

**DABS – CEO Presentation;
Abdul Razique Samadi.**

Afghanistan Strategies on Renewable Energy
16th CAREC-ECSS/CCC Meeting



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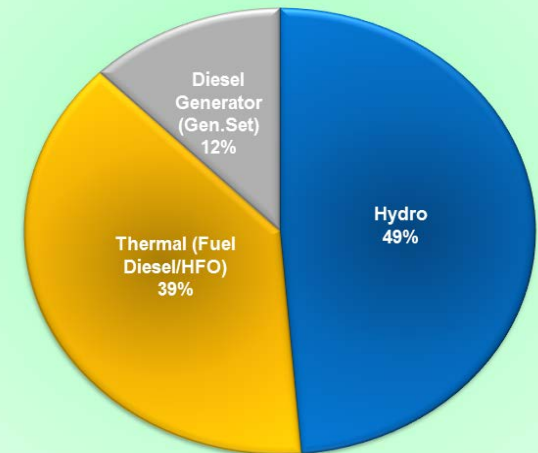
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1. Afghanistan Power System Development

Afghanistan Power System Development

- ✓ Power generation in Afghanistan is mainly hydro based.
- ✓ Access to electricity in the major economic hubs has improved significantly.
- ✓ More than 75% of the population in Kabul, Herat, Mazar-e Sharif, Kunduz, Zarange, Aybak, Maymana and Pul-e Khumri have a 24-hour power supply for the first time in decades.
- ✓ Kabul for example, had 6% of households connected in 2001 to more than 75% in 2013.

Afghanistan Power Plants Installed Capacity in MW



Afghanistan Power System Development (Cont.)

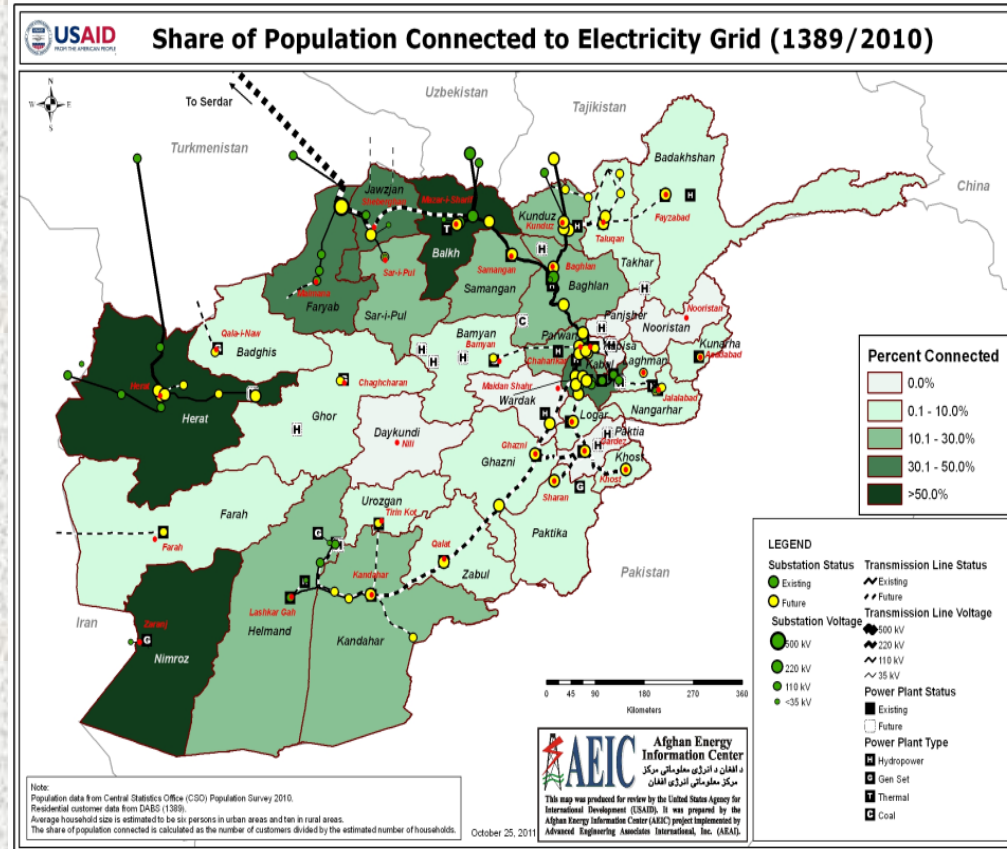
- ✓ The rapid growth of house holds with access to electricity has been driven by the availability of additional energy's imports.
- ✓ The energy's imports in 2011-2012 represented 75% of the total supply while only 40% in 2006-07.
- ✓ This is the result of the construction of North East Power System (NEPS), transmission system, that interconnects Uzbekistan and Tajikistan to Afghanistan and the expansion of the Distribution Network
- ✓ DABS customers connected to the National Grid have increased on more than 60% within the last 6 years.

