



**Workshop on
Regional Electricity Cooperation within Central and South Asia**

**Current Situation and Development of Electricity
Sector of the Republic of Kazakhstan**

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**Bishkek, Kyrgyzstan
26 April 2007 г.**

Schematic Map of Electric Networks of UPS of Kazakhstan and Connections with Neighboring CIS Countries



General Indicators of Electric Power Sector in 2006

Installed capacity (as of 1 January 2007)	18 773 MW
Available capacity	14 617 MW
Maximum electric load	11 225 MW
Electric power consumption	71.77 billion kWh
Electric power generation	71.55 billion kWh
Export to Russia	3.73 billion kWh
Import from Russia to West Kazakhstan	1.87 billion kWh
Import from Central Asia to South Kazakhstan	2.08 billion kWh

Market Relationship in Kazakhstan Electric Power Sector

Types of activities are divided into competitive and monopoly:

competitive – electric energy production and trade

- Electric energy production;
- Electric energy trade;

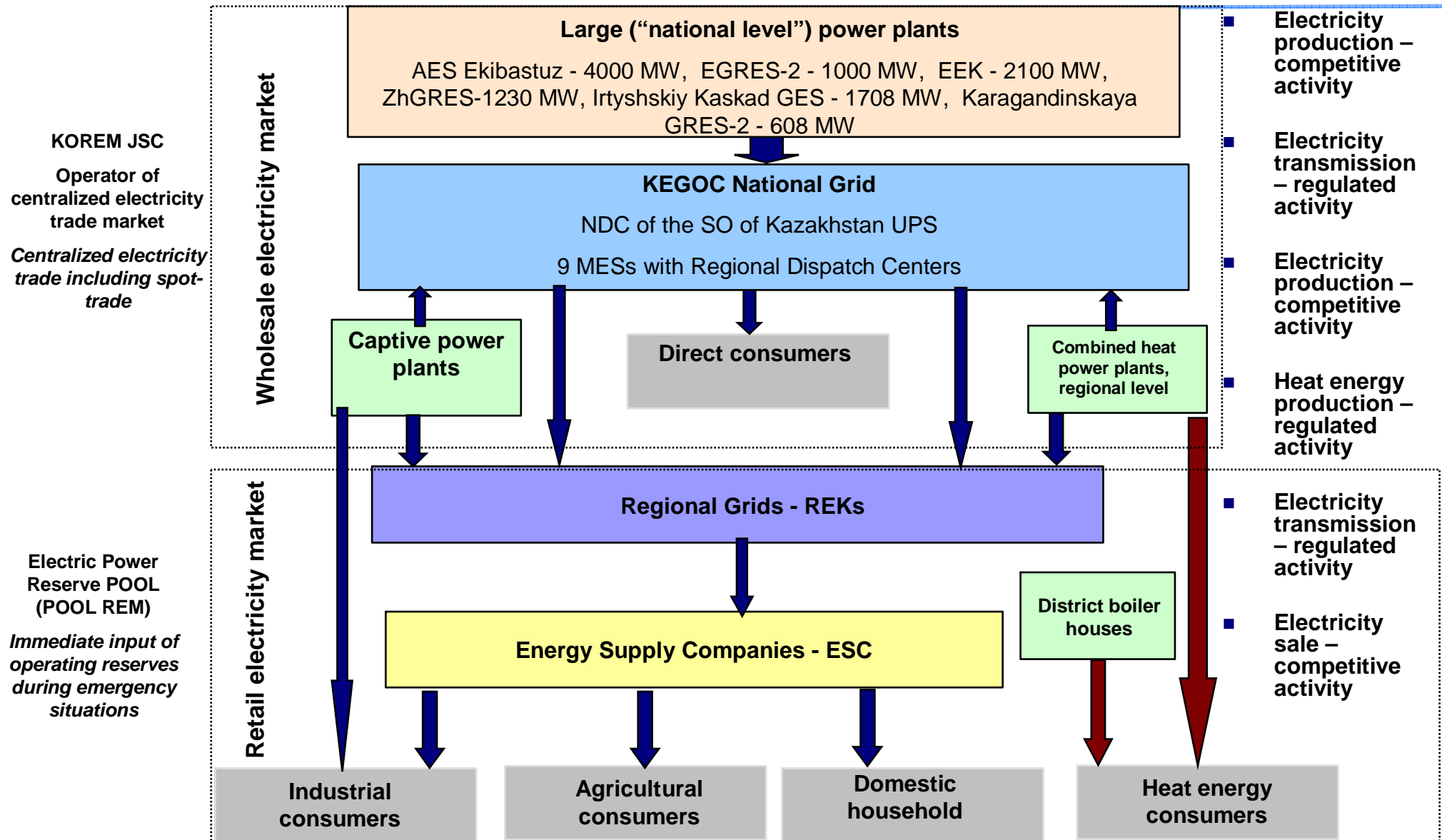
Objective conditions for competition development in the wholesale electricity market are established:

