

Afghanistan

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AFG Overview

Master Plan

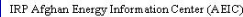
Regional Initiatives

Afghanistan: Overview

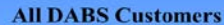


- Area: 600,000 km²
- Pop: 30 million
- GNI/Capita: \$680
- Mineral rich
- Energy sources:
 - Coal /Gas
 - Hydro
 - Solar/Wind
- Strategic location

NEPS Status



- **\$950m to date**



2013 >30%

AFG Power Sector Master Plan www.adb.org/projects/43497-012/documents

Today

- 2032

-

Staged Developments

2011	GWh	Remarks
Hydro	801	250MW capacity. >> <i>Seasonal</i> .
Thermal	39	220 MW capacity. Diesel. >> <i>Expensive</i>
Imports	2,246	Uzbekistan(57%), Iran (22%), Turkmenistan(16%), Tajikistan (4%). >> <i>Growing</i>
Total	3,086	<i>All growth over last decade met by imports</i>

2032

- New thermal (Shebergah gas and Aynak coal) and hydro plants (Kunar + various).
- Imports drop to 33% of total.
- Major increase in imports from TKM
- Continued imports from TAJ & UZB
- Electrification 86%

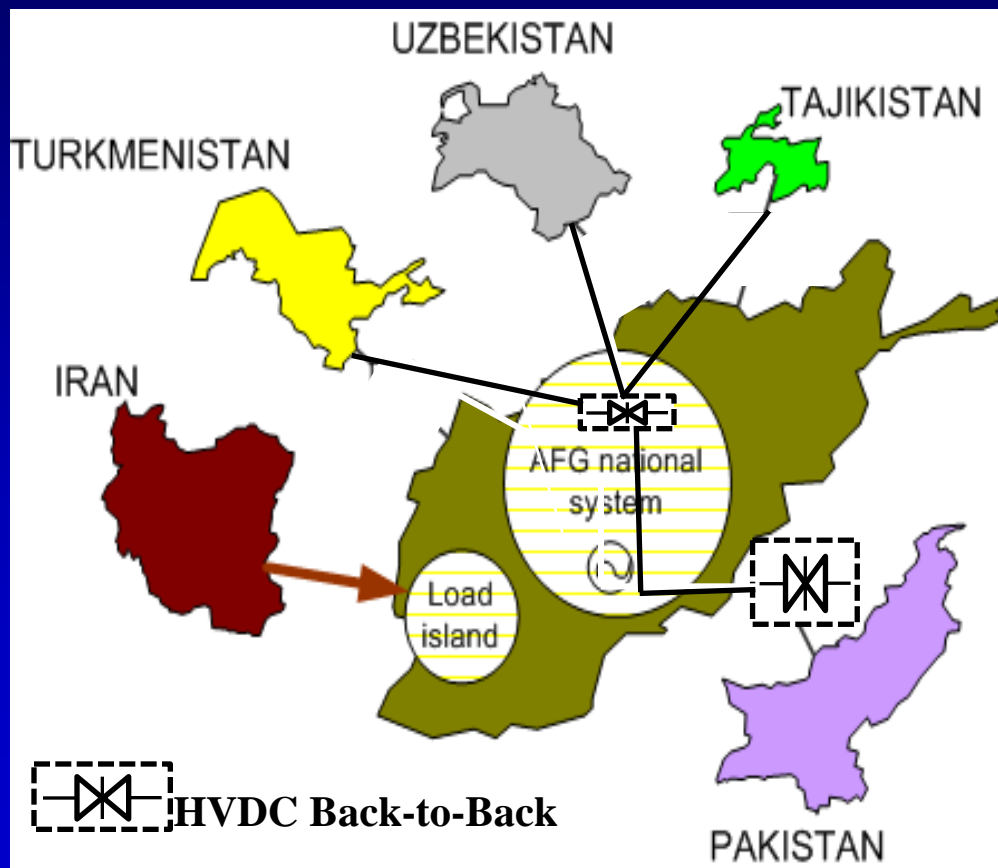
Mid term (2020++):

Increase imports as domestic plants developed. Priority projects :

- Increase interconnection with TKM
- Develop gas, coal, & hydro plants
- strengthen grid and increase electrification

Asynchronous Interconnection

- UZB, TAJ and TKM systems are not operated in synchronism.
- Asynchronous interconnection via HVDC Back to Back at Pul-e-Khumri (PUK).



