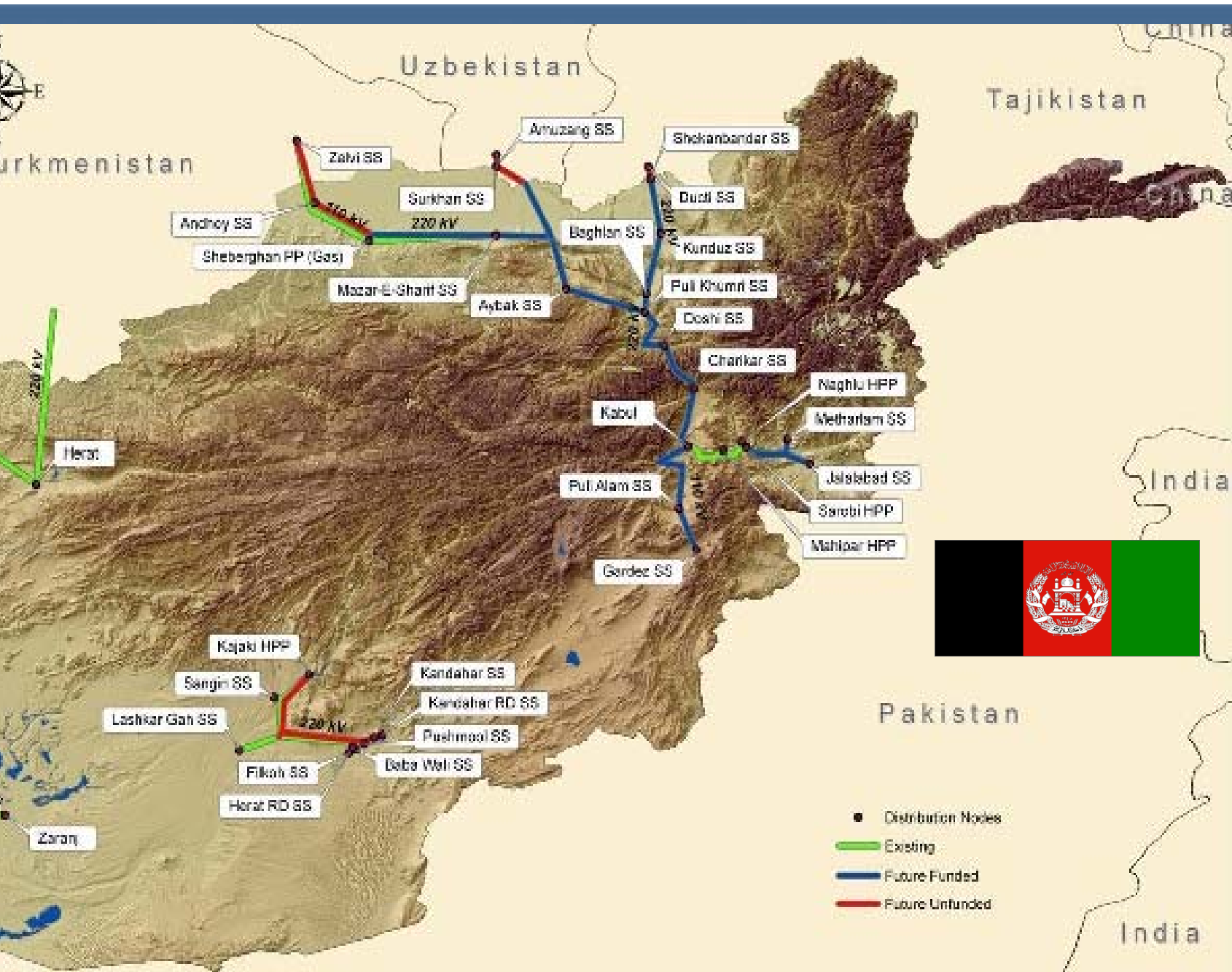


Grid Connected Renewable Energy Workshop

Washington DC

Aug 29 – Sep 6, 2009



General Facts about Afghanistan

Afghanistan is a mountainous country, which is located in Asia. This country doesn't have a way to the sea. Turkmenistan, Uzbekistan and Tajikistan have borders in the north of Afghanistan, Iran is in the west and this country has a small border with China in the northeast.

