DEVELOPMENT OF THE RENEWABLE ENERGY IN KAZAKHSTAN - THE REGULATORY FRAMEWORK OVERVIEW

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Tashkent, July 11, 2018
NATURAL RESOURCES OF KAZAKHSTAN

• Territory - 2 724 902 km², 9th biggest in the world
• Borders with Russia (north and west), China (east), Kyrgyzstan and Turkmenistan (west)
• Population - 18 157 078 people
• Rich natural resources: oil, gas, coal, uranium,
  ➢ Among top 10 countries with the biggest oil reserves (the Caspian basin - 79% of the proven volume in the total volume of the country)
  ➢ The 1st place in the world for uranium output (40% of the global uranium output)
  ➢ The 8th place in the world for coal reserves (300 years for mining, mainly in the central and northern parts - Ekibastuz, Karaganda)
  ➢ Gas (98% of reserves in Western Kazakhstan, the North Caspian Basin)
• 25 thousand km of National Power Grid (NPG)

• The UPS is conditionally divided into 3 zones: Northern, Southern and Western
  • 220 – 500 kV – National Electricity Grid managed by «KEGOC» JSC
  • Up to 110 kV – Regional Electricity Grid (managed by regional electricity grid companies)
  • As of January 1, 2018 - installed capacity- 21.7 GW
  • As of January 1, 2018 – available capacity-18.8 GW
• Electric power produced in 2017 — 102.3 bln. kWh
• Electric power consumption in 2017 — 97.9 bln. kWh
• Electric power production profile:
  • The power industry is divided into the following sectors: generation, transmission, sales and other activities.
TARIFFS

1. Tariffs for generation are regulated by the Ministry of Energy. All stations are divided into 13 price groups, depending on the capacity, the type of fuel and the distance from the fuel reserves. The maximum tariffs are established for each power plant group and are in effect until 01.01.2019. The ceiling tariffs range from 4.5 KZT/kWh to 15.32 KZT/kWh (1.3 to 4.6 US cents/kWh).

2. Tariffs for transmission (the tariffs of the System Operator KEGOC and regional electric grid companies (REGCs) are regulated by the Natural Monopolies and Competition Protection Committee (NMCPC), as they are natural monopolies, and are approved for 5 years.) The minimum and maximum tariffs for REGCs for 2018 range from 3.08 KZT/kWh to 6.6 KZT/kWh (0.9-2 US cents/kWh).

3. Tariffs for end-users, taking into account the tariffs of energy supplying organizations (ESO), are regulated by the NMCPC. The minimum and maximum tariffs range from 11.1 KZT/kWh to 17.96 KZT/kWh. (3.3 - 5.4 US cents/kWh). In addition to the cost of power generation, additional tariffs are applicable for end-users:
   - for transmission, dispatching and balancing (KEGOC)
   - for transmission and distribution in regional networks (REGCs)
   - electricity market costs (KOREM)

   • Note: the exchange rate of the National Bank of the Republic of Kazakhstan as of 05.06.2018 is 330.73 USD/KZT
RE RESOURCE POTENTIAL

- Wind power - 920 billion kWh / year
- Hydro power potential - 62 billion kWh / year
- Solar power - 2.5 billion kWh per year, (the number of solar hours is 2.5 - 3 thousand solar hours per year out of 8760 hours).
- The thermal potential of geothermal waters is 4.3 GW.
RES DEVELOPMENT STRATEGIES AND TARGETS

• Strategy "Kazakhstan - 2050" (December 2012)

• The concept of the development of the fuel and energy complex of Kazakhstan until 2030.

• Decree of the Government of the Republic of Kazakhstan No. 724 dated June 28, 2014

• Decree of the President of the Republic of Kazakhstan on the Concept on the transition of the Republic of Kazakhstan to the "green economy" No. 577 dated May 30, 2013

  ➢ 2020 - 3% of electricity production from RES (wind and solar)
  ➢ 2030 - 10% of electricity production from RES (wind and solar)
  ➢ 2050 - 50% of alternative energy (RES and nuclear).
  ➢ Decrease of GDP energy intensity below 2008 levels: 2020 - 25%, 2030 - 30%, 2050 - 50%

• Renewable energy sector target indicators (Ministry of Energy Order No. 478, 2016). The total installed capacity of renewable energy facilities until 2020 is 1,700 MW, including:

  ❑ Wind power plants - 933 MW
  ❑ Solar power plants using photovoltaic solar energy converters - 467 MW
  ❑ Hydro power plants - 290 MW
  ❑ Biogas plants - 10 MW.
RES STATISTICS

The number of renewable energy facilities as of 2018

59 operating RES facilities
- WPP- 12
- SPP- 18
- HPP - 27
- Biogas plant - 1

The installed capacity (as of Q1 2018) - 352.5 MW:
- WPP- 121.45 MW
- Small hydro power plants - 173.2 MW
- SPP- 57.5 MW
- Biogas plant- 0.3 MW

At the end of 2018, 68 projects are expected with a total capacity of 490 MW.