Benefits of HVDC back to back

- Modular technology- built in stages to meet needs
- Facilitates integration of remote diverse resources
- Controllable -power injected where needed
- Proven technology
- Facilitates power wheeling to Pakistan

Central Asia-South Asia Regional Electricity Market (CASAREM)

Energy Rich Central Asia

TKM

TAJ

UZB

KGZ



Power Poor South Asia

AFG

PAK

Benefits

- ✓ Least cost option for meeting south Asia power needs
- ✓ Diversification and expansion of central Asia energy exports
- ✓ Trade driven economic growth

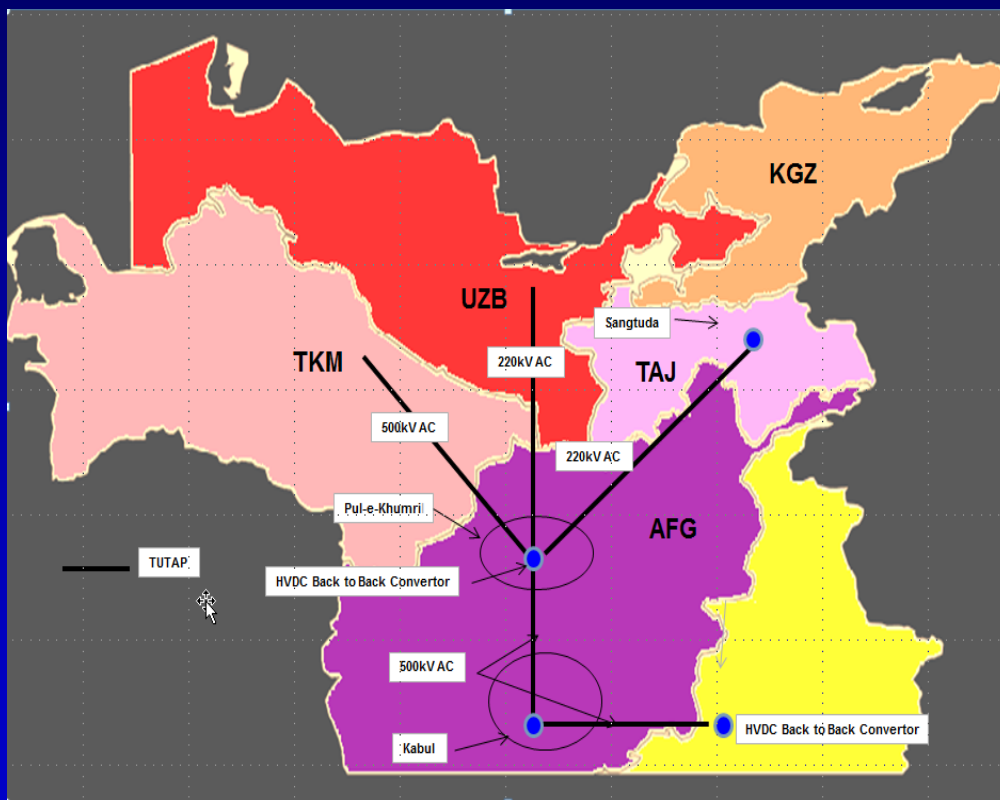
CASAREM Initiatives:

TUTAP: Central Asia exports to AFG grid and onwards to PAK

CASA-1000: TAJ and KGZ hydro surplus exported to PAK

CASAREM Project: TUTAP

Rationale: Connect Central Asian countries to planned Afghanistan grid who in turn can re-export to Pakistan



- TUTAP uses existing and planned assets in Afghanistan to connect Central Asia to Pakistan
- TUTAP is an acronym of countries to be directly connected to Afghanistan grid, being Turkmenistan, Uzbekistan, Tajikistan, Afghanistan and Pakistan