1. The consumer right to choose its own energy supplier is guaranteed;
2. Non-discriminatory access of market players to electricity transmission and distribution services is ensured;
3. Electric energy trade functions have been separated from transmission and distribution;

monopoly – power transmission and distribution

- Kazakhstan Electricity Grid Operating Company JSC (KEGOC JSC) – owns and operates the National Power Grid and exercises duties of the System Operator of Kazakhstan UPS ;
- Regional Power Grid Companies (REKs) – 14 REKs out of 21 were made private;
- Tariffs for electricity transmission and distribution services are governed by the Agency on Regulation of Natural Monopolies.

Structure of Kazakhstan Electric Power Sector



Legal Framework of Kazakhstan Electric Power Sector Functioning in Market Relations

New Electricity Law of the Republic of Kazakhstan has been adopted in 2004:

To improve competitive wholesale electricity market of the Republic of Kazakhstan the following has been established:

1. Bilateral market for electricity purchase-sale (over 90% of the overall electricity trade volumes);
2. Centralized trade market – day-ahead spot trade;
3. System and auxiliary services market;
4. Status, rights and responsibilities of the System Operator of Kazakhstan UPS were defined. The functions of the SO of Kazakhstan UPS are placed on KEGOC JSC. Real-time balancing market for physical and subsequent financial settlement of energy production/consumption imbalances shall be set by 2008.

To develop competition in the retail electricity market :

1. The monopoly function of electricity transmission has been separated from electric energy purchase-sale in REKs;
2. The “guaranteed suppliers” have been appointed to make stable retail trade during transition period;
3. Independent Energy Supply Companies competing with each other for the right to supply energy to end users are establishing .

General information about the Company

- KEGOC JSC has been established according to Government Resolution of the Republic of Kazakhstan No. 1188 dated 28 September 1996 “On certain measures for restructuring of Kazakhstan power system management”;
- The Company includes: National Dispatch Center of the System Operator, 9 Branches of Intersystem Electric Networks (MES), “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:
 - 23.4 ths km of transmission lines,
 - 74 transformer substations with total capacity of 32.4 ths MVA;
- Authorized capital – 75.6 billion tenge;
- State block of shares amounting to 100 % of the total allocated shares has been transferred to “Kazakhstan Holding Company on Government Assets Management “Samruk” JSC”.

Functions of the System Operator

1. Provide system services for:
 - electricity transmission through the National Power Grid;
 - technical dispatching;
 - load-frequency control.
2. Arrange operation in parallel with CIS power systems;
3. Coordinate with the System Operators of neighboring countries power systems the values of energy flows via interstate transmission lines;
4. Manage real-time balance electricity market.

At present the Company implements two large-scale investment projects:

1. Kazakhstan Electricity Transmission Rehabilitation Project
2. Project “Construction of 500 kV Second Transmission Line of Kazakhstan North-South Transit”

Also, the Company participates in the Project “Construction of Interregional Transmission Line “North Kazakhstan - Aktyubinskaya Oblast”

Kazakhstan Electricity Transmission Rehabilitation Project



**Project value – KZT 43.77 billion
including:**

Loan proceeds of IBRD and EBRD - USD 185 million

**Own funds of KEGOC JSC – KZT 17.04 billion (USD 134 million at the
rate of exchange KZT 127/ USD 1)**

Project components

- ✓ Modernization of high-voltage equipment
- ✓ Substation automation and relay protection replacement
- ✓ Installation of Supervisory Control and Data Acquisition and Energy Management System SCADA/EMS
- ✓ Implementation of digital Corporate Telecommunication Network
- ✓ Implementation of Commercial Metering System (CMS)
- ✓ Implementation of Electricity Trading System

