

Central Asia –South Asia Connectivity

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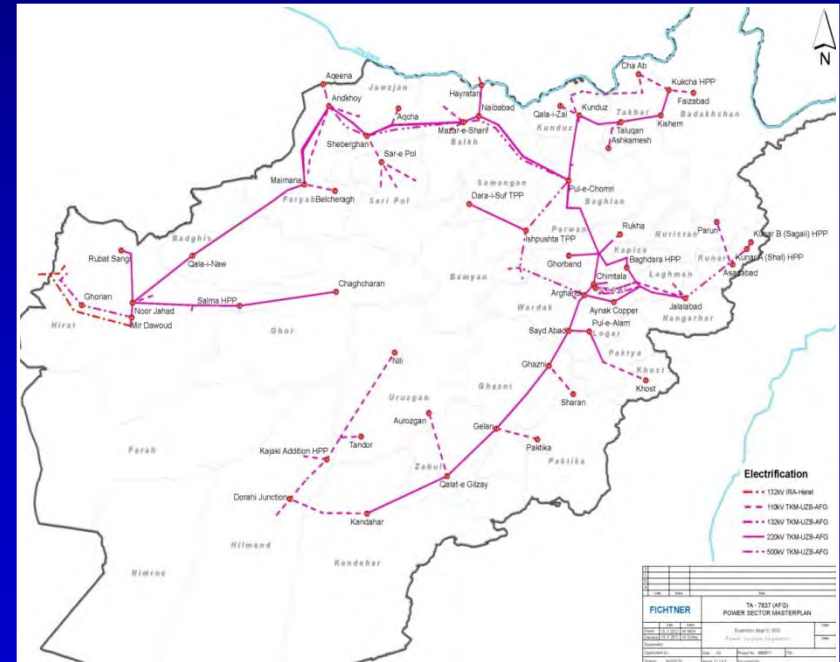
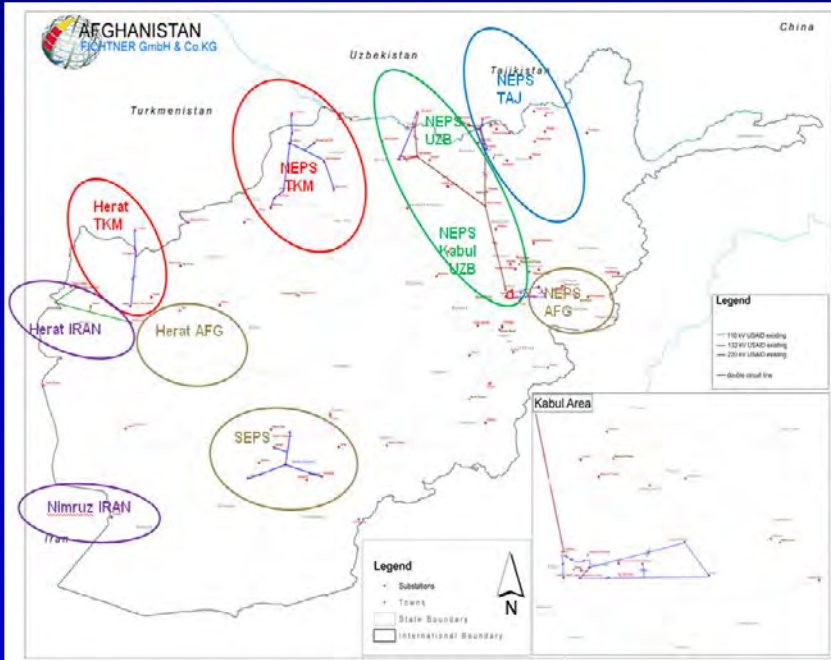
Impact of AFG power system developments

Today

- Multi island system
- Peak load 850MW
- Annual consumption 3800GWh
- 70% of the energy covered by imports

2032

- Integrated transmission network
- Peak load 3500 MW
- Annual energy consumption 18400 GWh
- Power exchange options with neighboring systems



