

# In the Name of Allah

# Islamic Republic of Afghanistan Ministry of Energy and Water Status of the Power Sector in Afghanistan

*Past, Present, and Future*

# Power Sector Status After 2002

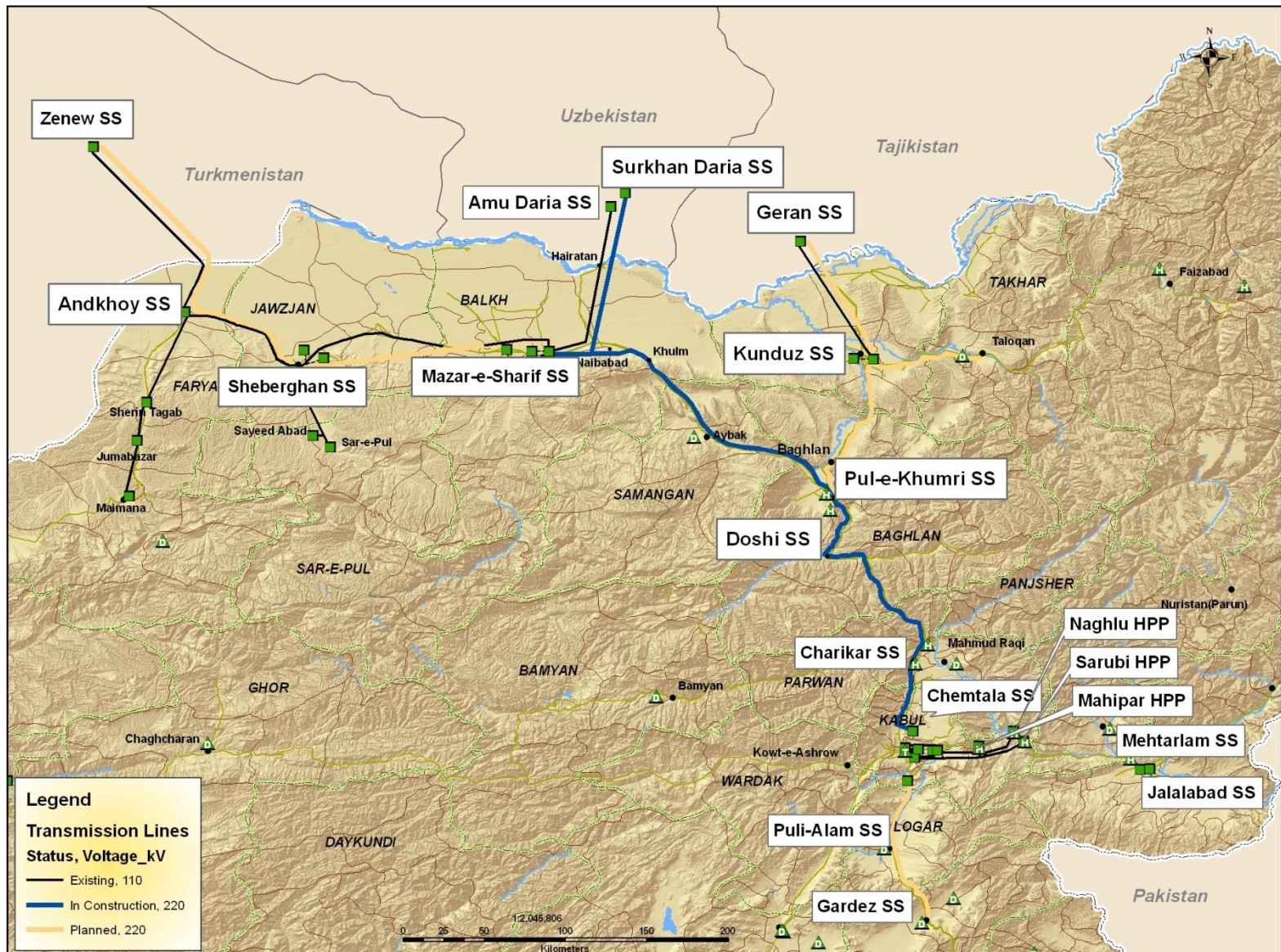
- ▶ Power generation and import has been increased from 291 MW to 1644.76 MW.
- ▶ Installed capacity to import power from neighboring countries has been raised from 50 MW to 840 MW.
- ▶ Total 110 KV, 220 KV transmission lines length have been raised from 745 Km to 2200 Km.
- ▶ Total number of consumers has been increased from 117,000 to about 1200000.

