Energy Trade & Regional Connectivity

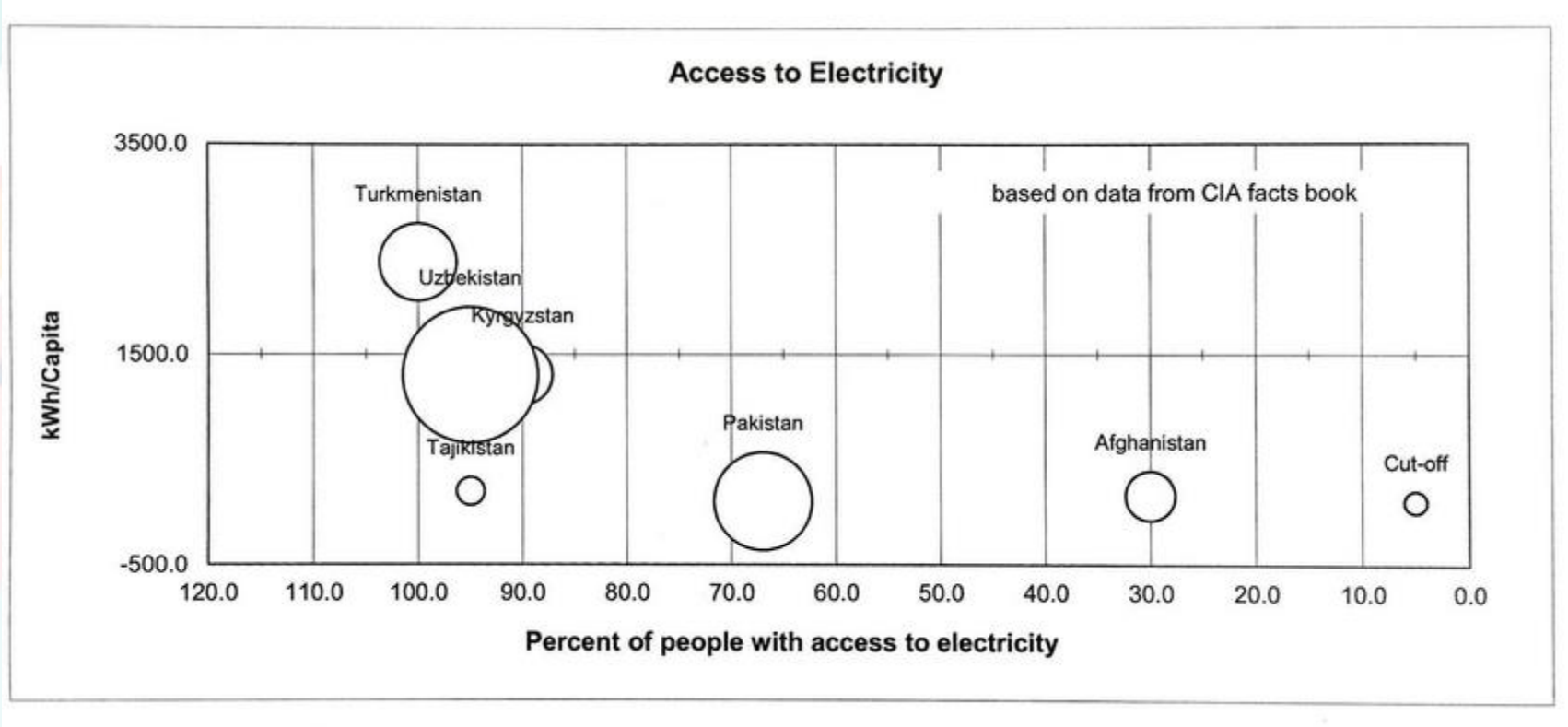
Central Asia South Asia Regional Energy Markets (CASAREM)