Proposed Asynchronous Operation

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

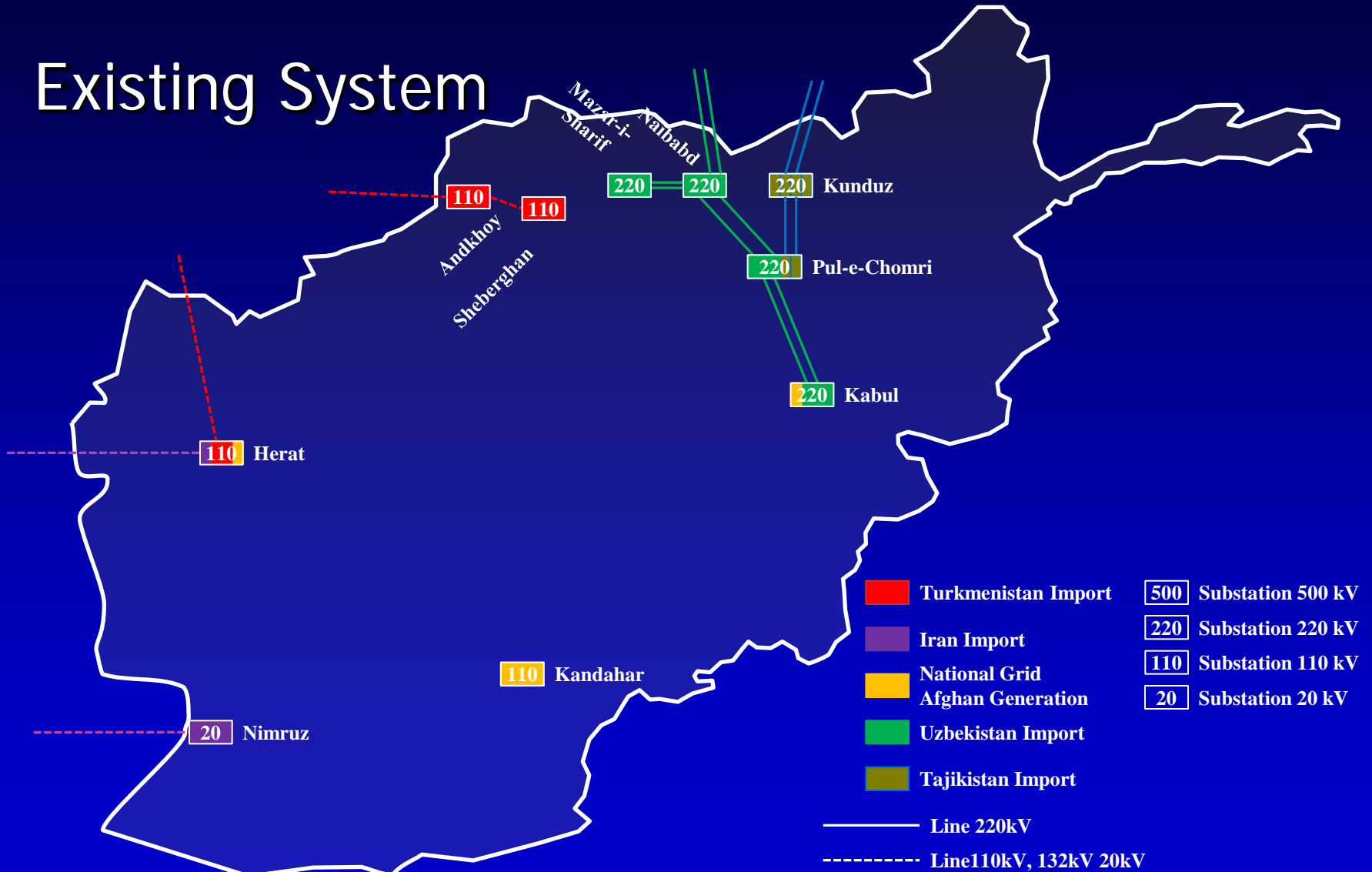


Benefits of HVDC back to back

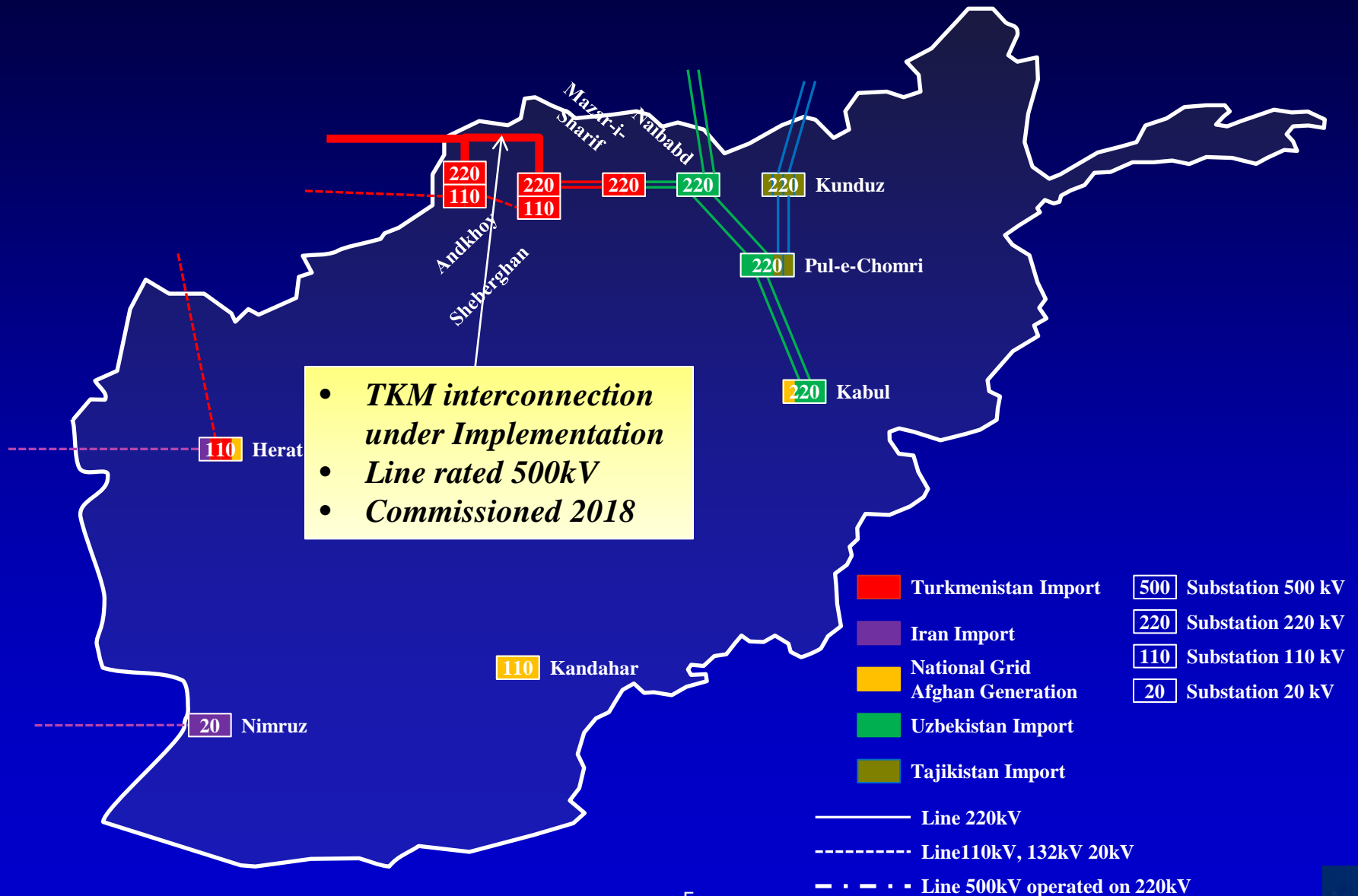
- Modular technology- built in stages to meet evolving needs
- Facilitates integration of remote diverse resources
- Controllable -power injected where needed
- No stability distance limitation
- Proven technology
- Facilitates power wheeling to Pakistan

