



1ST ENERGY INVESTMENT FORUM
24 OCTOBER 2016 • ISLAMABAD, PAKISTAN

1-ый ИНВЕСТИЦИОННЫЙ ФОРУМ ПО ЭНЕРГЕТИКЕ
24 ОКТЯБРЯ 2016 г. - ИСЛАМАБАД, ПАКИСТАН

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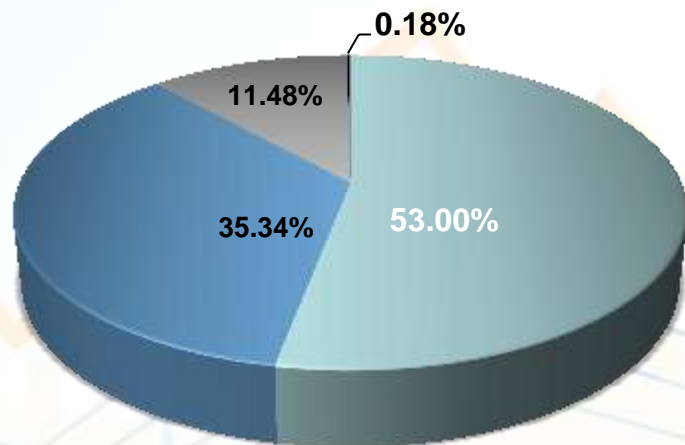
Investment Opportunities in Energy Sector in Afghanistan

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Power Generation and Transmission Profile

Afghanistan Installed Generation Capacity (MW)

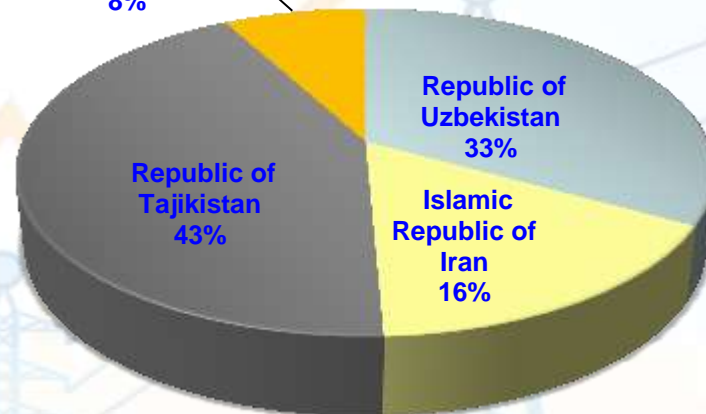
- Hydro
- Diesel Generator (Gen.Set)
- Thermal (Fuel Diesel/HFO)
- Solar



Hydro	300 MW
Thermal (Fuel Diesel/HFO)	200 MW
Diesel Generator (Gen.Set)	65 MW
Solar	1 MW
Total	566 MW

Transmission Capacity for Power Imports (MW)

Republic of Turkmenistan
8%



Republic of Uzbekistan	335 MW
Islamic Republic of Iran	164 MW
Republic of Tajikistan	433 MW
Republic of Turkmenistan	80 MW
Total	1,012 MW

No	Type	Potential
1	Hydro Power	<ul style="list-style-type: none"> • 23,000MW of Energy • 125 sites been identified for MHP, with potential of over 600MW of electricity
2	Wind Energy	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • More than 85% of Afghanistan's energy needs are met by traditional biomass, mainly wood and dung
5	Geo-Thermal Energy	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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

No.	Projects	Brief Description	Key Benefits
1	Surobi 2 HPP	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	The project will help meet both base load and peak load demand in the Kabul Zone besides mobilizing domestic renewable water resources.
2	Kunar A HPP	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 m ³	The project will help to meet local electricity demand better in the Kunar valley
3	Kunar B HPP	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 m ³ and a 105 m high earth fill dam	This project will improve overall power situation in Afghanistan
4	Baghdara HPP	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.	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.
5	Gulbahar HPP	Gulbahar HPP is located on the Panjshir River approximately 1.5 km upstream of Gulbahar city having regulation reservoir capacity of 0.760m m ³	Multipurpose project facilitating water use for irrigation and electricity generation.
6	Kajaki Addition HPP	Additional unit of Kajaki HPP will generate 100 MW with the installation of second power house	The project aims to increase the active storage capacity from 1.7m m ³ to 2.7mm ³ .