ESCC
CAREC ENERGY SECTOR COORDINATING COMMITTEE

27th CAREC ESCC MEETING

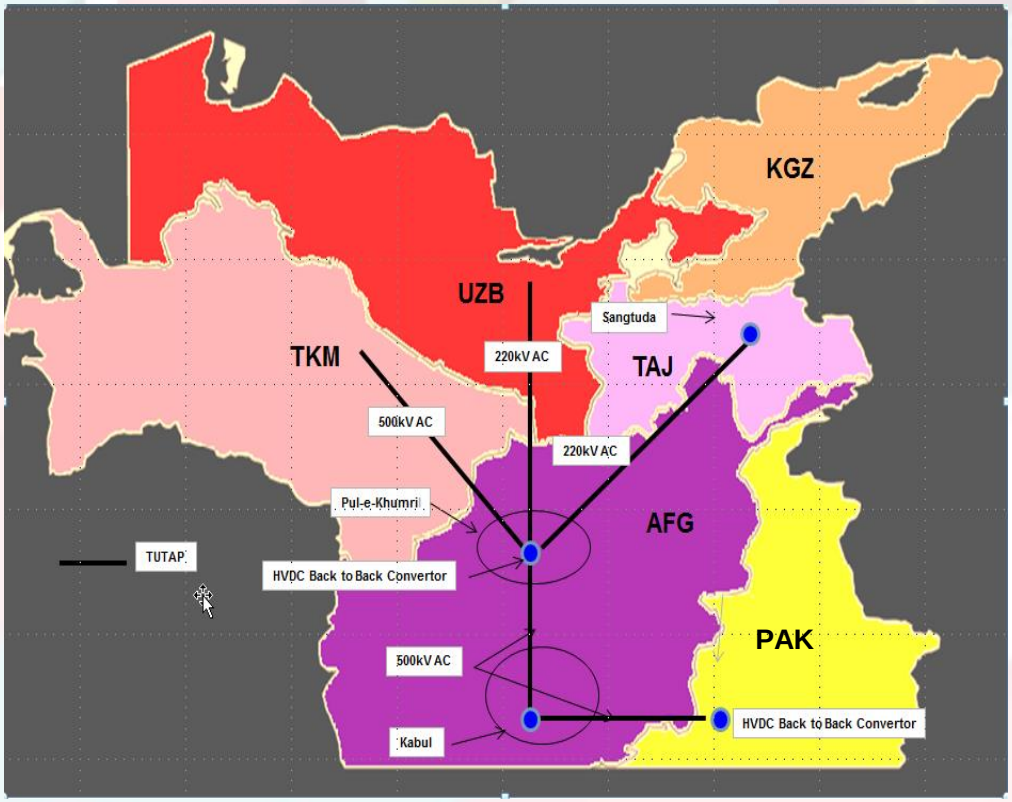
13-14 March 2018, Yyldyz Hotel Ashgabat, Turkmenistan

Electricity Access in Central and South Asia



TUTAP: Import/Export Solution

Connect Central Asian countries to planned Afghanistan grid who can re-export to Pakistan



Acronym of Turkmenistan (TKM), Uzbekistan (UZB), TAJ, AFG, PAK (being AFG and its contiguous countries)

Concept for thermal and hydro power rich Central Asia countries to supply AFG grid with surplus power to be exported to PAK

<u>Focused on AFG needs with regional benefits</u>

CASAREM

- (TUTAP): Turkmenistan Uzbekistan Turkmenistan Afghanistan Pakistan Power Interconnection Project
  - AFG as energy trading hub connecting Neighbors
- **Phase 1 – Operational**

1. UZB - AFG Interconnection (220-kV; 500 kms)

- Total Cost $95 million
- Commissioned in March 2009
- 300 MW / 1500 GWh
- PPA negotiated & renewed annually

2. TAJ - AFG Interconnection (220-kV; 160 kms in AFG)

- Total Cost $57 million
- Commissioned in October 2011
- 450 MW / 1380 GWh (Summer only)
- PPA negotiated and renewed annually

CASAREM

- **Phase 2 – Under Implementation**

1. **TKM - AFG Interconnection (500-kV, 350 kms in AFG)**
   - » Total Cost $220 million
   - » To be Commissioned in end 2019
   - » 300 MW / 1560 GWh
   - » PPA negotiated & signed through till 2028

- **Phase 3 – Under Procurement**

1. **HVDC Back to Back Convertor Station in AFG to synchronize TKM imports**
   - » Approved in Dec 2016
   - » 500 MW VSC Technology
   - » To be commissioned in end 2021