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2. Afghanistan Energy Conditions

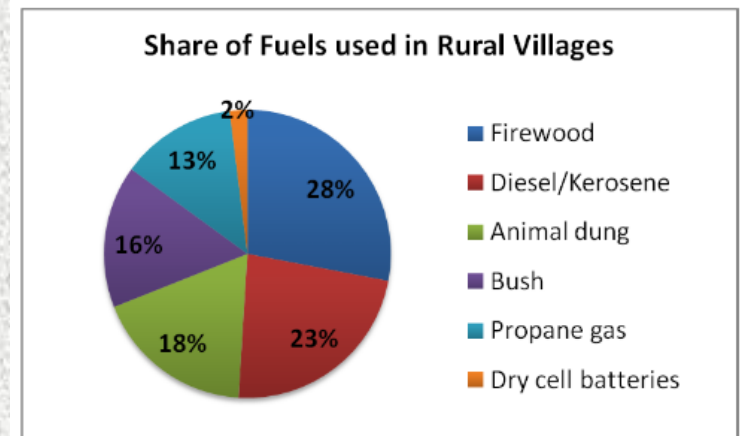
Afghanistan Energy Condition

- Despite these achievements, only 45% of the population has access to electricity, heavily concentrated in the cities.
- In the rural areas the access to electricity is about 9%.
- Afghanistan has an area of 652,230 square kilometers.
- A population estimated about 30 million.



Afghanistan Energy Condition

- Due to the extension of the territory, electrification by means of the National Grid expansion is not an economic solution but also off-grid rural electrification.
- Rural areas relies on self-supplied energy sources, using wood, dung and other biomass for fuel.
- Access to Electricity is the sustainable development for:
 - Poverty eradication
 - Employment creation
 - Sustainable livelihoods
 - Empowerment of women
 - Protection and regeneration of the environment



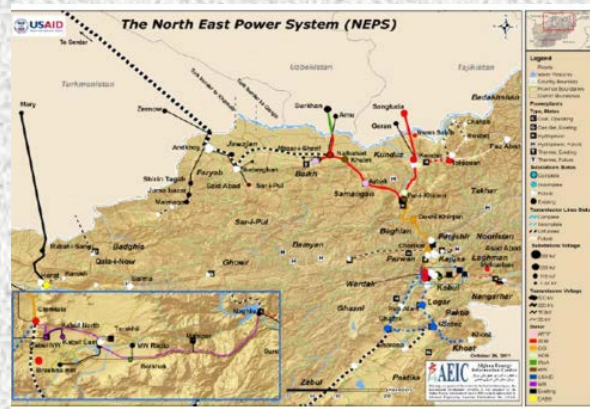
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3. Afghanistan Strategies on Renewable Energy and Policy
 - Guiding Principles
 - Legal Framework

Afghanistan Strategies on Renewal Energy and Policy

Aware of the energy conditions in Afghanistan, the Government of Islamic Republic of Afghanistan, GIRoA, has its priority to raise the percentage of the population with access to electricity using its natural resources by:

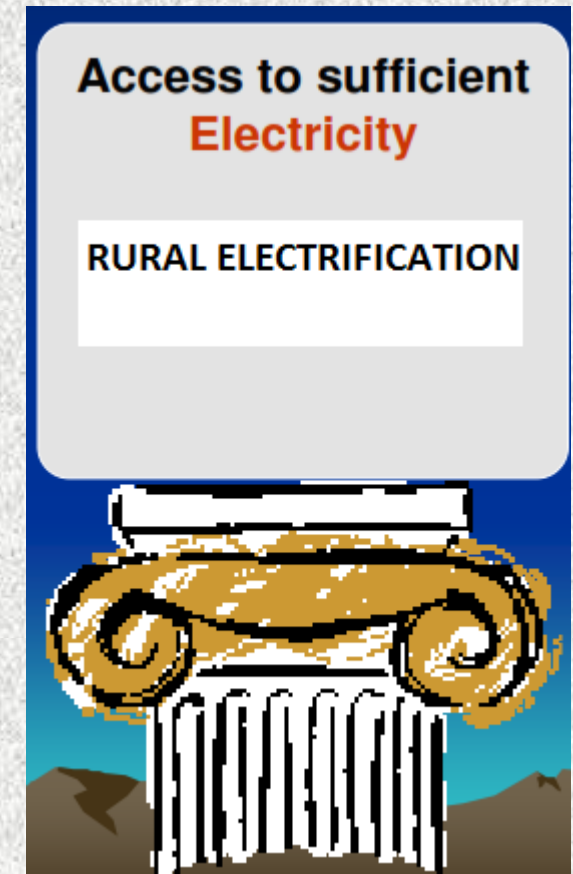
- ✓ Expanding the National Grid when economically viable, and
- ✓ Developing off-grid systems with a full menu of renewable energy options suitable for micro-electric power technologies.