Potential Generation Projects ..contd.

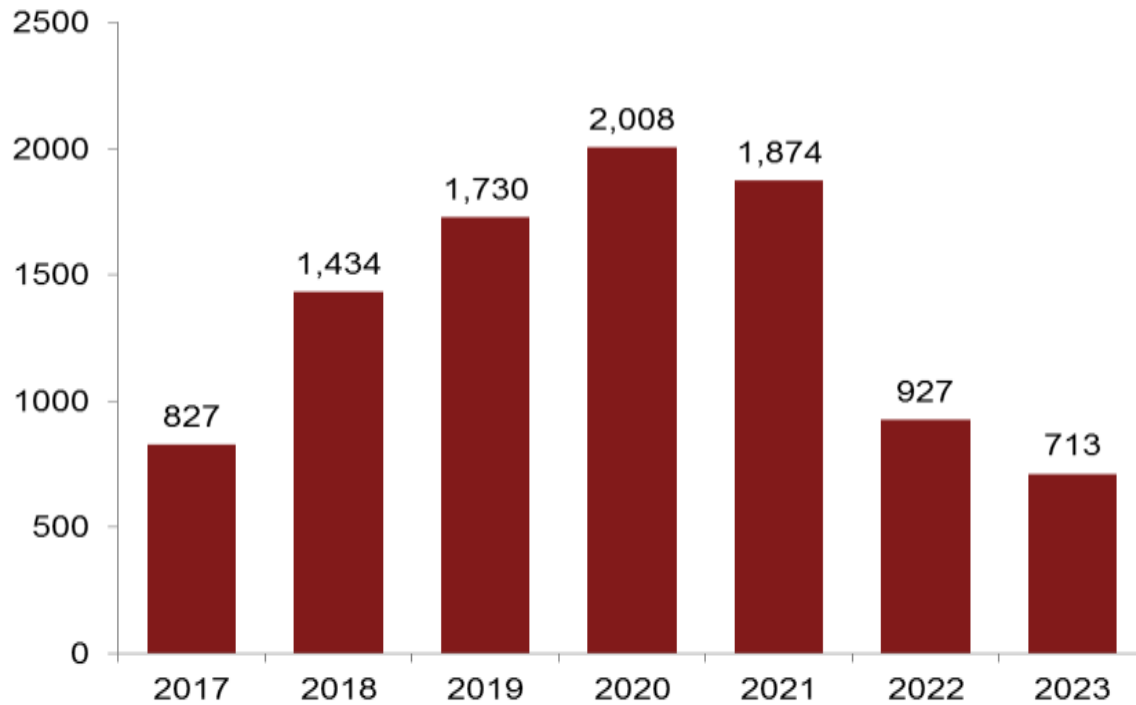
No.	Projects	Brief Description	Key Benefits
7	Kukcha HPP	Proposed 445 MW HPP along the Kukcha River in the north-east with an annual average energy production of 2238 GWh	This projects helps to meet the demand in Faizabad
8	Kama HPP	The Kama hydroelectric plant will be located on the Kunar River immediately upstream of its confluence with Kabul River. Proposed installed capacity is 145 MW	Multipurpose project facilitating water use for irrigation and electricity generation.
9	Sheberghan TPP	Proposed 200 MW plant would be tied into the NWPS grid and will draw from the existing natural gas wells	The project will help diversify the current energy mix.
10	Kilagai HPP	Kilagai HPP is an irrigation and power supply project. It will benefit people in Baghlan province.	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
11	Olambagh HPP	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	It will ensure better electricity supply in adjoining regions
12	Naglu MW Solar PV	The project proposed installed capacity is 100 MW	It will help diversify the fuel mix bringing in additional RE generation.
13	Renewable Energy Package	500 MW capacity 30 Projects in 20 Provinces	Most of the projects are off-grid systems ranges from 1 MW to 100 MW

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 Converter 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

Overall Investment requirement by year in USD Mn (2017-2023)



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



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THANKS FOR YOUR ATTENTION