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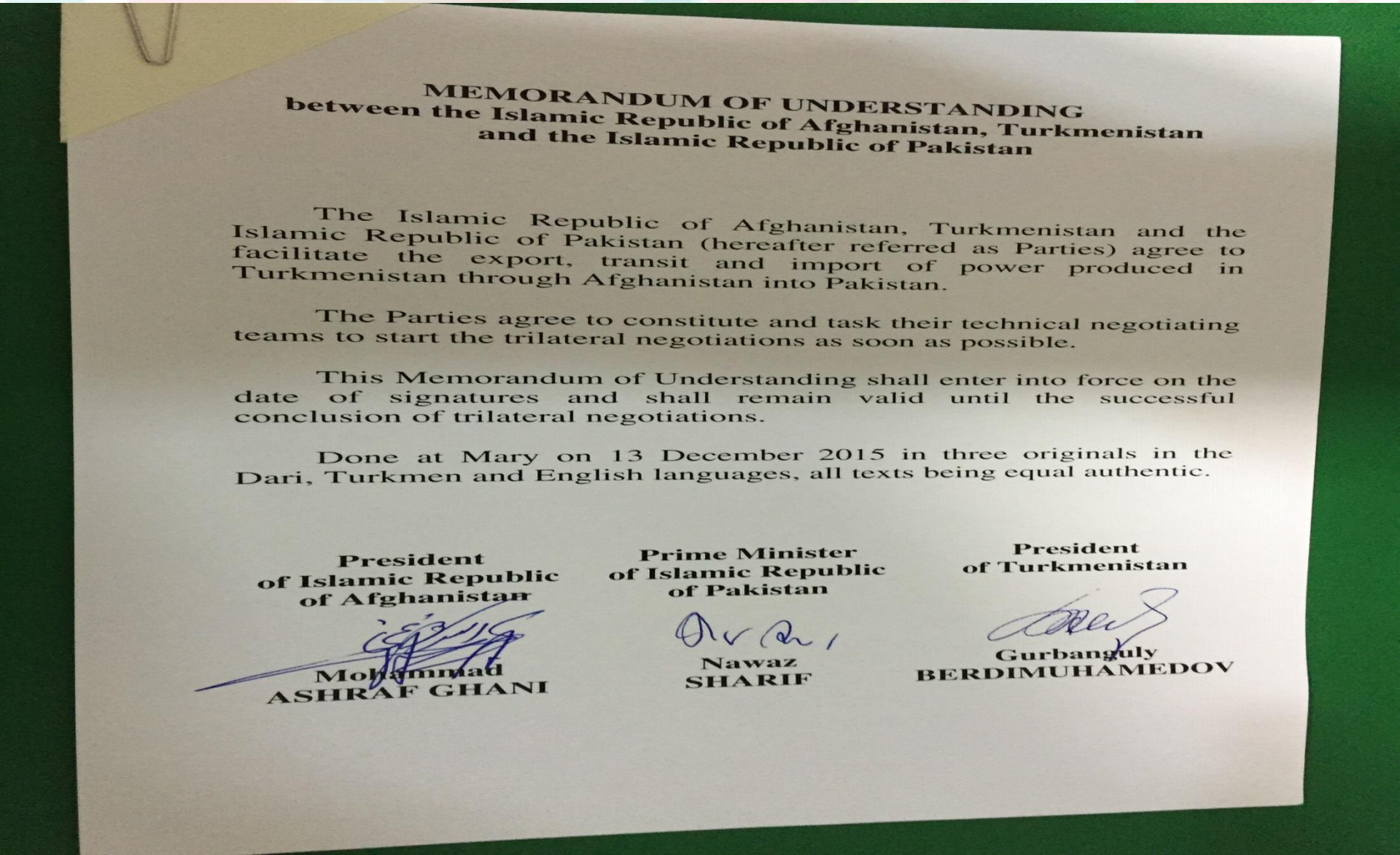
- **Phase 4 – TKM – AFG – PAK (TAP) Planned**

1. **TKM – AFG – PAK Interconnection (500-kV, 750 kms in AFG**

» Cost estimates, route, and feasibility under study
» To be commissioned in end 2021
» PPA to be negotiated
» AFG component to be approved in 2018

Signed by Heads of 3 Governments in Dec 2015



MEMORANDUM OF UNDERSTANDING
between the Islamic Republic of Afghanistan, Turkmenistan and the Islamic Republic of Pakistan

The Islamic Republic of Afghanistan, Turkmenistan and the Islamic Republic of Pakistan (hereafter referred as Parties) agree to facilitate the export, transit and import of power produced in Turkmenistan through Afghanistan into Pakistan.

The Parties agree to constitute and task their technical negotiating teams to start the trilateral negotiations as soon as possible.

This Memorandum of Understanding shall enter into force on the date of signatures and shall remain valid until the successful conclusion of trilateral negotiations.

Done at Mary on 13 December 2015 in three originals in the Dari, Turkmen and English languages, all texts being equal authentic.

