TAJIKISTAN’S HYDRO POWER POTENTIAL

MFA, Tajikistan-2011
I. WATER RESOURCES

Leading position in water formation in Amu-Darya and Syr-Darya Basins

in average 64km³ per year

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tajikistan</td>
<td>55.4%</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>25.3%</td>
</tr>
<tr>
<td>Afghanistan and Iran</td>
<td>7.8%</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>7.6%</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>3.95%</td>
</tr>
</tbody>
</table>
II. HYDROPOWER RESOURCES

Unique Hydro Energy Resources

- Second Among CIS Countries

- Eights in the World
  4% of World’s resources that is equal to 527 billion kWh in one year

This is 3 times more than present annual consumption of energy in Central Asia.
III. CURRENTLY INSTALLED CAPACITIES

Currently installed capacity of hydro power plants (HPP) is 4741 thousand kW;

Main Hydro Power Plants:

<table>
<thead>
<tr>
<th>Name</th>
<th>Installed Capacity in thousand kW</th>
<th>Energy generation in Mln. kWh annually</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norak</td>
<td>3000</td>
<td>11200</td>
</tr>
<tr>
<td>Boyghozi</td>
<td>600</td>
<td>3500</td>
</tr>
<tr>
<td>Sangtuda-1</td>
<td>671</td>
<td>2700</td>
</tr>
<tr>
<td>Sarband</td>
<td>210</td>
<td>1300</td>
</tr>
</tbody>
</table>
All four abovementioned HPP are on Vakhsh River.

There is also Qayroqum HPP in the northern part of the country on the river Syr Darya, with an installed capacity of 126 MW.
IV. FUTURE PLANS/PROJECTS

A) CONSTRUCTION OF NEW HPP

HPPs UNDER CONSTRUCTION:

1. ROGHUN

2. SANGTUDA-2
IV. FUTURE PLANS/PROJECTS, CONTINUE

ROGHUN HPP

- THE BIGGEST HYDRO POWER PLANT IN CENTRAL ASIA WITH DAM HEIGHT OF 335M.
- CONSTRUCTION STARTED IN 1976.
- THE ESTIMATED CAPACITY OF ITS 6 GENERATORS IS 3600 MW, OR 13.1 BLN. KWH ANNUALLY.
**IV. FUTURE PLANS/PROJECTS, CONTINUE**

**SANGTUDA-2 HPP**

- **CONSTRUCTION STARTED IN 2006.**
- **THE ESTIMATED CAPACITY OF ITS 4 GENERATORS IS 220 MW, OR 0.9 BLN. KWH ANNUALLY.**
- **THE PROJECT IS FULLY FINANCED AND IS BEING IMPLEMENTED BY I.R. IRAN ACCORDING TO THE MOU SIGNED BETWEEN THE GOVERNMENTS OF TAJIKISTAN AND IRAN.**
Among others, Dashtijum HPP is the most attractive with its capacity of 4000 MW, and 17.6 km$^3$ water basin.
### Preliminary Economic And Technical Characteristics of Dashtijum HPP:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of the project, bln. USD</td>
<td>3.2 USD</td>
</tr>
<tr>
<td>Dam’s height, m.</td>
<td>320 m</td>
</tr>
<tr>
<td>Reservoir ‘s capacity, mln. m³: total</td>
<td>17.6 mln. m³</td>
</tr>
<tr>
<td></td>
<td>needed</td>
</tr>
<tr>
<td>Length of reservoir, km</td>
<td>70 km</td>
</tr>
<tr>
<td>Projected capacity of the plant, MW</td>
<td>4000 MW</td>
</tr>
<tr>
<td>Annual energy generation, kWh</td>
<td>15.6 bln. kWh</td>
</tr>
<tr>
<td>Cost of investment per 1 kW</td>
<td>USD 800</td>
</tr>
</tbody>
</table>
4. Other rivers

Kofarnihon River: 5 stations, with general capacity of 411 MW;

Varzob River: 3 stations, with general capacity 100 MW;

Zarafshon River: 6 stations, with general capacity of 640 MW;

Fon Daryo River: 4 stations, with general capacity of 510 MW;

Mascho District’s rivers (Upstream of Zarafshon): 5 stations, with general capacity of 500 MW;
FUTURE PLANS OF TAJIKISTAN ON POWER TRANSMISSION LINES
There are number of projects for diversification of power transmission lines being implemented or are under consideration.
FUTURE PLANS/PROJECTS

CASA 1000
Interconnection of Kyrgyzstan, Tajikistan, Afghanistan and Pakistan

Kyrgyzstan and Tajikistan

Afghanistan and Pakistan
Relevant agreement on development of the CASA 1000 Power Transmission Line Project among Tajikistan, Afghanistan, Kyrgyzstan and Pakistan was signed on August 4, 2008 in Islamabad. At present Parliaments of Tajikistan and Afghanistan have ratified current document. Feasibility study of the Project is being conducted by international consultants.
The length of power transmission line is 750 km, including:

- AC Transmission Line Between Kyrgyzstan and Tajikistan
- 1300MW AC/DC Transformer station in Sangtuda (Tajikistan)
- 300MW DC/AC Transformer station in Kabul (Afghanistan)
- 1000MW DC/AC Transformer station in Peshawar (Pakistan)
Facilities Under Construction
- 500 kV OHL South-North
  Financing: China Exim bank
- Sangtuda 1 HPP
  Financing: Russia
- Sangtuda 2 HPP
  Financing: Iran
- 220 kV OHL SS Sarban – Tajik/Afghan border
  Financing: ADB/IsDB

Existing Facilities
- Toktogul HPP
- Nurek HPP

Perspective Facilities
- 500 kV HVAC TL Uzbek by pass SS
  Datka (Kyrgyz) – SS Hojent (Tajik)
- Cascade of Zarafshan HPPs
  (Yavan and Oburdon HPP)
  Annual generation 1680 GWh
- Rogun HPP
  Annual generation 13000 GWh
- Coal TPP
  Annual generation 3900-6400 GWh
- 500 kV HVDC TL “CASA 1000”
- Nurek HPP – Kabul – Peshawar
FUTURE PLANS/PROJECTS

Sangtuda - Puli Khumri (Afg.)

A double-circuit 220 kV transmission line with capacity of 300 MW.
According to preliminary studies it would be 500kV AC transmission line or DC line with capacity of more than 1000MW.

Feasibility study of the project is being prepared by Tajik and Iranian experts.
The END