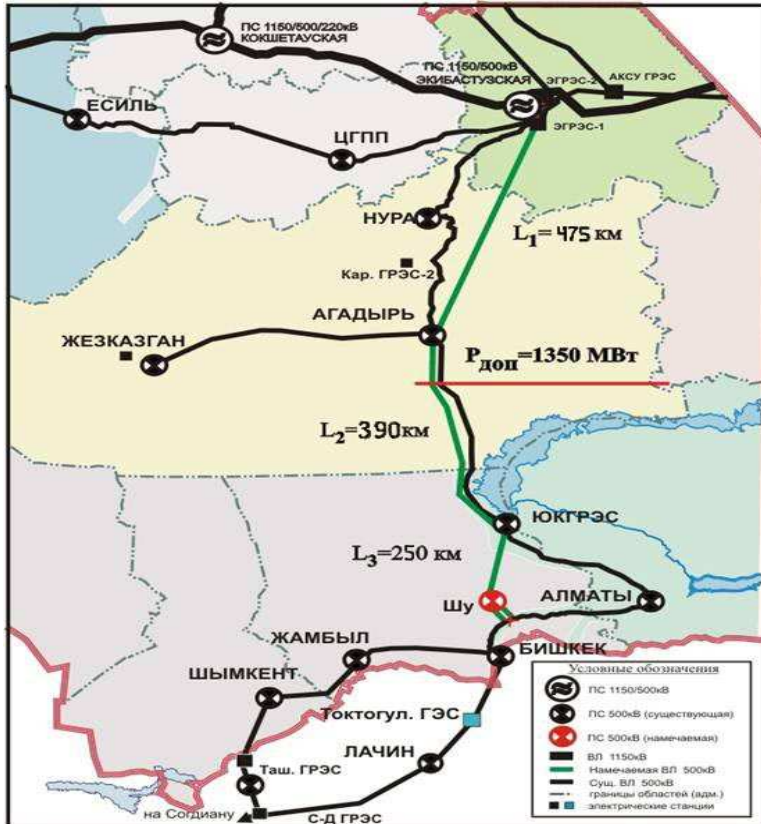
During Project implementation 81.1 % of the funds have been invested in the Project.

Since the beginning of the Rehabilitation Project implementation the following funds have been disbursed:

Loan proceeds – USD 151.76 million

Co-financing of KEGOC – KZT 16.22 billion

Project “Construction of 500 kV Second Transmission Line of Kazakhstan North-South Transit”



Project value – **KZT 41.4 billion**

Route: **Ekibastuz – Agadyr – YuKGRES – Shu**

Construction sections: **Section 1 – YuKGRES – Shu;**
Section 2 – Ekibastuz – Agadyr;
Section 3 – Agadyr – YuKGRES

Line length: **1 115 km**

Implementation period: **2004 - 2009**

Financing sources: **IBRD, EBRD, DBK and KEGOC own funds**

Loan of IBRD – USD 100 million, granted against sovereign guarantee;
 Syndicated loan of EBRD – USD 147.8 million;
 Loan of Development Bank of Kazakhstan – USD 21 mln. and
 KZT 6.97 billion (USD 54.9 mln. at the rate of exchange
 KZT 127/USD 1)

Since the beginning of the Project implementation (from 2004) the following funds have been disbursed:
 of EBRD – USD 28.4 million,
 of DBK – KZT 6 011 million,
 of the Company’s own funds – KZT 1 841 million.
 (in total around 27.6 % of project value)

Project “Construction of Interregional Transmission Line “North Kazakhstan – Aktyubinskaya Oblast”

Concession agreement on the basis of state and private participation was concluded between the Ministry of Energy and Mineral Resources of the Republic of Kazakhstan and “Batys Transit” JSC.

Pursuant to Government Resolution of the Republic of Kazakhstan No. 1008 dated 7 October 2005, the Company, as one of “Batys Transit” JSC shareholders (20 % of authorized capital), participates in the Project implementation.

According to amendments and addenda made to Electricity Law of the Republic of Kazakhstan in April 2006, interregional transmission lines, substations and switchgears of 220 kV and higher, built under concession agreements, will be transferred to the National Grid after the agreements are expired.

Main technical characteristics of Interregional Transmission Line “North Kazakhstan – Aktyubinskaya Oblast” (Zhitikara - Ulke)

- length - 500 km;
- voltage - 500 kV;
- number of circuits - 1;
- transmission capacity - 700 MW;
- project value (FS) - USD 15.7 billion;
- planned commissioning period - 2008.