President of Islamic Republic of Afghanistan
Mohammad ASHRAF GHANI

Prime Minister of Islamic Republic of Pakistan
Nawaz SHARIF

President of Turkmenistan
Gurbanguly BERDIMUHAMEDOV

TAP Inter Government Agreement (Feb 2018)

INTER GOVERNMENT AGREEMENT

The Government of the Islamic Republic of Afghanistan, the Government of Turkmenistan and the Government of the Islamic Republic of Pakistan (hereinafter referred to as "The Parties"),

WHEREAS the Parties entered into the Memorandum of Understanding on 13th December 2015 to realize the project for the construction and operation of the Turkmenistan-Afghanistan-Pakistan electricity transmission line and associated infrastructure facilities for the purpose of exporting electricity from Turkmenistan into the Islamic Republic of Afghanistan and the Islamic Republic of Pakistan,

NOW, THEREFORE, the Parties enter into this Agreement as follows:

Article 1

In order to meet the country's energy requirements, the Government of the Islamic Republic of Afghanistan and the Government of Pakistan intend to receive electric power from Turkmenistan.

Article 2

Each Party shall provide within its state territory all necessary favorable conditions for the implementation of the project and for the construction and operation of the Turkmenistan-Afghanistan-Pakistan electricity transmission line for the purpose of exporting electricity from Turkmenistan to the Islamic Republic of Afghanistan and the Islamic Republic of Pakistan (hereinafter referred to as the "Project").

TAP Inter Government Agreement (Feb 2018)

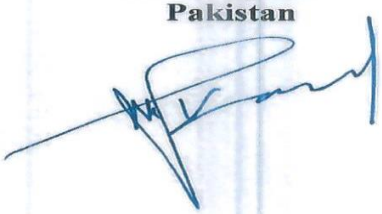
Article 7

This Agreement shall be concluded for the duration of 3 years. Its validity shall be automatically extended for the next 3 years, unless one of the Parties notifies the other Parties of its intention to terminate it, in writing, through diplomatic channels, not later than six months prior to the expiration hereof.

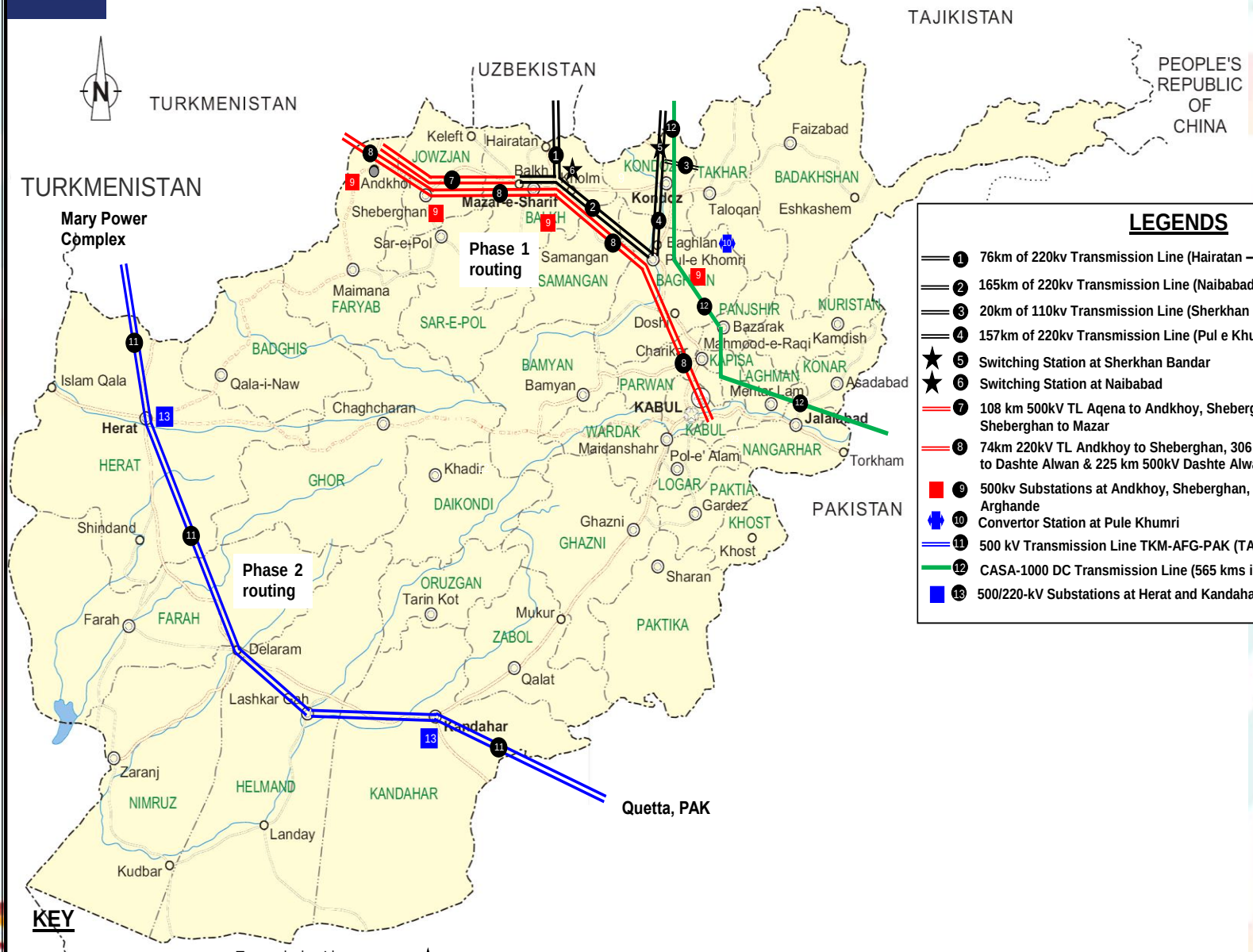
Each one of the Parties shall be entitled to withdraw from this Agreement at any time by sending a written notification to the Depositary through diplomatic channels. Withdrawal from the Agreement shall come into force six (6) months after the receipt of such a written notification by the Depositary.