The area of our country is 650,000 km²

Population:

The central statistical Office has estimated the population in 2003 based on the 1979 census for the Afghanistan was carried out in 1979, showing a population of 23 million including a nomadic population of 1.5 million. The vast majority of the population is living in urban areas.

Religion is **Muslim** ,It has **34** provinces and each province of the Afghanistan has many districts. The capital of Afghanistan is Kabul, which has about 3700000 population : some large provinces are Heart Kandahar and Mazir Sharif. People are talking in different languages **some of the them** (Pashto ,Dari , Uzbek and Turk...) they have different cultures, this country is historical , and it is the door of central Asia so , has suffered many attack of foreigner.

Weather:

The climate is various in the different parts of country , we have our white and snowy winter and **snow summer** , the air is clear with out smoke and machines just the centre of Kabul city is full of traffic it has its own reason.

Structure of the Power Industry in Afghanistan:

The Government of Afghanistan created its own power sector in the year 1968 by taking over Electricity Corporation, which is a joint Sector enterprise. In 1986, the Government enacted Afghanistan's usage of electricity act making the Ministry of Water and Power responsible for the Afghanistan Power Sector in 1980. The act also defines the right of electricity and development of new renewable Energy resources.

The Government also created five autonomous enterprises for management of the power sector under the Enterprise Act in 1980. The five Enterprises are:

Da Afghanistan Breshna Moassesa (DABM) in charge of Generation, Transmission and Distribution of Electricity in Afghanistan.

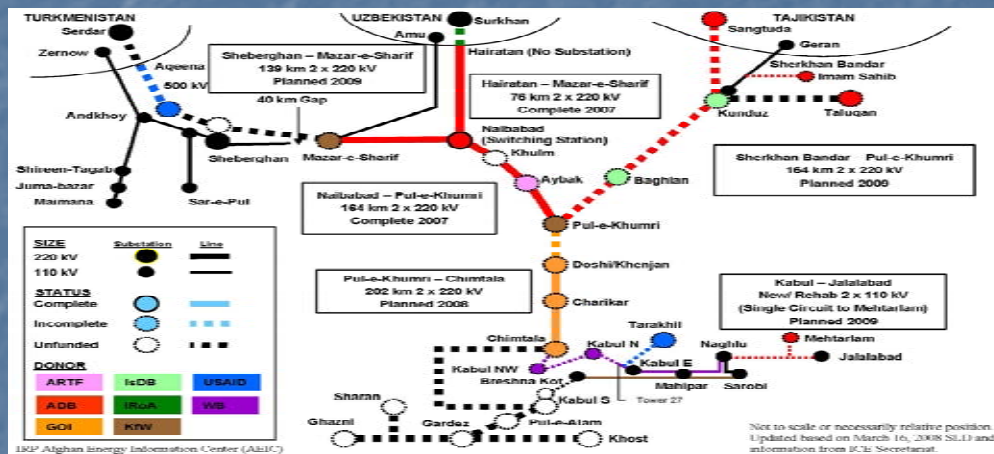
Spinghare Construction Unit in charge of Civil works for Power Stations and substations and all civil works relating to the power sector.

Power Construction Unit in charge of erection of all Electrical works like erection of transmission and distribution lines and substations.

Water and Power Engineering Consultancy Authority (WAPECA) responsible for design including field survey of new generation, Transmission and distribution projects.

New and Renewable Energy Research and Development Centre responsible for activities relating to development of Renewable Energy.

By the end 2010, electricity will reach at least 65% of households and of non-residential establishments in major urban areas and at least 25% of households in rural areas; at least 75% of the cost will be recovered to the national power grid. A strategy for the development of the use of renewal energies will be developed.



Towards Achieving the targets

To facilitate the achievement of the targets, the following activities must be undertaken:

ADB and the Government of India have financed the construction of transmission lines from the Uzbekistan border towards Kabul. Construction has done, and includes the sub-station along this line.