# Transmission lines

- From Uzbekistan 300 MW in 220 KV T/L for Kabul City and other provinces.
- From Turkmenistan:
  - 25 MW from 110 KV T/L to Andkhoy, Jawzjan, Saripul, and Maymana
  - 25 MW from 110 KV T/L to Herat and Rubat Sangi
- From Tajikistan 25 MW from 110 KV T/L to Kunduz.
  - 300MW in 220kV T/L
- From Islamic Republic of Iran:
  - 120 MW through 132 KV double circuit TL to Herat and Ghorian substations
  - 10 MW through 20 KV single circuit to Herat
  - 20 MW through 20 KV double circuit to NimRoz



# Existing Transmission Import Lines



# Sources of Electrical Power in Afghanistan

Afghanistan main sources of Power are as follows :

- ▶ Hydro
- ▶ Natural gas
- ▶ Petroleum
- ▶ Coal
- ▶ Renewable Energy

# Energy Resources Potential

- ▶ Hydro power potential: 23,000 MW (large, medium, small dams and micro hydro power plant )
- ▶ Natural gas: 60 billion cm<sup>3</sup> approx.
- ▶ Petroleum : 12 million tons
- ▶ Coal reserves : 100 million tons (in different locations throughout the country (establishing the precise quantities and qualities require further studies)
- ▶ Solar and wind potential: (Mapping to be completed and least cost options to be pursued )
- ▶ Most of these foresaid reserves have not been exploited yet.



# Improvement of the Present Status of Power

## Short Term Actions

- ▶ Rehabilitation of the existing Hydro and Thermal Power Plants
- ▶ Upgrading of Distributing Networks in order to reduce technical and commercial losses
- ▶ Importing power from neighboring countries
- ▶ Developing Renewable Energy resources



# Improvement of the Present Status of power

## Short Term Actions

- ▶ Completion of NEPS high voltage transmission lines .
- ▶ Development of domestic sources of energy
- ▶ Installation of a gas-fired thermal power plant of 400 MW in Sheberghan.

# Improvement of the Present Status of Power.

## Medium Term Actions

- **HPP Detail Design Initiated and ongoing:**
  - Baghdara Hydro Power Plant
  - Kukcha & Kunar
  - Kilaghai
  - Kama River (starting)
  - Fara Roud
  - Gul Bahar
  
- **HPP Detail Design to be initiated:**
  - Surobi 2
  - Kajakai 2
  - Olambagh
  - Amu & Panj River
  - Kala Gosh
  - Kuner

# Regional Project

- ▶ 1-CASA 1000

# Project Location



- The HVAC T/L route commences at **the** Datka substation in Kyrgyz and terminates at Khoudjand substation in Tajikistan
- HVDC converter stations are located at Sangtuda –1 (1300 MW), Kabul (300 MW) and Peshawar (**1300** MW)
- Length of the T/L route (in km):
  - Kyrgyz – Tajikistan interconnection – 450
  - Tajikistan – 117
  - Afghanistan – 562
  - Pakistan – 71

# Project Description

- ▶ A 450 km 500 kv HVAC transmission line between Kyrgyz Republic (430 km) and Tajikistan (20 km)
- 750 km 500 Kv HVDC transmission line between Tajikistan (117 km) through Afghanistan (562 km) to Pakistan (71 km)
  - HVDC converter stations at Sangtuda –1 (1300 MW), Kabul (300 MW) and Peshawar (1300 MW)



# 2-TUTAP

## Central Asian Countries

Tajikistan

Uzbekistan

Turkmenistan

## South Asian Countries

Afghanistan

Pakistan

# Afghanistan Transmission and Generation Expansion Plan – Possible Interconnection with Pakistan by Reinforcing SEPS' 220 kV

ADB: AFG-TMK Regional Interconnection Project

ADB: AFG-TMK 500kV Interconnection

ADB: Additional Hindu Kosh Crossing (Salang Pass)  
Resolve currently transmission capacity constraints

USAID, USFOR-A and ADB: SEPS – South East Power System double circuit only one to be strung

Kajaki HPP 100MW

CASA-1000 DC 500kV

Interconnection with Pakistan reinforcing SEPS stringing the second circuit.

## Legend

Exist 220kV  
Future AC 500kV  
CASA- 000MWDC 500kV  
Future AC 220kV  
SEPS's 220kV Reinforcement to Pakistan



# Long Term Planning

- HPP Construction:
  - Baghdara (with the Capacity of 220 MW)
  - Surobi 2 (with the Capacity 1 80 MW)
  - Kajakai 2 (with the Capacity 1 00 MW)
  - Kokcha (Qala Mamai with the Capacity 420 MW)
  - Kuner ( Shall and Sagi with the Capacity 1 098 MW)
- Thermal Plant – Construction of coal thermal Power Plants With the Capacity 1 200 MW

**Thanks for Your Kind Attention**