

Developing the Central Asia - South Asia Energy Corridor

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COUNTRY STRATEGY

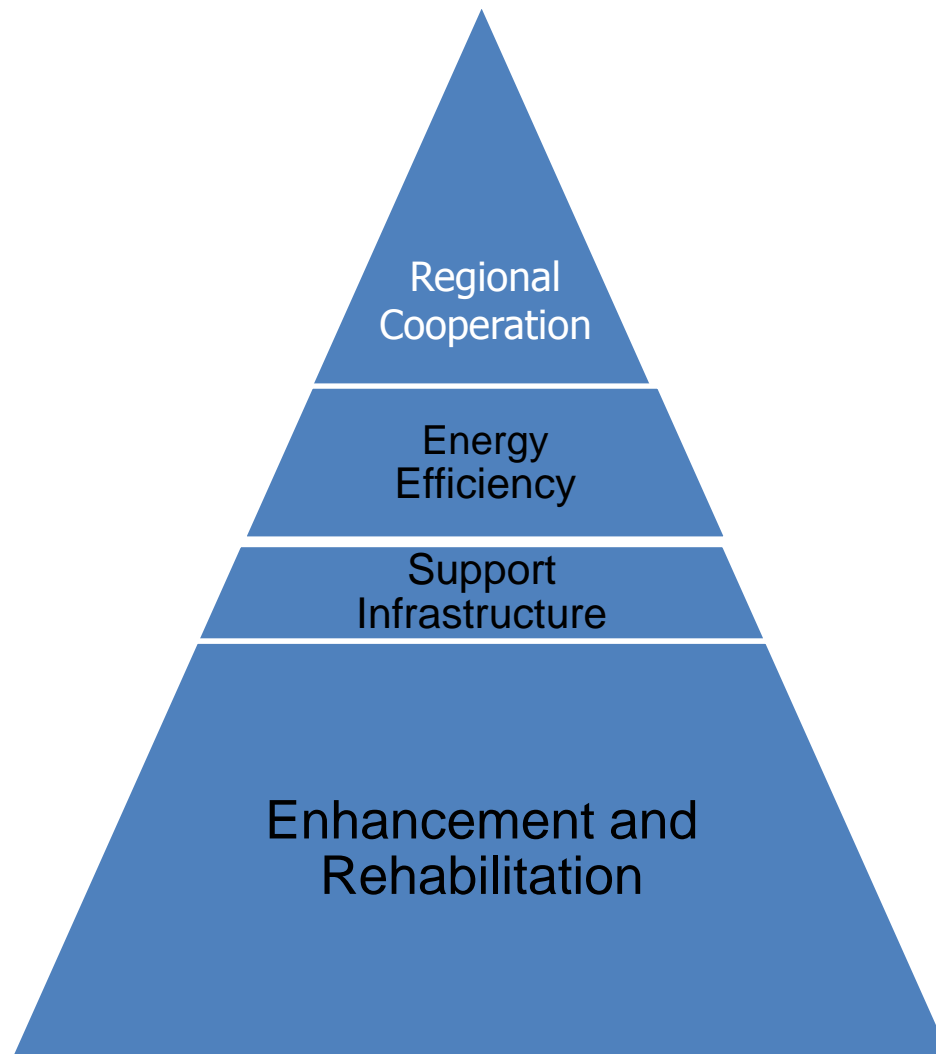


Figure 1: Cross-Border Transmission Project



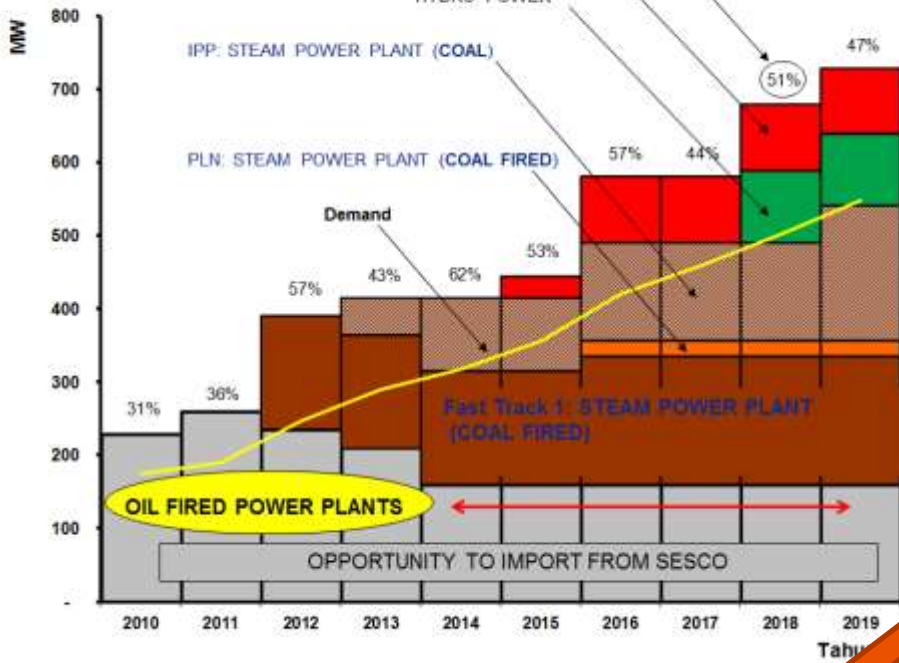
Sovereign Loans: ADB (\$50 million),
AFD (\$50 million) to Government of Indonesia