Electricity generation in 2017 - 1102.4 million kWh (1.08%)
- WPP- 339 million kWh
- Small HPPs - 649.1 million kWh
- SPP- 114.3 million kWh
- Biogas plant – 0.06 mln. KWh

The largest projects:
- First WPP - 45 MW
- SPP-Burnoe Solar 1 - 50 MW
- SPP- Burnoe Solar 2 - 50 MW
- Korinskaya HPP - 28.5 MW
- Lepsi HPP - 16.9 MW
PUBLIC AUTHORITIES AND ORGANIZATIONS

- Ministry of Energy of the Republic of Kazakhstan
- Ministry of Investment and Development of the Republic of Kazakhstan
- Committee for the Regulation of Natural Monopolies, Competition and Consumer Rights Protection of the Ministry of National Economy of the Republic of Kazakhstan
- "Kazakhstan Electricity Grid Operating Company" JSC (KEGOC)
- "Kazakhstan Electricity and Power Market Operator" JSC (KOREM)
- "The Financial Settlement Center for Support of Renewable Energy Sources" LLP (the FSC for RES)
- "National Company "KAZAKH INVEST" JSC
- Local executive body (Akimat)
- Land Relations Office
- Architecture and Urban Planning Office
- Natural Resources Office
- Committee for Environmental Regulation and Control
INTERNATIONAL COOPERATION

**UNDP / GEF - United Nations Development Program / Global Environmental Fund**

2007 - Atlas of wind resources of Kazakhstan

2017 - Atlas of solar resources of Kazakhstan

2018 - "Reducing the risks of investing in renewables" Project
INTERNATIONAL COOPERATION

EBRD - European Bank for Reconstruction and Development

1) Technical assistance projects to improve legislation and enable investment in RES

2) Financing of renewable energy projects
   1) Solar plant "Burnoe-1", 50 MW
   2) Solar power plant "Burnoe-2", 50 MW
   3) Wind power plant near Erejmentau, 50 MW
   4) Solar power plant at Baikonur, 50 MW. (jointly with ADB and CTF)
   5) Solar power plant "Zadaria", 14 MW in Arys city

3) The Green Climate Fund (GCF) in 2018 allocated 110 million USD to support the EBRD program for financing renewable energy projects in Kazakhstan.
INTERNATIONAL COOPERATION

ADB - Asian Development Bank Technical Assistance

- Technical assistance for implementation of the auction mechanism for RES projects in Kazakhstan and RES integration into the System
- Regional cooperation in the field of RES integration into the System

IRENA

- Road map for the development of global renewable energy until 2030 (Remap 2030)

IFC - International Finance Corporation

- Technical assistance projects to improve the regulatory framework for investment in renewable energy projects

USAID Power the Future Regional program under the C5 + 1 initiative
INVESTMENT PREFERENCES

• The Entrepreneurial Code and other legislation of the Republic of Kazakhstan provides for the following types of investment preferences (subject to certain conditions):
  1. Exemption from customs duties
  2. Exemption from value added tax for imports,
  3. State in-kind grants (land plots, buildings, structures, machinery and equipment, computers, measuring and regulating devices and tools, vehicles)

• Electricity production (OKED - 3511) is included in the List of priority types of activities for investment projects.
LEGAL BASIS FOR RES DEVELOPMENT

The Law on the Support of RES dated 2009 (as amended on 01/01/2018).