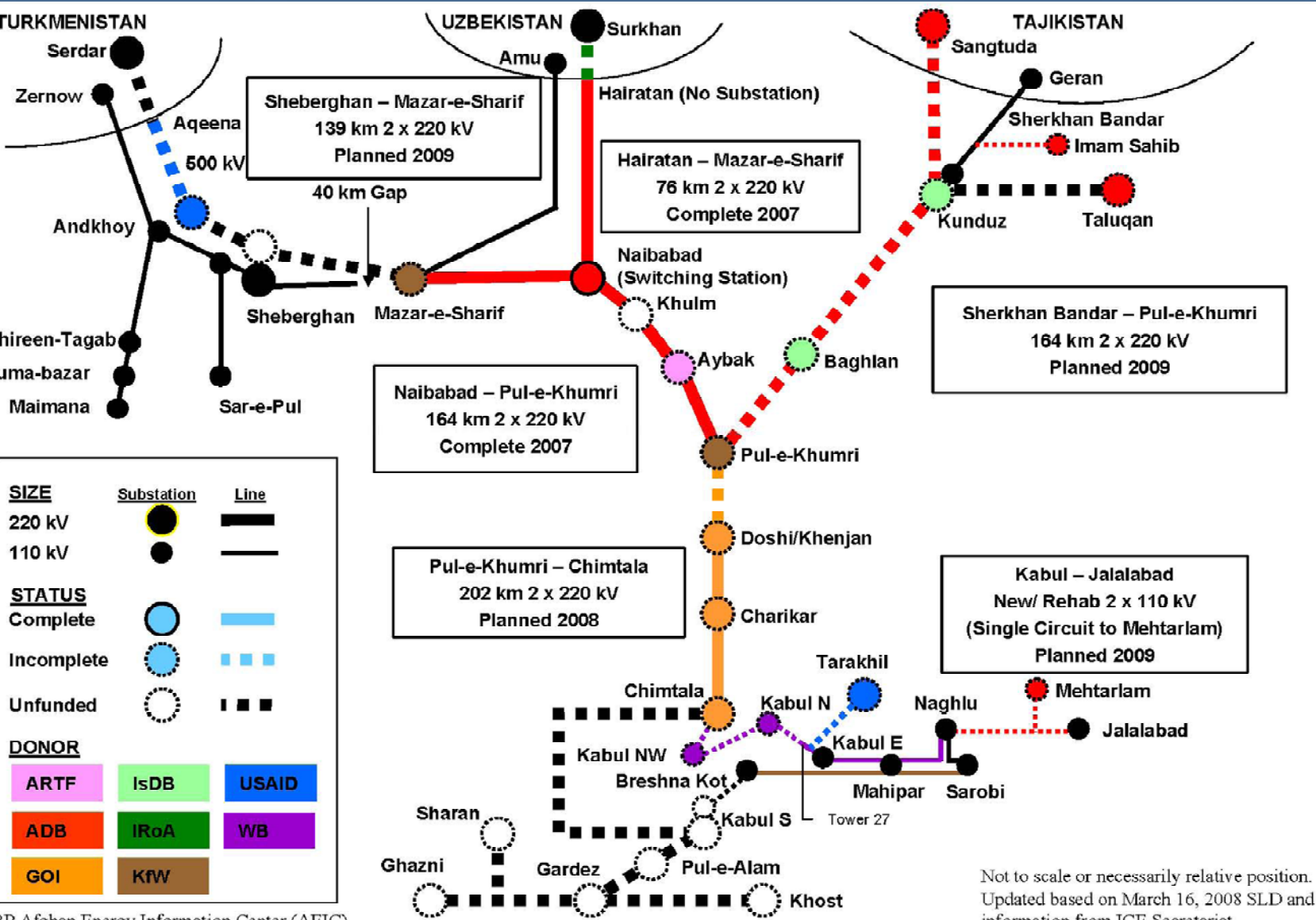
Consulting work for the Da Breshna Mossesa (DABM) restructuring (WB) is consulting,

A feasibility study for the Baghdara hydropower development must be undertaken.

ARTF funding has been identified.

Multiple construction and rehabilitation projects

NESP Status



Not to scale or necessarily relative position. Updated based on March 16, 2008 SLD and information from ICE Secretariat.

Other planned projects (e.g rehabilitation of Naghlou hydropower plant, the rehabilitation of the Kabul City Network, the Sheberghan power plant, and rehabilitation of the Naghlu -Kabul transmission line have been proceed.

Critical Challenges to Achieving the Targets

Significant investment are required if the benchmark target is to be achieved.