Non-Sovereign Corporate Loan:
ADB (\$45 million) to SESCO



Without Interconnection

Supply-Demand
West Kalimantan, Indonesia



OIL FIRED POWER PLANTS

3 c/kWh

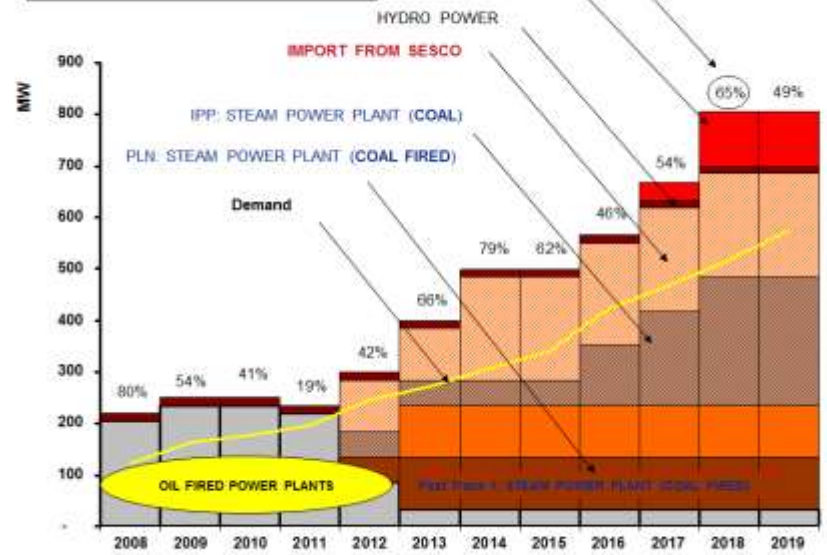


30+ c/kWh

10 c/kWh

With Interconnection

Supply-Demand
West Kalimantan, Indonesia



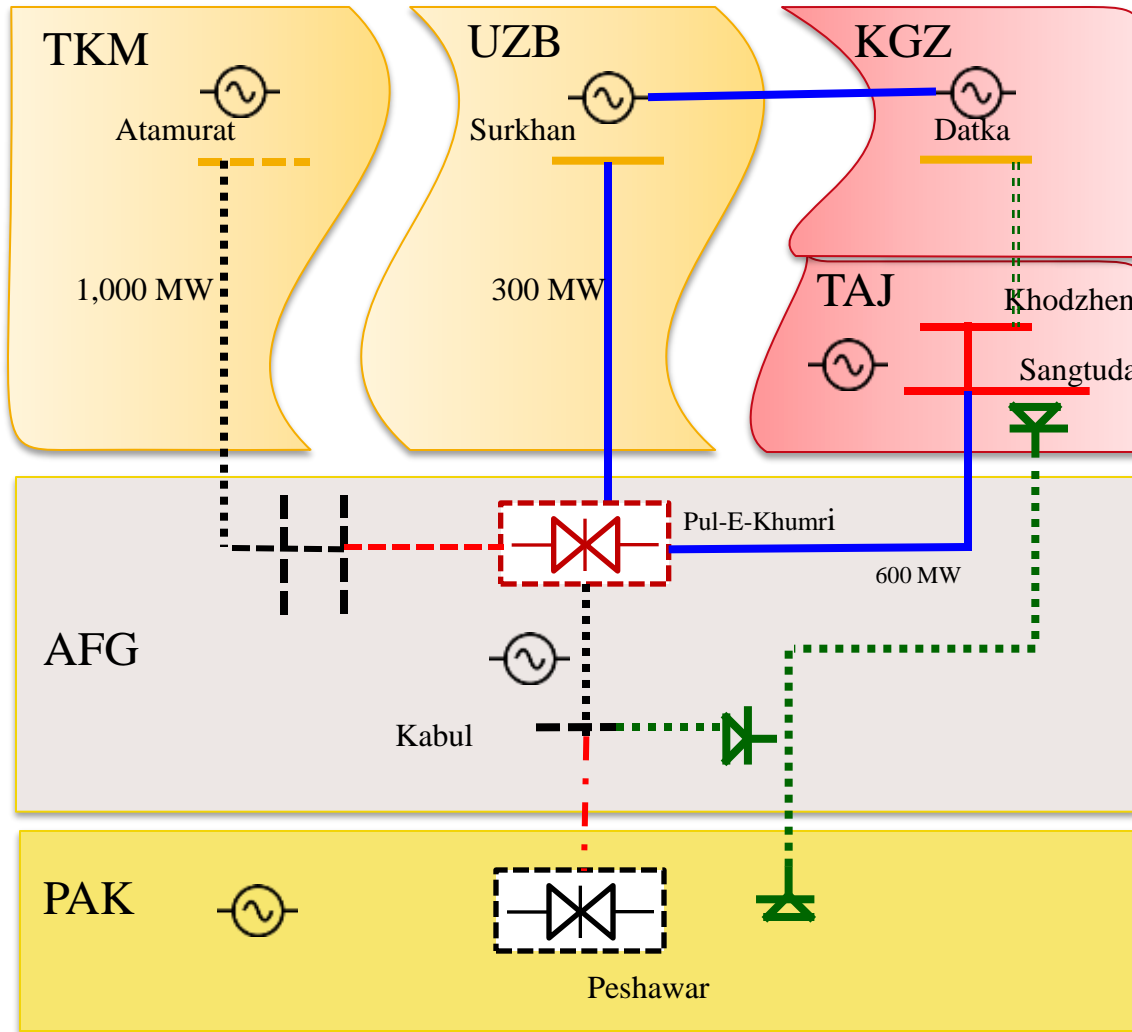
OIL FIRED POWER PLANTS



Trade Potential

- **Export**
 - Year round Thermal Power - Uzbekistan, Turkmenistan, Kazakhstan
- **Summer hydropower - Kyrgz Republic and Tajikistan**
- **Import**
 - Year around shortage Pakistan, Afghanistan
 - Winter shortage Kyrgz Republic and Tajikistan

CASREM (CASA-1000 and TUTAP)



Legend

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

TUTAP: benefits

Uzbekistan–Afghanistan (completed 2009)

