Implementation of projects to increase energy efficiency in high-voltage power transmission systems

Sergey Katyshev
JSC “KEGOC”
28 30 September, 2010 Astana
International Energy Efficiency Forum
Agenda

1. JSC “KEGOC”

2. Investment Projects

3. Consulting Assistance
1. JSC “KEGOC”
General information on the Company

- KEGOC JSC includes: National Dispatch Center of System Operator, 9 Branches of Intersystem Electric Networks, “Energoinform” Agency and “KEGOC-Service” Agency
- Natural monopoly
- System Operator of the Unified Power System of Kazakhstan;
- Member of Electric Energy Council of CIS countries and Council of Integrated Power Systems of Central Asian Countries
- Owns grid facilities including:
  - 24.5 ths km of transmission lines
  - 74 transformer substations with total capacity of 33.7 ths MVA
Functions of System Operator

1. Provision of system services for:
   - electricity transmission via the National Power Grid;
   - technical dispatching;
   - frequency and capacity control.

2. Arrangement of operation in parallel with CIS power systems;

3. Coordination with System Operators of neighboring countries power systems of the values of energy flows via interstate transmission lines;

4. Management of real-time balancing electricity market
2. Investment Projects
Projects for the High-Voltage Power Transmission Systems Modernization and Development

- Kazakhstan Electricity Transmission Rehabilitation Project. Phases I. II
- Construction of 500 kV Second Transmission Line of Kazakhstan North-South Transit
- Construction of 500 kV Alma SS Connected to Kazakhstan Power Grid via 500. 220 kV Lines
- Moinak Electricity Transmission Project
“Kazakhstan Electricity Transmission Rehabilitation Project”

Project value – KZT 43.77 bln., including:
- Loan proceeds of IBRD and EBRD - USD 185 mln., own funds of KEGOC JSC

Project components
- Modernization of high-voltage equipment
- Substations automation and relay protection replacement
- Installation of Supervisory Control and Data Acquisition and Energy Management System SCADA/EMS
- Implementation of digital Corporate Telecommunication Network
- Integration of Commercial Metering System (CMS)
- Implementation of Electricity Trading System
Project “Construction of 500 kV Second Transmission Line of Kazakhstan North-South Transit”

Project value – KZT 41.4 bln.
Route: Ekibastuz – Agadyr – YuKGRES – Shu
Line length: 1 115 km
Implementation period: 2004 - 2009
Financing sources: IBRD and EBRD, DBK and own funds
Loan of IBRD – USD 100 mln.
Syndicated loan of EBRD – USD 147.8 mln.
“Kazakhstan Electricity Transmission Rehabilitation Project - II”

Project goals:

Improvement of technical level, energy efficiency, reliability and stability of UPS Kazakhstan operation

The Project envisages as follows:

- Modernization of equipment at National Power Grid substations not covered by the scope of works provided under Modernization of National Power Grid, Phase I
- Construction of 220 kV lines, total length – 316 km.

Value – KZT 52, 0 bln., EBRD (255 € mln.), own proceeds of KEGOC JSC

Implementation period: 2009-2016
“Moinak Electricity Transmission Project”

Project goal:
Ensuring power delivery from Moinak HPP

The Project envisages:
- Construction of 220 kV OHTL MHPP – Shelek SS
- Construction of 220 kV OHTL MHPP – Robot SS
- Construction of 220 kV OSG at Moinak HPP
- Extension of 220 kV OSG at 220 kV Robot SS
- Extension of 220 kV OSG at 220 kV Shelek SS

Value – KZT 10.4 bln.
IBRD, Republican Budget, own proceeds of KEGOC JSC

Implementation period: 2009-2012
“Construction of 500 kV Alma SS connected to Kazakhstan National Grid via 500 kV, 220 kV lines”

Project goals:

- improvement of power supply reliability and coverage of power needs of consumers in Almaty and Almaty region
- ensuring of power delivery of the first stage of Balkhash TPP (1320 MW)

Value – KZT 30.0 bln.

Republican Budget, IBRD, own proceeds of KEGOC JSC

Implementation period: 2009-2014
3. Consulting Assistance
Consulting Assistance

- SwedPower/MVV (Sweden/Germany) – Project Management and Procurement Consultancy Contract
- KEMA Consulting (USA) – Contract for Development of Tender Documents for SCADA/EMS
- KEMA Consulting – Contract for Development of Grid Code
- ESBI (Ireland) – Contract for Design & Procurement of MIS
- SASK Power (Canada) – Technical consulting on Circuit Breakers, Disconnect Switches & Insulators, Current & Voltage Transformers, Automation & Protective Relays
- Nord Pool Consulting - Spot Market Rules
- MVV Consulting (Germany) - Project Management and Procurement Consultancy Contract
- RSW International/Khatib&Alami (Canada/Lebanon) - Technical consulting