Afghanistan Strategies on Renewal Energy and Policy (Cont.)

The Renewal Energy Policy is being developed recognizing:

- Government alone cannot address a massive electrification.
- There is a need to involve the private sector and create public private partnerships in generation and service delivery.



Afghanistan Strategies on Renewal Energy and Policy (Cont.)

Some of the Guiding Principles are:

- Selection of renewable energy options based upon:
 - ✓ Resource availability.
 - ✓ Distance from the national grid,
 - ✓ Community ability to operate and maintain the particular renewable energy supplied.
 - ✓ Equipment cost.
 - ✓ Number of beneficiary households.
- Facilitate private sector participation as rural energy service providers, involving cooperatives, municipality governments, energy service companies or equipment dealers.
- Operate energy systems as sustainable business units, including cost recovery through revenue collection, and for Operations and Maintenance (O&M).
- Involving communities and providing management training to operate and maintain household or community facilities, involving women in management of household systems.

Afghanistan Strategies on Renewal Energy and Policy (Cont.)

The regulatory measures to attract private sector and promote sustainability will include the developing of a **legal framework** ensuring:

- ✓ Pricing and tariff structures to recover capital and Operations and Maintenance (O&M) cost as well as return on the investment.
- ✓ Financial incentives: corporate income tax, customs duties, sales tax , among others.
- ✓ Clear rules for Resolution of Disputes

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4. Overview of Renewable energy Resources

- Solar
- Wind
- Hydro

Overview of Renewable Energy Resources.

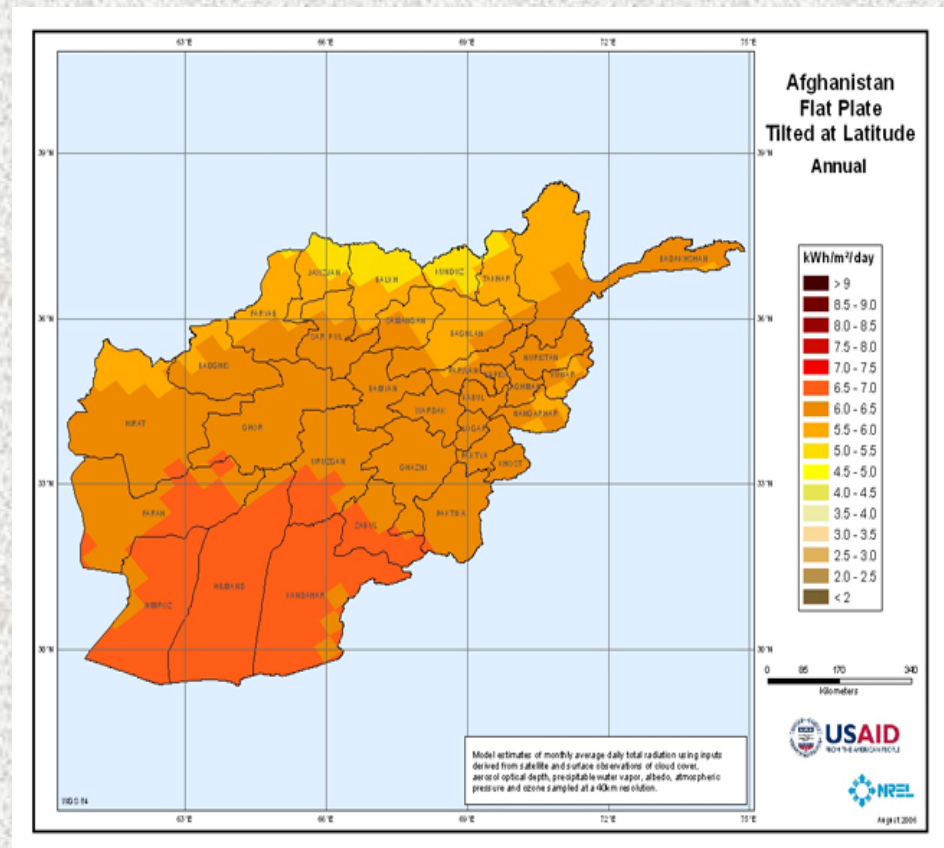
- Afghanistan is gifted with a vast potential for renewable energy, including hydro, solar and wind power.
- The national potential is mainly hydro based.