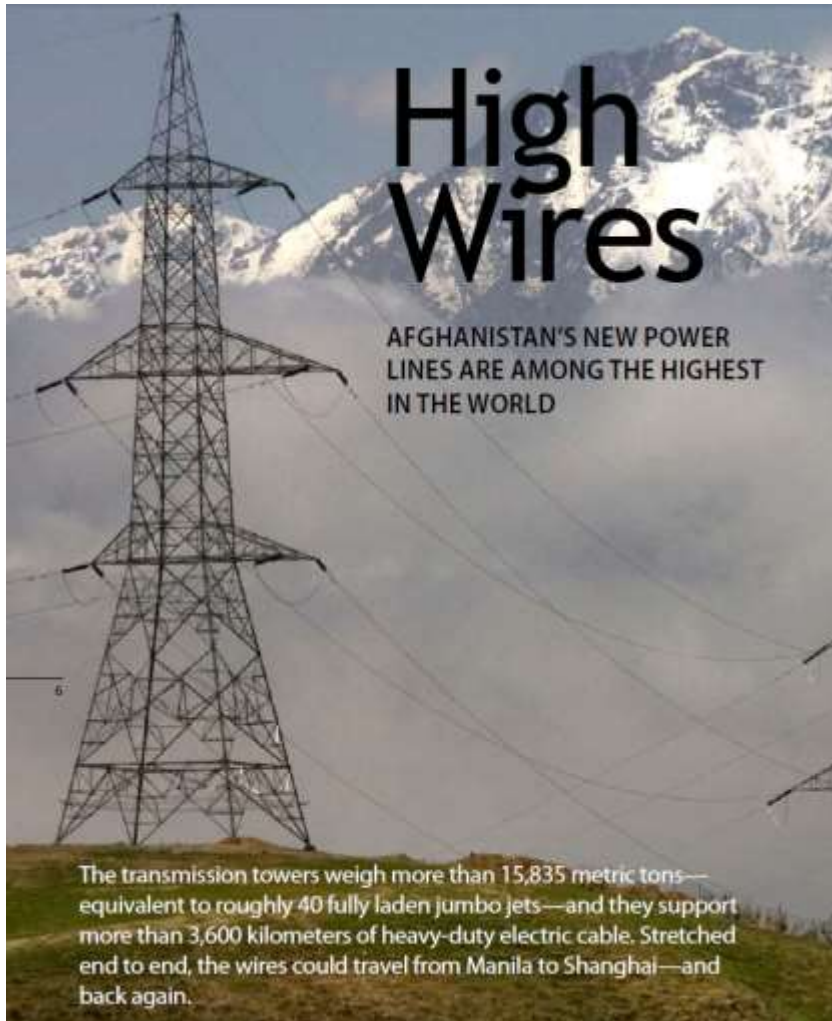
300 MW, 220 kV, 500 km

Cost around **\$100m**

Estimated Savings: vs self diesel
generation per year - 2014

1500 GWh

\$323 million





TUTAP: benefits

Tajikistan to Afghanistan
(Oct 2011)

600 MW, 220kV, 175 km (in AFG)

Cost around: **\$57.43 million**

(\$20.93 million for Tajikistan and
\$36.5 million for Afghanistan)

- Estimated Savings against vs self diesel generation per year - 2014
- 650 GWh
- **\$170 million**



TUTAP: benefits phase 2 and 3



Phase 2

Turkmenistan – Afghanistan

(to Andhoy, Shebergan, Mazar)

(Shebergan to Pul-i-Khumri)

