Investment Opportunities in Energy Sector in Afghanistan

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Power Generation and Transmission Profile

**AfghanistanInstalled Generation Capacity (MW)**
- Hydro: 35.34%
- Thermal (Fuel Diesel/HFO): 11.48%
- Diesel Generator (Gen.Set): 3.00%
- Solar: 0.18%

**Transmission Capacity for Power Imports (MW)**
- Republic of Uzbekistan: 335 MW
- Islamic Republic of Iran: 164 MW
- Republic of Tajikistan: 433 MW
- Republic of Turkmenistan: 80 MW

**Installed Generation Capacity (MW)**
- Hydro: 300 MW
- Thermal (Fuel Diesel/HFO): 200 MW
- Diesel Generator (Gen.Set): 65 MW
- Solar: 1 MW

**Total**: 566 MW
<table>
<thead>
<tr>
<th>No</th>
<th>Type</th>
<th>Potential</th>
</tr>
</thead>
</table>
| 1  | Hydro Power           | • 23,000MW of Energy  
• 125 sites been identified for MHP, with potential of over 600MW of electricity |
| 2  | Wind Energy           | • 158,500 MW installed capacity i.e. 5MW/km²  
• 31,600km² windy land area i.e. 5% of Afg. total land area |
| 3  | Solar Energy          | • 300 Sunny day in one year, i.e. 3,000 Hours of Sun  
• 6.5 kWh/m² per day solar radiation average |
| 4  | Bio-Mass              | • More than 85% of Afghanistan’s energy needs are met by traditional biomass, mainly wood and dung |
| 5  | Geo-Thermal Energy    | • Prospects of low to medium temperature geothermal resources are widespread all over Afghanistan.  
• Power plants to be built in Afghanistan could range from 5 to 20MW each |
| 6  | Gas and Coal          | • 3000 MW* – 4000 MW*  
• Prefeasibility Studies, Sites Identification of coal power plants  
• 8 out of 12 gas wells been surveyed  
• 440 bcm of proven gas reserves in the northern and western regions  
• 73 million tons of coal reserves in its central highlands |
## Afghanistan—Potential Generation Projects

<table>
<thead>
<tr>
<th>No.</th>
<th>Projects</th>
<th>Brief Description</th>
<th>Key Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Surobi 2 HPP</td>
<td>The Surobi 2 hydroelectric project downstream of the Surobi 1 HPP will have an installed capacity of 180 MW and average annual energy production of 890 GWh.</td>
<td>The project will help meet both base load and peak load demand in the Kabul Zone besides mobilizing domestic renewable water resources.</td>
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<tr>
<td>2</td>
<td>Kunar A HPP</td>
<td>The proposed 386 MW Kunar A hydropower project will be located on the Kunar River about 7 km of Asmar and have a regulation reservoir with an active storage capacity of 1.0m m³.</td>
<td>The project will help to meet local electricity demand better in the Kunar valley.</td>
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<tr>
<td>3</td>
<td>Kunar B HPP</td>
<td>The Kunar B hydropower project is located on the Kunar River about 22 km upstream of Asmar. It has a regulation reservoir with a storage capacity of 7.0m m³ and a 105 m high earth fill dam.</td>
<td>This project will improve overall power situation in Afghanistan.</td>
</tr>
<tr>
<td>4</td>
<td>Baghdara HPP</td>
<td>Baghdara HPP is a storage-based project located on the Panjshir River. The installed capacity is 210 MW and the average annual energy production is 967 GWh.</td>
<td>The Project will provide power to Kabul, Parwan, Kapisa and Panshir Provinces. Also the project will increase the capacity of Srobi 1 and 2 Hydro power as well as provide clean water to New Kabul City.</td>
</tr>
<tr>
<td>5</td>
<td>Gulbahar HPP</td>
<td>Gulbahar HPP is located on the Panjshir River approximately 1.5 km upstream of Gulbahar city having regulation reservoir capacity of 0.760m m³.</td>
<td>Multipurpose project facilitating water use for irrigation and electricity generation.</td>
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<td>6</td>
<td>Kajaki Addition HPP</td>
<td>Additional unit of Kajaki HPP will generate 100 MW with the installation of second power house</td>
<td>The project aims to increase the active storage capacity from 1.7m m³ to 2.7mm³.</td>
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</table>
## Potential Generation Projects ..contd.