Overview of Renewable Energy Resources (Cont.)

Solar Power Potential

- Afghanistan has significant solar resources, averaging 300 days of sunshine per year.
- Solar radiation is estimated to average of 6.5 kWh per square meter per day.



Global horizontal solar radiation map

Overview of Renewable Energy Resources (Cont.)

Solar Energy Utilization

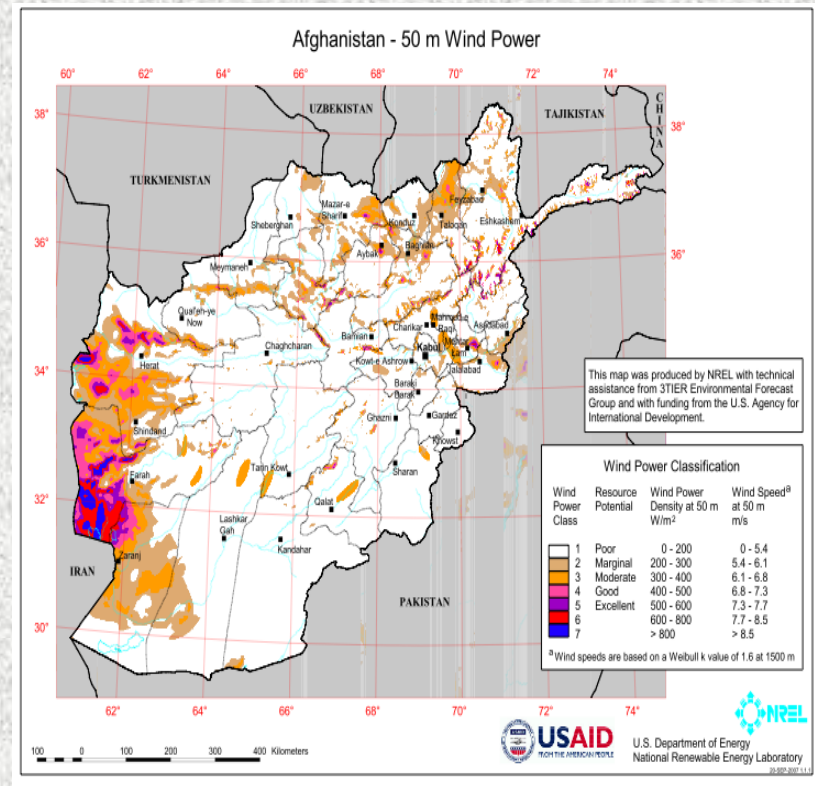
- Small solar photovoltaic plants are being installed in rural areas :
 - ✓ Bamian
 - ✓ Nuristan
 - ✓ Paktia and
 - ✓ Ghazni
- ✓ The installed capacity on Solar are about 12.8 MW and further 1.5 MW is under construction, mainly to benefit schools and clinics.



Overview of Renewable Energy Resources (Cont.)

Wind Power Potential

- Total theoretically installable Capacity sums up to 158,000 MW, with 5 MW per km². (NREL Elliott, 2007)
- It is mainly concentrated in the West of Afghanistan.
- Currently a small wind farm is operating in Pandshir with 10 wind turbines of 10kW each.



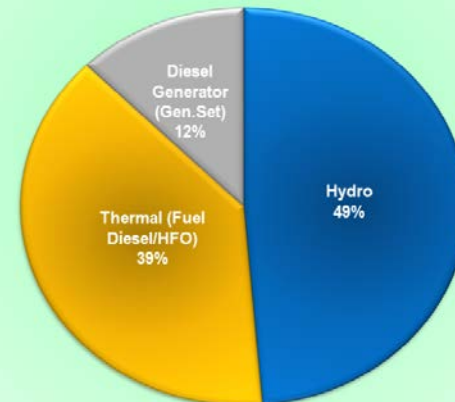
Overview of Renewable Energy Resources (Cont.)