300MW, 500kv, 108km

Cost **\$160 million**

Savings vs self diesel generation per year

by 2019 **900 GWh**

• **\$225million**

500MW, 500kv, Converter station at to connect to Kabul grid

Cost **\$450 million**

Savings vs self diesel generation per year- 2025 **1600 GWh**

• **\$400 million**

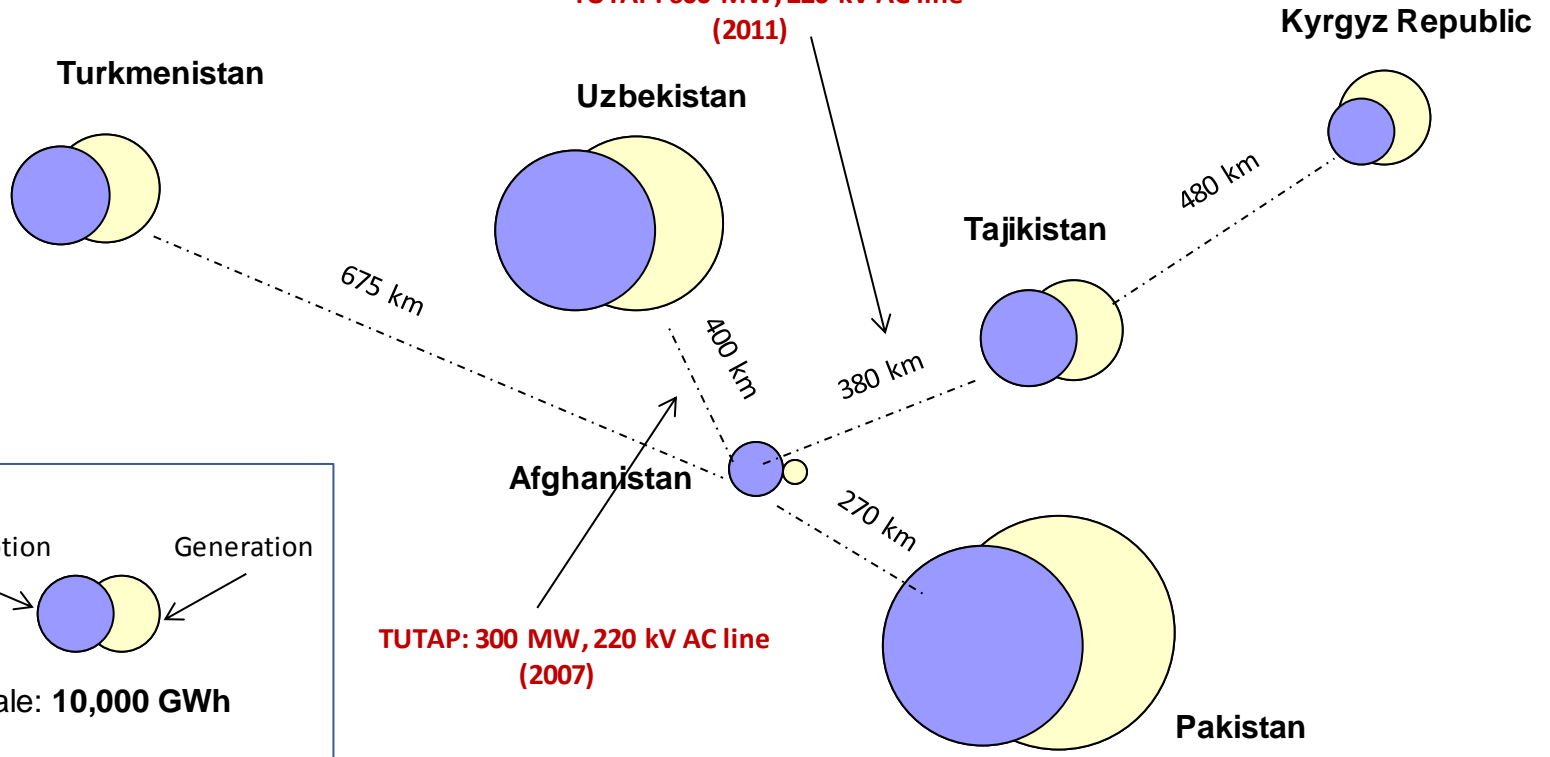
Phase 3

- **Afghanistan to Pakistan or Tajikistan (2025)**

Regional Power Cooperation Projects

Investments, Demand, Supply and Transmission

**TUTAP: 600 MW, 220 kV AC line
(2011)**



2015

Regional Power Cooperation Projects

Investments, Demand, Supply and Transmission

TUTAP: 600 MW, 220 kV AC line
(2011)

Kyrgyz Republic

Turkmenistan

Uzbekistan

Tajikistan

480 km

675 km

400 km

380 km

TUTAP: 1000 MW, 500kV AC line
(2017-2018)

Afghanistan

270 km

TUTAP: 300 MW, 220 kV AC line
(2007)