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<td>7</td>
<td>Kukcha HPP</td>
<td>Proposed 445 MW HPP along the Kukcha River in the north-east with an annual average energy production of 2238 GWh</td>
<td>This project helps to meet the demand in Faizabad</td>
</tr>
<tr>
<td>8</td>
<td>Kama HPP</td>
<td>The Kama hydroelectric plant will be located on the Kunar River immediately upstream of its confluence with Kabul River. Proposed installed capacity is 145 MW</td>
<td>Multipurpose project facilitating water use for irrigation and electricity generation.</td>
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<td>9</td>
<td>Sheberghan TPP</td>
<td>Proposed 200 MW plant would be tied into the NWPS grid and will draw from the existing natural gas wells</td>
<td>The project will help diversify the current energy mix.</td>
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<tr>
<td>10</td>
<td>Kilagai HPP</td>
<td>Kilagai HPP is an irrigation and power supply project. It will benefit people in Baghlan province.</td>
<td>The project will ensure reliable supply of water for irrigating land; provision of water to newly irrigate; hydropower generation of 60 MW to benefit producers and consumers</td>
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<tr>
<td>11</td>
<td>Olambagh HPP</td>
<td>The Olambagh hydropower project is located on the Helman River in Kandahar Province. The installed capacity is 3 x 30 MW and the average annual energy production is 443 GWh</td>
<td>It will ensure better electricity supply in adjoining regions</td>
</tr>
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<td>12</td>
<td>Naglu MW Solar PV</td>
<td>The project proposed installed capacity is 100 MW</td>
<td>It will help diversify the fuel mix bringing in additional RE generation.</td>
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<tr>
<td>13</td>
<td>Renewable Energy Package</td>
<td>500 MW capacity 30 Projects in 20 Provinces</td>
<td>Most of the projects are off-grid systems ranges from 1 MW to 100 MW</td>
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Reginal Projects

- **Turkmenistan-Uzbekistan-Tajikistan-Afghanistan-Pakistan (TUTAP) Transmission Line**
  - Construction of 500 kV TL from the Turkmen border to Kabul and associated substations and DC/AC converter stations.

- **Kabul to Kandahar Transmission Line**
  - Construction of a 490 km 220 kV line from Arghandi to Kandahar including seven substations and reactive power compensation.

- **CASA 1000 Project**
  - Two AC-DC Convertor Stations (Tajikistan and Pakistan)
  - 560 km TL
  - Back to Back 500 kV Substation

- **TAP Project**
  - Turkmenistan, Afghanistan and Pakistan TL with the capacity of up to 2000 MW
Investment Requirement – Afghanistan Energy Sector

Total investment requirement for power generation and transmission projects in Afghanistan is estimated at USD 9,514 Million.
Action Plan for Facilitating Investments

- **Unbundling and Institutional Strengthening** - Unbundle of existing energy structure so that clear accountability can be allocated to various functions like generation, transmission, load dispatch, distribution and trading.

- **Establishment of Single National Grid** - A single integrated grid will be established and clear regulations should be in place for efficient operation of the grid.

- **Establishment of Regulatory Framework** - Electricity Law has emphasized the need for establishment of Afghanistan Electricity Regulatory Authority (AERA) to regulate the Electricity Services market and to assure a properly functioning market for such Electricity Services.

- **Promotion of Renewable Energy** - To promote renewables and provide a clear vision, clear and tangible targets for RE Generation fixed along with associated plan to meet the targets with affordable price. A Separate Renewable Energy cell developed under DABS to promote renewable energy.

- **Other Incentives for Private Investors** - Long Term Land Lease, Attractive Tariff, Security Assistance, Public Private Partnership (PPP) opportunities and Good incentive Plan
THANKS FOR YOUR ATTENTION