Hydro Power Potential

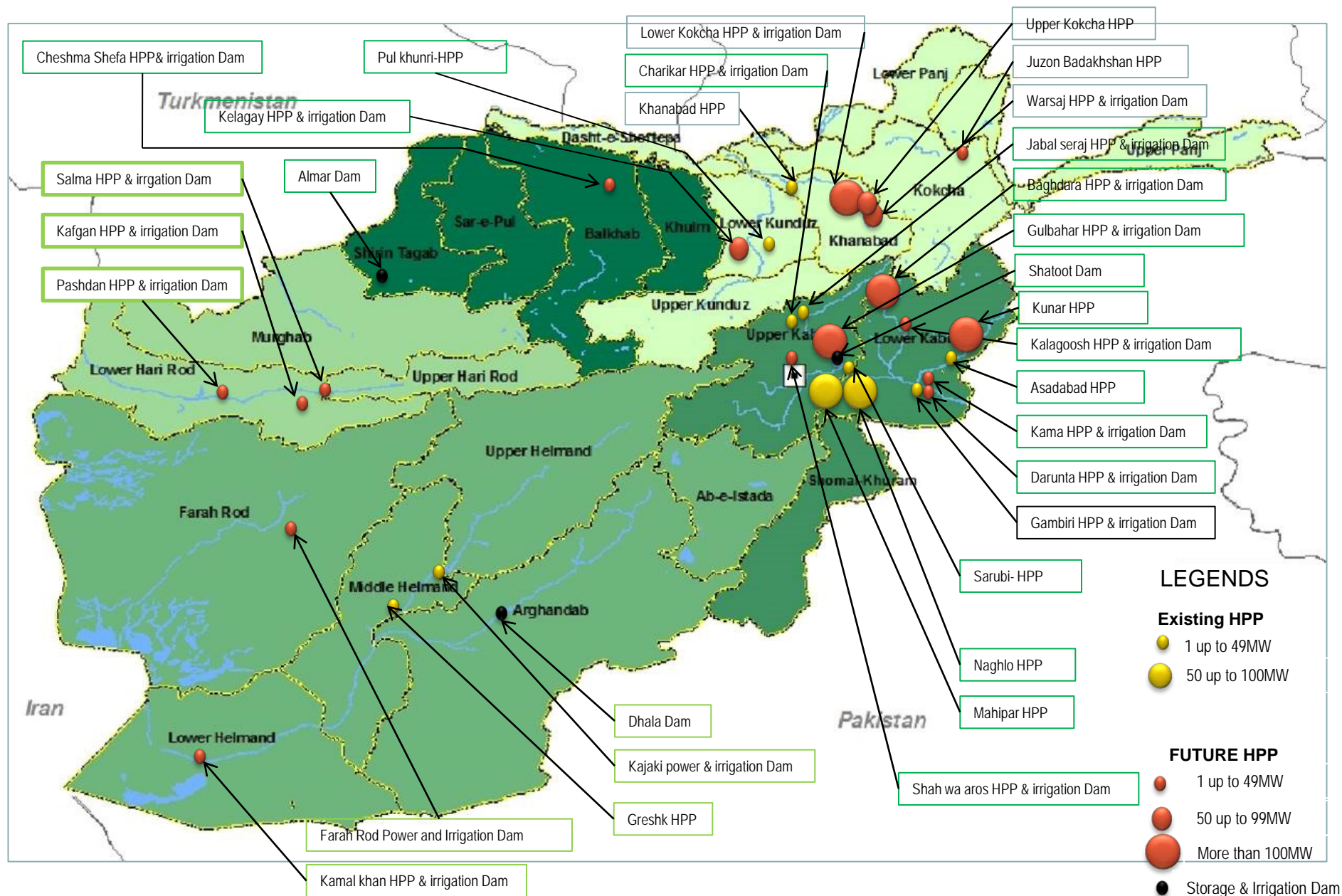
- Hydro power potential for Afghanistan is in excess of 23,000 MW (large, medium and micro hydro power plants).
- Out of this potential 1,580 MW are part of Afghanistan's Master Plan.
- The current hydro power installed capacity is 49%.



Afghanistan Power Plants Installed Capacity in MW



Overview of Renewable Energy Resources (Cont)



Thank You