Kazakhstan Electricity Transmission Rehabilitation Project – Phase 1

5213 units of 110-220-500 kV high voltage equipment were supplied during implementation period of Kazakhstan Electricity Transmission Rehabilitation Project at 54 substations of KEGOC JSC, including:

- Circuit-Breakers – 519 units;
- Disconnect Switches – 2968 units;
- Voltage Transformers – 460 units;
- Current Transformers – 606 units;
- Surge Arresters – 660 units.

Kazakhstan Electricity Transmission Rehabilitation Project - Phase 2

The project involves replacement of 500-220-110-35-10-6 kV high voltage equipment at 59 substations, including:

- Circuit-Breakers – 902 units;
- Disconnect Switches – 957 units;
- Voltage Transformers – 873 units;
- Current Transformers – 1668 units;
- Surge Arresters – 3906 units.

Project also involves installation of shunt reactors and autotransformers, further development of telecommunication network and construction of 220 kV OHTL “

Project estimated value is USD 430 million.

Outlook for future projects – Power Transmission and Distribution

- ✓ Scheme for power delivery from Moinak HPP (USD 76 million);
- ✓ Construction 500 kV OHTL “YuKGRES – Zhambyl” (USD 120 million);
- ✓ Interconnection of West Kazakhstan Power System and Kazakhstan UPS with 500 kV transmission lines to be constructed;
Construction of the first interregional line “North Kazakhstan – Aktyubinskaya Oblast”, is currently in progress;
- ✓ Rehabilitation of 110, 35, 10 and 0.4 kV distribution networks;

Amount of investments to be involved in Transmission and Distribution including Rehabilitation Project (Phase 2) is estimated at USD 4.0 -5.0 billion.



Upgrading of Operating Power Plants

Aksu GRES

2006-2015 – modernization of six 300 MW generating units,

Ekibastuz GRES-1

2007-2015 – rehabilitation of three 500 MW generating units being under closing-down,

Karaganda GRES-2

2007-2015 – capacity restoration and replacement - 695 MW;

Regional level power plants:

2006-2015 – capacity restoration and replacement - 2700 MW

Totally for the period of 2006 - 2015, investments in the upgrading of operating power plants have been estimated as \$1.2 – 2.0 bln.



Construction of new and extension of operating power plants

Within the period up to 2010. Total volume of new capacities commissioning – **1280 MW** with the investments amounting to **more than \$800 mln.**, including:

Moinak HPP – 300 MW

In West Kazakhstan on GTPP and CCGT base – 800 MW

Akmolinskaya CPP-2 – 120 MW; Rudny CPP – 63 MW

Within the period 2010-2015. Total volume of new capacities commissioning – **3300 MW** with the investments amounting to **\$3.500 bln.**, including:

EGRES-2 - 1000 MW (units No.3 and 4)

YuKGRES - 1000 MW

Akmolinskaya CPP-2 - 2 x 120 MW

Akmolinskaya CPP-3 - 2 x 120 MW

Semipalatinsk CPP-3 - 3 x 65 MW

In West Kazakhstan on GTPP and CCGT base – 500 MW

Kerbulak HPP – 50 MW

Bulak HPP – 78 MW

Totally within 2007-2015 commissioning of new generating capacities will make up around **4600 MW** with the estimated investments amounting to **\$4 -5 bln.**



Kazakhstan Hydropower Sector Development Projects

Share of operating HPPs in installed capacity of power plants of the Republic of Kazakhstan	12 %
Used regulating capacity of operating HPPs	4 %
Demand for regulating capacity in UPS of the Republic of Kazakhstan	20 %

Moinak HPP (300 MW, commissioning year – 2010)

Kerbulak HPP – regulating water storage of Kapshagai HPP – 50 MW, (additional increase in capacity at Kapshagai HPP – 160 MW);

Bulak HPP – regulating water storage of Shulbinsk HPP – 78 MW, (additional increase in capacity at Shulbinsk HPP – 500 MW)

Total estimated amount of investments - \$ 600 mln.

Energy potential of small-size and medium-size HPPs

Technical potential of small-size and medium-size HPPs – 11.0 bln. kWh (2,425 MW).
Used potential – 0.32 bln. kWh (0.03 %).