Pakistan

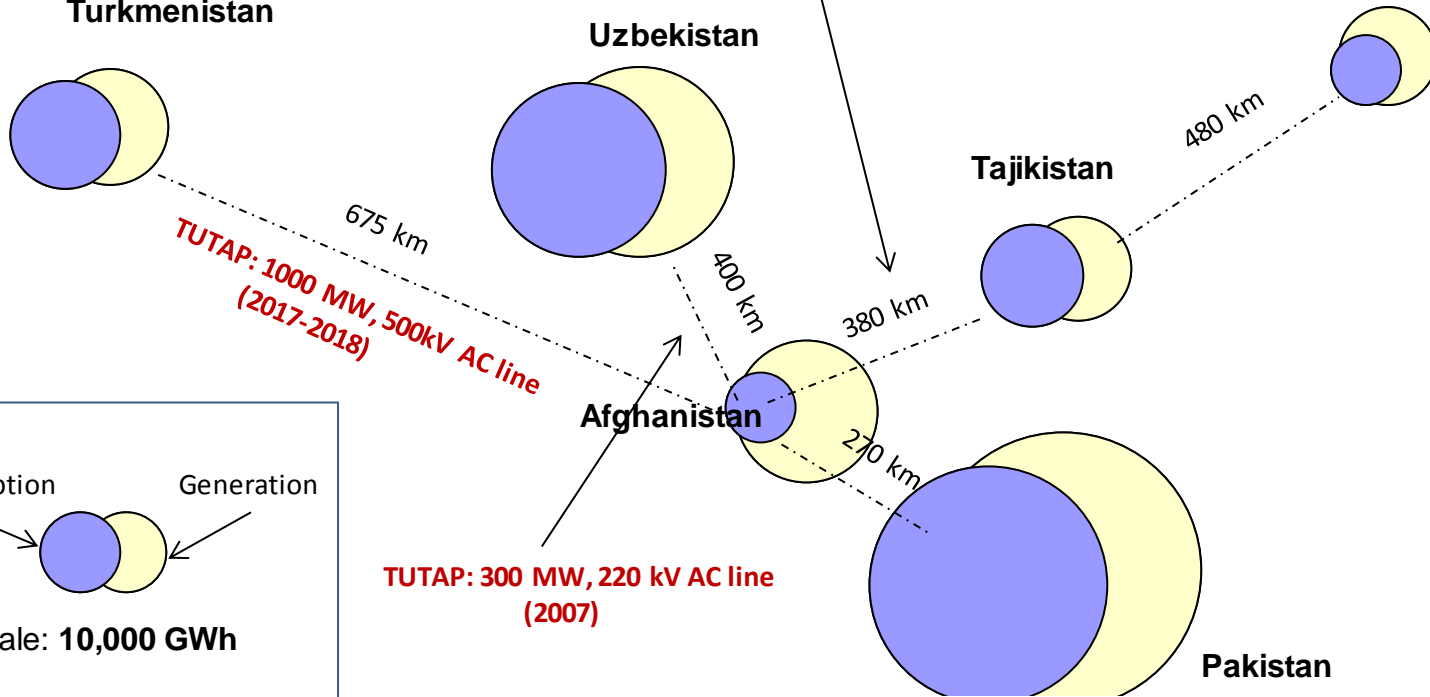
Consumption

Generation

Scale: 10,000 GWh

2018

ADB



Regional Power Cooperation Projects

Investments, Demand, Supply and Transmission

TUTAP: 600 MW, 220 kV AC line
(2011)

Kyrgyz Republic

CASA-1000: 1,300MW AC/DC Station
at Sangtuda

Turkmenistan

Uzbekistan

Tajikistan

480 km

TUTAP: 1000 MW, 500kV AC line
(2017-2018)

675 km

400 km

380 km

CASA-1000: 500kV AC line
(95% in KGZ)

CASA-1000: 750km HVDC line
TAJ-AFG-PAK

Afghanistan

270 km

TUTAP: 300 MW, 220 kV AC line
(2007)

Pakistan

CASA-1000: 300MW AC/DC Station at Kabul

CASA-1000: 1300MW AC/DC Station at Peshawar)

2020

Consumption

Generation

Scale: 10,000 GWh

Addendum to the Afghanistan Power Sector Master Plan

TA 8475 AFG

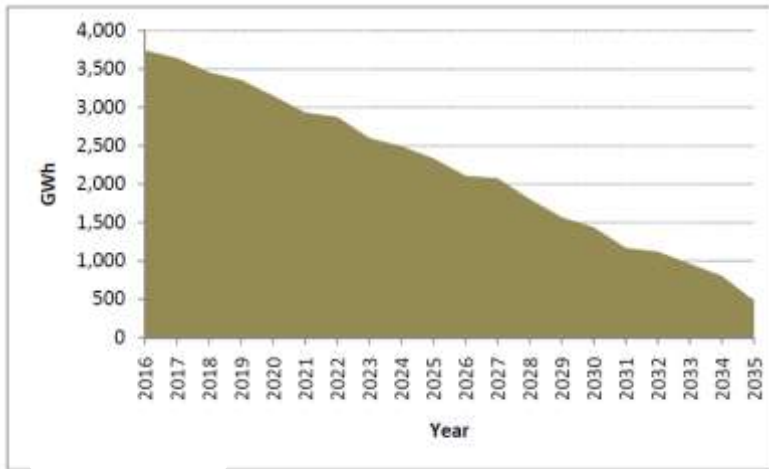


Report prepared by:

FICHTNER



Diminishing Surplus Power in Exporting Countries



Tajikistan Average Yearly Surplus (GWh)