Decrees of the Government and Orders of the Ministry of Energy (20)

State regulation in the field of RES support includes:

a. Establishment of targets for the development of renewable energy sources
b. Approval and implementation of the RES facilities siting plan taking into account the RE sector development targets;
c. Establishment of feed-in tariffs (June 2014) and ceiling auction prices (July 2017)
d. Provision of targeted social assistance to individual consumers;
e. Provision of investment preferences,
f. Reservation of land plots for the construction of renewable energy facilities;
g. Monitoring the use of RES;
h. Appointment of the FSC as an off-taker single buyer of electricity produced from RES (2015);
LEGAL BASIS FOR RES DEVELOPMENT

State regulation and support of renewable energy also includes:

a. Establishment of a requirement for mandatory purchase of electricity produced from RES by the FSC (2015)

b. The approval of a standard PPA with the FSC (March 2015) and the obligation to conclude the agreement with the FSC within 60 calendar days after inclusion in the List of energy producing organizations

c. Introduction of the obligation for "conditional consumers" to purchase energy generated from renewable energy sources

d. Introduction of a standard grid connection agreement (July 2016)

e. Rules for the preparation of the RES facilities siting plan (July 2016)

f. Rules for inclusion in the list of renewable energy projects (November 2016)

g. Exemption from payment for transmission services for electricity generated from renewable energy sources

h. Priority dispatching of electricity from renewable energy sources

i. Annual indexation (70% for the exchange rate changes, 30% for the CPI - the consumer price index) (May 2018)
<table>
<thead>
<tr>
<th>No.</th>
<th>RES technology</th>
<th>FIT in KZT/kWh (net of VAT)</th>
<th>FIT in US cents/kWh (net of VAT)</th>
<th>Cap tariffs KZT/kWh (net of VAT) From July 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wind power plants, except as specified in cl. 1-1</td>
<td>22.68</td>
<td>6.8</td>
<td>22.68</td>
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<tr>
<td>1-1</td>
<td>The wind power plant &quot;Astana EXPO-2017&quot; with the capacity of 100 MW</td>
<td>59.7</td>
<td>18</td>
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<tr>
<td>2</td>
<td>Solar PV installations, except as specified in cl. 2-1</td>
<td>34.61</td>
<td>10</td>
<td>34.61</td>
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<td>2-1</td>
<td>Solar PV installations using KazPV modules (based on Kazakhstan silicon)</td>
<td>70.00</td>
<td>21</td>
<td></td>
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<tr>
<td>3</td>
<td>Small HPPs</td>
<td>16.71</td>
<td>5</td>
<td>16.71</td>
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<tr>
<td>4</td>
<td>Biogas</td>
<td>32.23</td>
<td>9.7</td>
<td>32.23</td>
</tr>
</tbody>
</table>
GRID CONNECTION

- An application to the grid company (KEGOC or REGC) for allocation of the nearest connection point
- Development of a power distribution scheme by the investor (for facilities with a capacity of 5 MW or more)
- Approval of the power distribution scheme (KEGOC, REGC)
- Application for technical specifications (over 10 MW - approval of KEGOC)
- Technical specifications (validity - 3 years)
- The conclusion of the grid connection agreement (Tech. Spec. and the Scheme of power distribution are attached)
- Conclusion of a standard contract for technical dispatching with the System Operator (NDC).
- Activities for ensuring compliance with the technical conditions and costs associated with the construction of a network from a RES facility to a connection point are paid by the investor, the owner of the RES facility.
MAIN STAGES OF RES PROJECTS DEVELOPMENT

1. Obtaining the land plot title
2. Solving the grid connection issues (based on pre-feasibility study)
3. Participation in auctions for the selection of renewable energy projects (since 2018).
4. Inclusion in the Renewable energy facilities siting plan
5. Inclusion in the List of energy producing organizations that use RES
6. Conclusion of the PPA (Power Purchase Agreement)
7. Development and approval of a feasibility study and / or detailed design (including pre-EIA and EIA).
8. Implementation of RES project (construction and installation)
9. Comprehensive tests, delivery and operation.
EXISTING BARRIERS

• The standard power purchase agreement requires considerable improvement.

• Solvency and creditworthiness of the FSC as an off-taker single buyer of electricity produced from renewable energy sources is not guaranteed.

• The procedure for providing connection to grids, contracts and quality assurance entail risks for investors.

• The issues of obtaining a land plot shall be further finalized.

• The process and conditions for conducting the auction require are not perfect (there are no auction pre-qualification stage, requirements for experience in the sector, confirmation of financial stability, technical requirements and equipment specifications, auction product under the power purchase agreement, etc.).

• Institutional capacity shall be strengthened.

• No long-term integrated planning to achieve the RES targets.

• Project monitoring requires improvement.

All of the above, as well as other barriers, create risks for bank financing and private foreign investment in RES projects.
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