This Agreement shall enter into force thirty (30) days after the date of the Depositary's receipt, through diplomatic channels, of the last written notification regarding the completion of the internal procedures of the Parties, as may be necessary for its entry into force.

Done in Serhetabad on 23rd day of February 2018 in three (3) originals, each in the English language, all texts being equally authentic.

For the Government of the Islamic Republic of Afghanistan	For the Government of Turkmenistan	For the Government of the Islamic Republic of Pakistan
		

Proposed Turkmenistan-Afghanistan-Pakistan Power Interconnection Project (TAP)



LEGENDS

1. 76km of 220kv Transmission Line (Hairatan – Naibabad – Mazar)
2. 165km of 220kv Transmission Line (Naibabad – Pul e Khumri)
3. 20km of 110kv Transmission Line (Sherkhan Bandar – Imam Sahib)
4. 157km of 220kv Transmission Line (Pul e Khumri – Sherkhan Bandar)
5. Switching Station at Sherkhan Bandar
6. Switching Station at Naibabad
7. 108 km 500kV TL Aqena to Andkhoy, Sheberghan & 142 km 220kV Sheberghan to Mazar
8. 74km 220kV TL Andkhoy to Sheberghan, 306 km 500kV TL Sheberghan to Dashte Alwan & 225 km 500kV Dashte Alwan to Kabul (TAP Phase 1)
9. 500kv Substations at Andkhoy, Sheberghan, Mazar, Dashte Alwan & Arghande
10. Convertor Station at Pule Khumri
11. 500 kV Transmission Line TKM-AFG-PAK (TAP Phase 2 - 600 kms)
12. CASA-1000 DC Transmission Line (565 kms in AFG)
13. 500/220-kV Substations at Herat and Kandahar

KEY

- Completed
- Ongoing
- Planned
- Transmission Line
- 500/220-kV Substation
- Switching Station
- Convertor Station

Project Infrastructure

1. Construction of 500-kV transmission infrastructure from TKM into AFG and to PAK
2. TAP sequenced into 2 phases
   - **1st Phase** : utilize TUTAP infrastructure to export Turkmen power into AFG and PAK.
   - Explore CASA-TUTAP complement
   - **2nd Phase** : new power interconnection along TAPI gas pipeline routing. The AC network would pick up generation from TKM and from AFG and transfer and disperse power in AFG and onto PAK

ADB as Anchor Development Partner

1. Four Meetings facilitated by ADB project secretariat ADB
2. Inter Governmental Agreement signed
3. ADB will initiate
   - analytical studies for systems stability, reliability, and grid interconnection
   - project assessment, including project feasibility, technical design,
   - coordinate project planning and provision of financing
   - facilitate energy trade negotiations,
   - finalize an implementation roadmap

Proposed Future Interventions

1. 500-kV Uzbekistan-Afghanistan Power Interconnection (Surkhan to Pule Khumri)
   - ADB to undertake design and prepare bidding documents and finance interconnection through AFG project savings
   - Project expected to be approved in Q4 2018
2. Study to support increase in regional power trade between KAZ, KGZ, TAJ and UZB
   - identifying obstacles for power trade within CAPS, and suggesting solutions
   - modernize the Coordinating Dispatch Center "Energiya"
   - supporting re-instatement of TAJ back into CAPS; and supporting acceptance of AFG into the CAPS