An estimated 10% Of households in major urban centers have access to electricity.

An estimated 5% of households in rural areas have access to electricity.

Only55% of costs is received form current users connected to national power grid.

Lake of donor support as demonstrated by the withdrawal of funds (USAID, WB), yet an estimated USD 450 million of investment is required in the sector over the next 10 years.

Donor financing must be made available to build the required grid infrastructure throughout the country.

About 15% of population has access to electricity, and the annual energy consumption by each household is 37.5kWhr, although this figure is not comparable with global standard(1700kWhr). But today's urgent need for electricity generation is 1000 MW. Gradually this figure will increase according to prosperity of cities and rural areas up to 5000MW. **The total generation of power plants is 655MW and the total energy from foreign countries is 250MW.** As a first step regional cooperation is necessary to solve energy problem in our country.

Reach natural resources in Afghanistan especially hydro potential sites and clean energy resources need enough budget and long time, also MEW would not be able to provide these opportunities for construction of power plants with large capacities and useful utilization of clean energy, Therefore the import of energy from near neighbors with respect to study the time and cost of electricity is the first priority. People have used electricity for illumination of houses by extend of transmission lines from Tajikistan, Uzbekistan, Turkmenistan and Iran to the North and west provinces of Afghanistan. The work plan of 220 kV transmission line has started from Uzbekistan since 2002 and it completed in 2009.

On the other hand Afghanistan with best geographical and strategic location of inter-link road of trade between central Asia and those countries which are located in the sought and East Asia.

New & Renewable Energy Research & Development Center (NRERDC)

New and Renewable Energy Enterprise established on 1st June in 1985 as a research department under the supervision of MEW. In 1988 this department developed as a no benefiting enterprise, in the beginning of progress UNDP was the first organization that had technical cooperation with NRERDC. This enterprise has started its productive activities since 2002 as a benefiting enterprise. The New and Renewable Energy Enterprise was cancelled in 2008 to Renewable Energy Department. The New and Renewable Energy Dep. under the coalition of MEW has concerned on study of useful utilization of clean energy like, microhydros (Run – of – River type), hybrid system, hot water system, Solar Panel and pumps, Wind Energy System biomass, bio gas and



Micro hydro (Run – of – river type)

Survey of 62 micro hydro sites have done by international experts and qualified Afghan engineers.

Solar energy

Fortunately we have more than 325 sunny days in our country with an irradiation of (600W/m²).

Installation and utilization of solar hot water system projects by technical experts in schools, orphanages, kindergartens, hospitals, clinics military schools, households and other public sectors was the main goals.

ADB Technical Cooperation

Training courses

Establish of useful training courses by Newzeland specialist, the training subjects was in the field of micro hydro, hybrid systems; raising and lowering of 31m wind monitoring towers, and collection of data from monitoring tower's symphony.



Hybrid projects

Hybrid pilot projects established by the cooperation of ADB technical assistance and NREDC qualified engineers.

3kW solar diesel system which powered NREDC building in 2004.

Installation of 2kW solar wind diesel system in Panjshir province (Rokha District) in 2002

Solar pump projects

Installation and utilization of solar pumps to the north and west provinces of Afghanistan for drinking water and water treatment projects in 2003-2006.



Wind monitoring towers projects

Installation and study of wind data from monitoring tower's symphony (Loggar Province) in 2003.



Micro hydro projects

Survey and feasibility study of micro hydro sites in Panjshir, and Bamyan provinces by Nipples and Afghan renewable energy experts, But the civil work of these projects is not completed yet.



GTZ Technical cooperation
Technical training course
programs for technicians and
barefoot engineers. Particularly
employing and training of 60
Afghan women.



Distribution of solar stand
alone system (Solar lantern)
with cheap price for remote
and rural area villagers.



Production and repair of Scheffler reflector type with best quality and high efficiency for cooking of crops, meet, and vegetables.

Analysis and collection of wind data from wind monitoring towers for polite projects and feature plans



Energy Program Goals

Reduce pressure on Afghanistan's already stressed environment

Provide sustainable energy resources in rural areas

- Develop sustainable energy utilization methods
- Utilize energy efficient building systems
- Promote solar designs
- Improve non-electric household energy supplies (cooking & heating needs)

Improve economic development (livelihood)