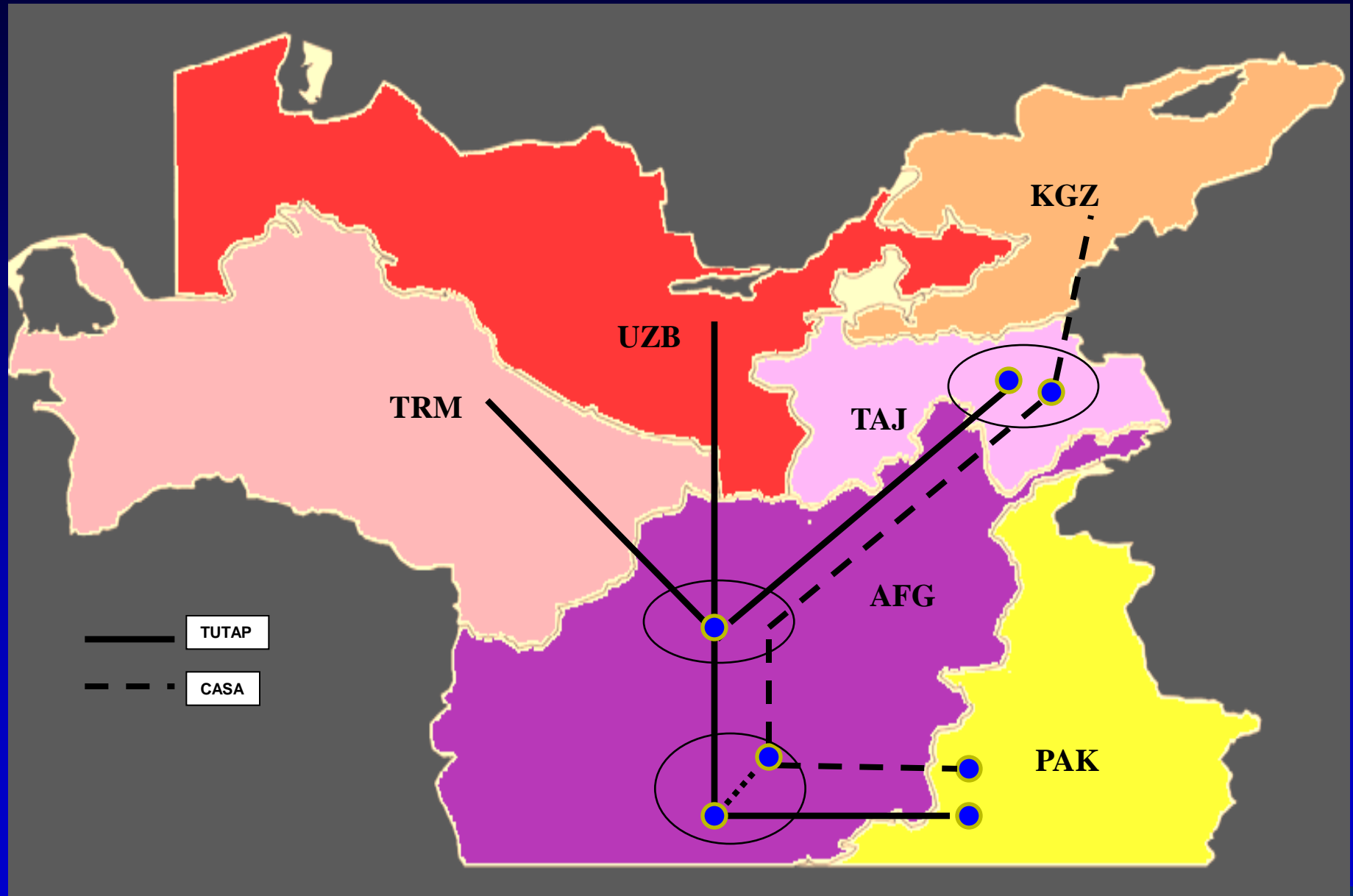
CASAREM Project: CASA 1000

Rationale: Export summer surplus power from KGZ and TAJ to AFG and PAK

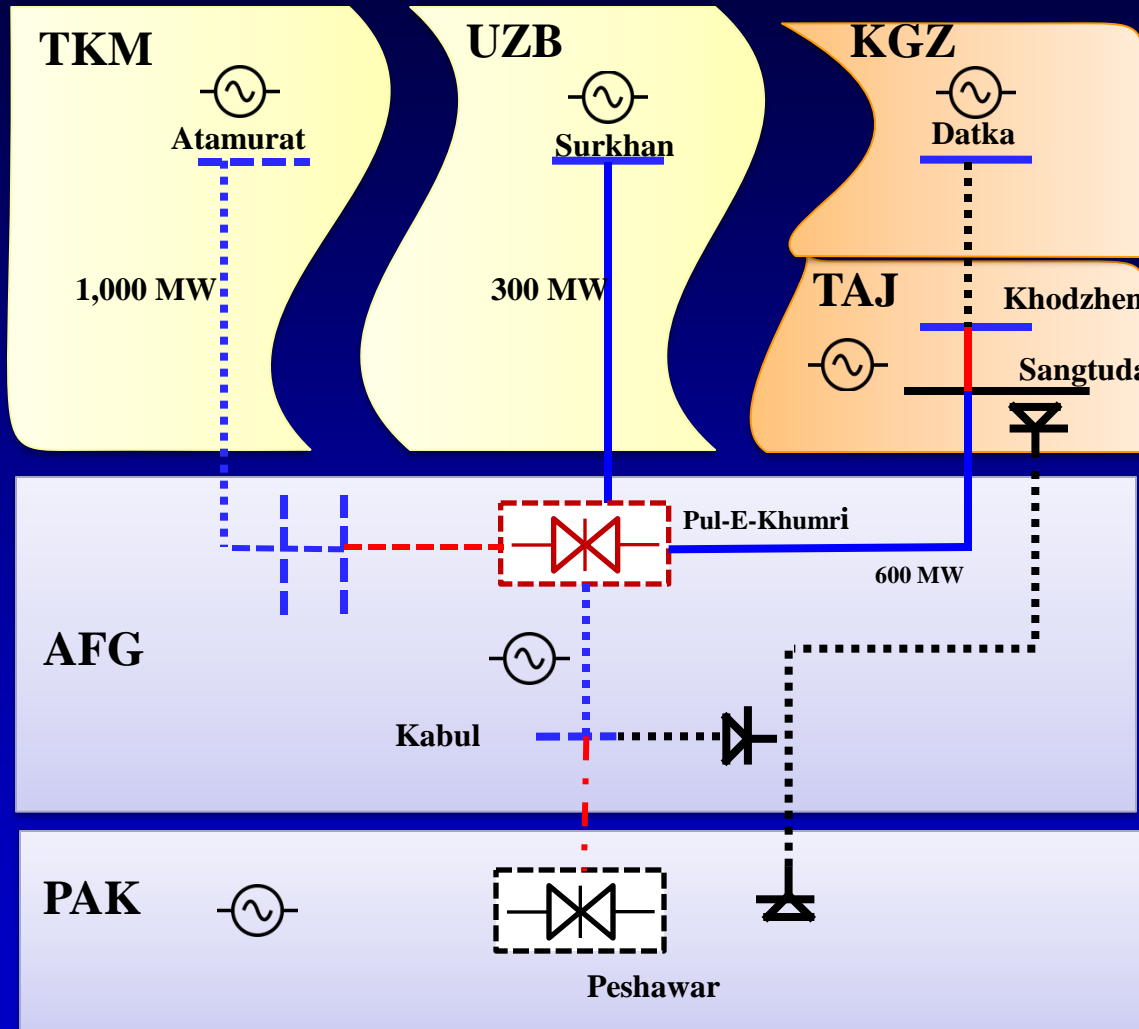
CASA = Central Asia South Asia



TUTAP and CASA 1000 Schematic



Summary Technical Features



Legend

	Existing 220 kV
	Existing 500 kV
	Under implementation 500kV
	Proposed 500kV
	Proposed HVDC Back-to-Back
	CASA AC/DC Convertor
	CASA Line

Thank You