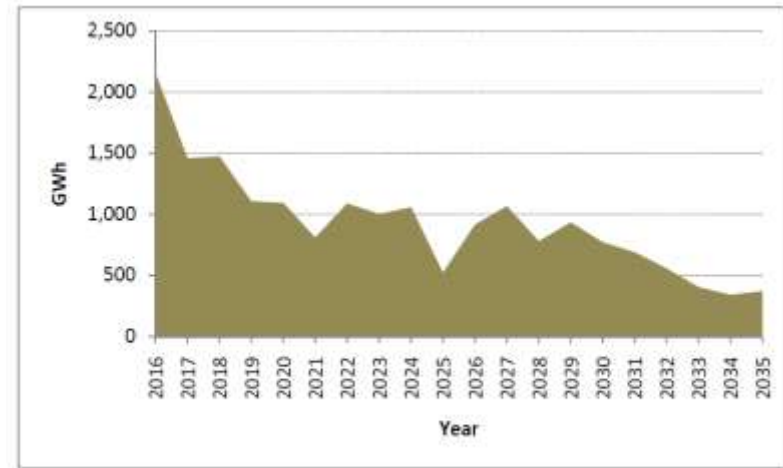
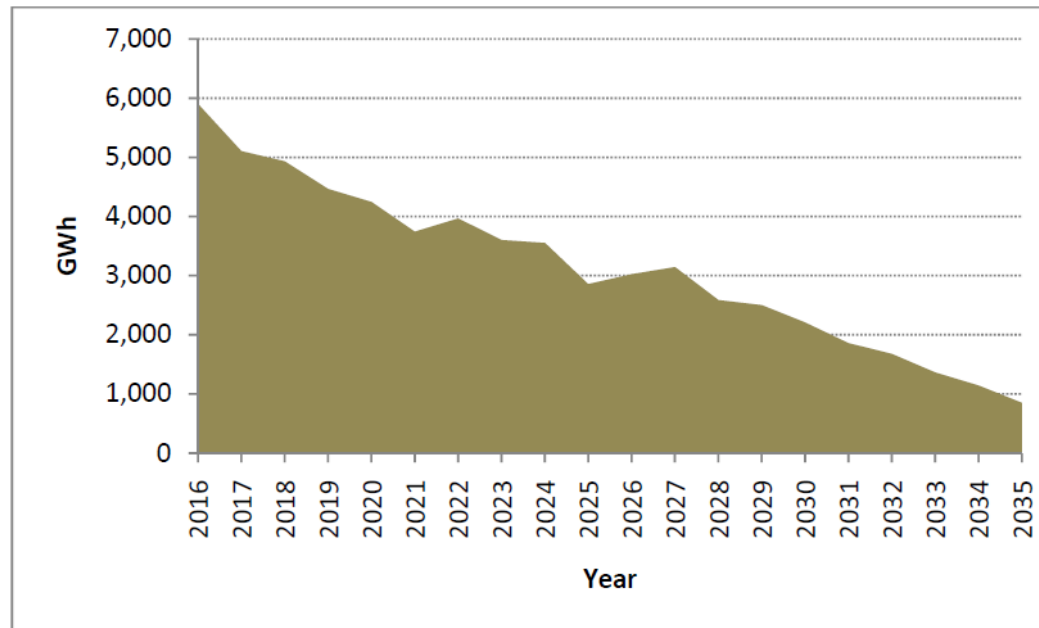


Figure 2-3 Kyrgyz Republic Average Yearly Surplus (GWh)

Risks and Uncertainties

CASA-1000 and TUTAP



Combined Average Yearly Surplus (GWh)

Source:

SNC • LAVALIN

Final Feasibility Update Report



Addendum to the APSMP

CASA-1000 and TUTAP

Financial Cost Benefits:

- These projects complement each other. Both projects are capable of delivering 1,000 MW to Pakistan.
- CASA-1000 provides is an open access regime for exporting surplus energy. Afghanistan can earn transmission wheeling revenue by exporting 300 MW through its lines
- TUTAP enables domestic hydropower surplus, and an export route for Turkmenistan, Uzbekistan, Tajikistan and the Kyrgyzstan.
- **CASA's dedicated transit route are lower than the risks of TUTAP's transit through a national network.**

Project	FIRR
CASA-1000	11.6%
TUTAP300	9.6%
TUTAP1000	13.2%
CASA+TUTAP300	10.1%
CASA+TUTAP1000	12.9%

