Project

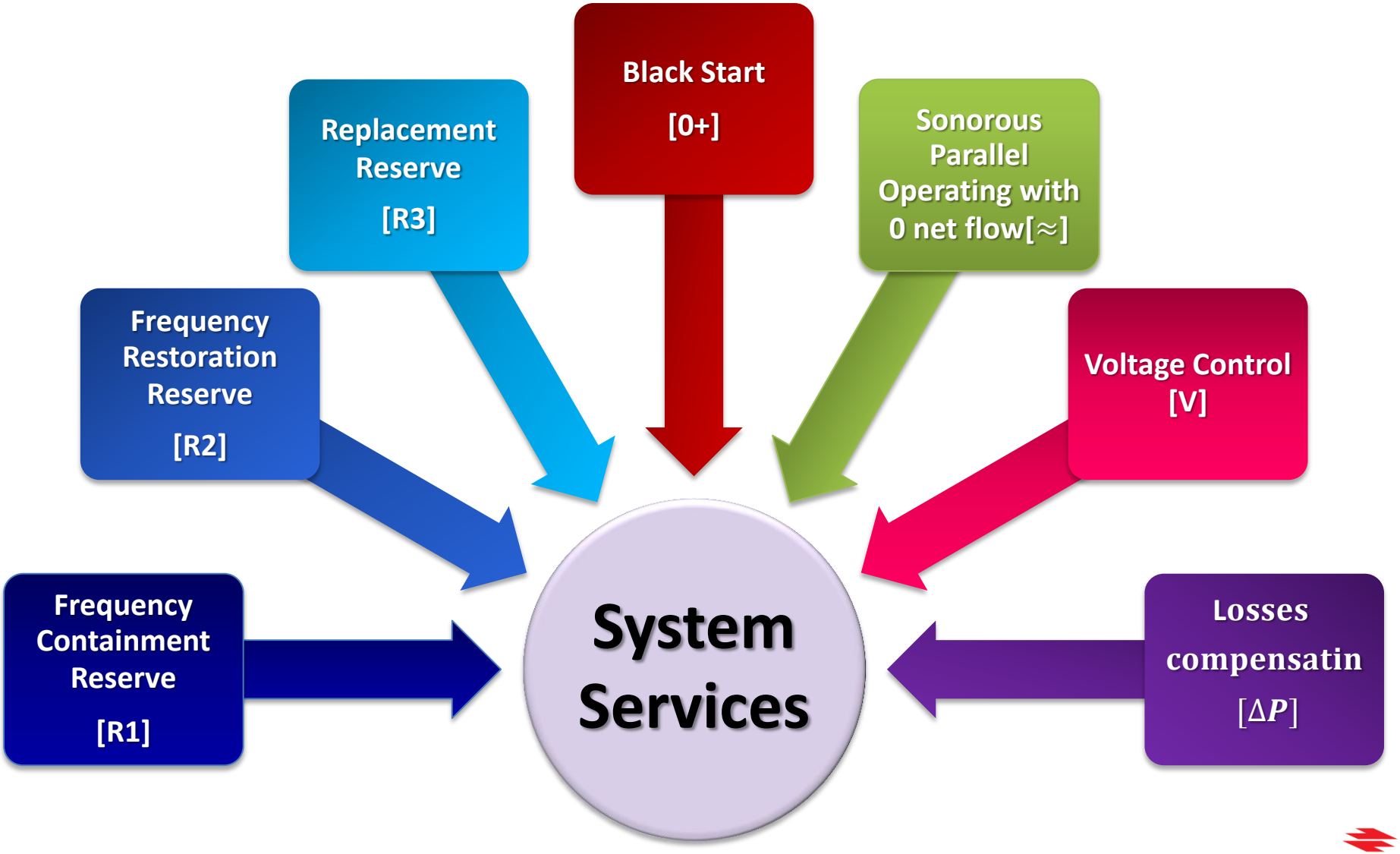


OHL “Akhaltsikhe-Batumi”



HV Transmission Network and Interconnections after implementation 2015-2025 TYNDP

System services



Step 3

Implement Modern Power Trade Structure

Action to be taken for regional trade

- **Power Trade**
  - Set compatible Power trade mechanisms
  - Bringing together power markets as much as it possible
  - Market Coupling or power trade HUBB
- **Cross border Power trade**
  - Agree NTC for all cross border lines
  - Auctions for NTC
  - Implement NTC auctioning common tool for regional trade
- **Deepening of Inter-TSO cooperation**
  - Implement compensation mechanisms for deviation from schedules
  - Contracted flows' netting
- **Legal issues**
  - Improve and Harmonization taxation and custom legislation for Power cross-border flow
  - Harmonization of regulatory framework

GSE
Georgian State Electrosystem

Possibilities, Opportunities and Benefits

- Use Hydro Power Generation Capacities during Spring and Summer floods
- Use Reservoir Power plants flexibility to cover pick demand
- Increase share of renewable Hydro power plants in the region
- Increase level of reliability
- Decrease necessary reserve capacity for a single system
- Access to European power Markets
- Become ENTSO-e Members
- Increase investments in power and other industries

GSE
Georgian State Electrosystem

Thanks you for your Attention!

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