Major Transmission Projects: Geographical representation (1)

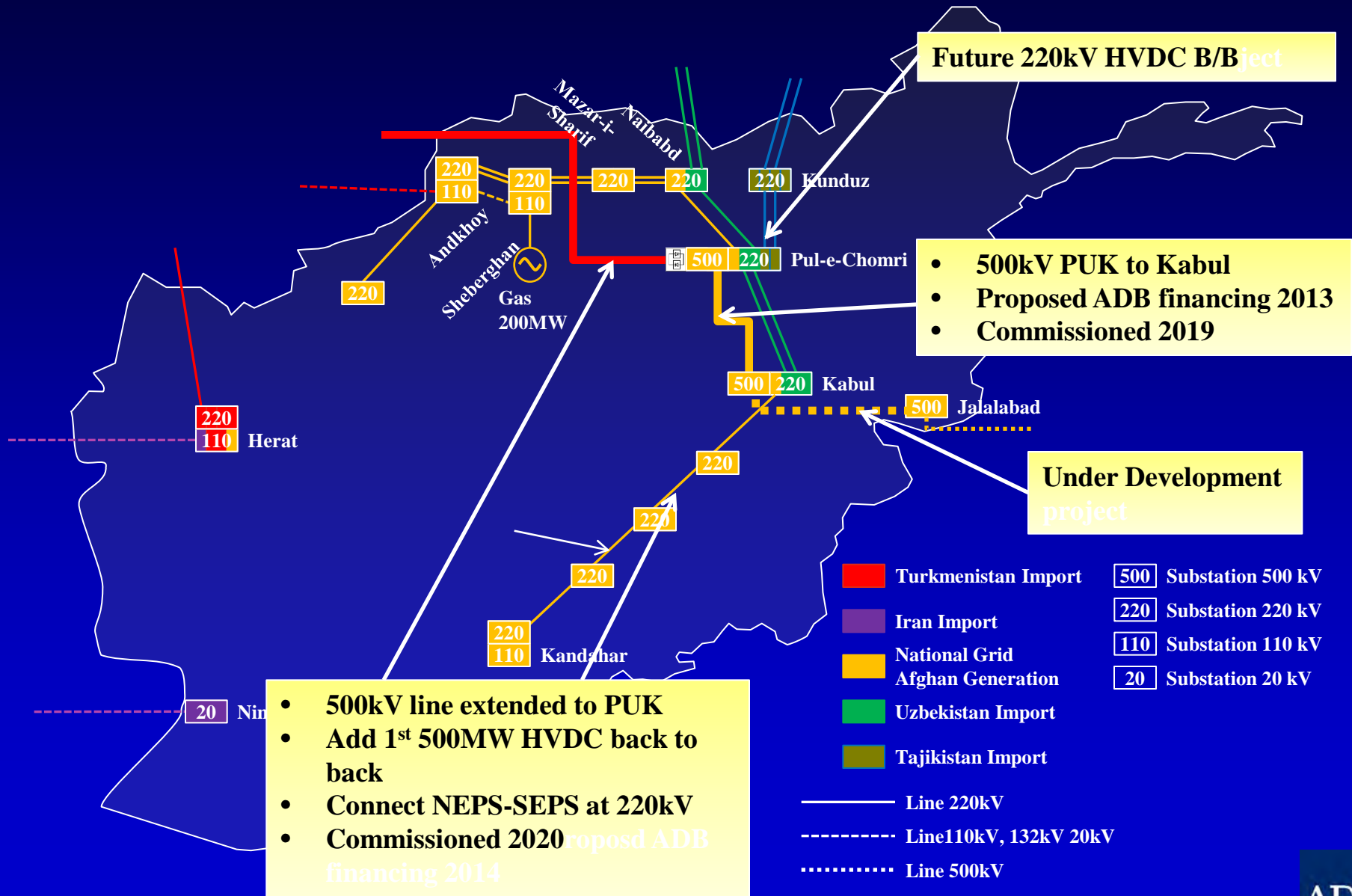
Existing System



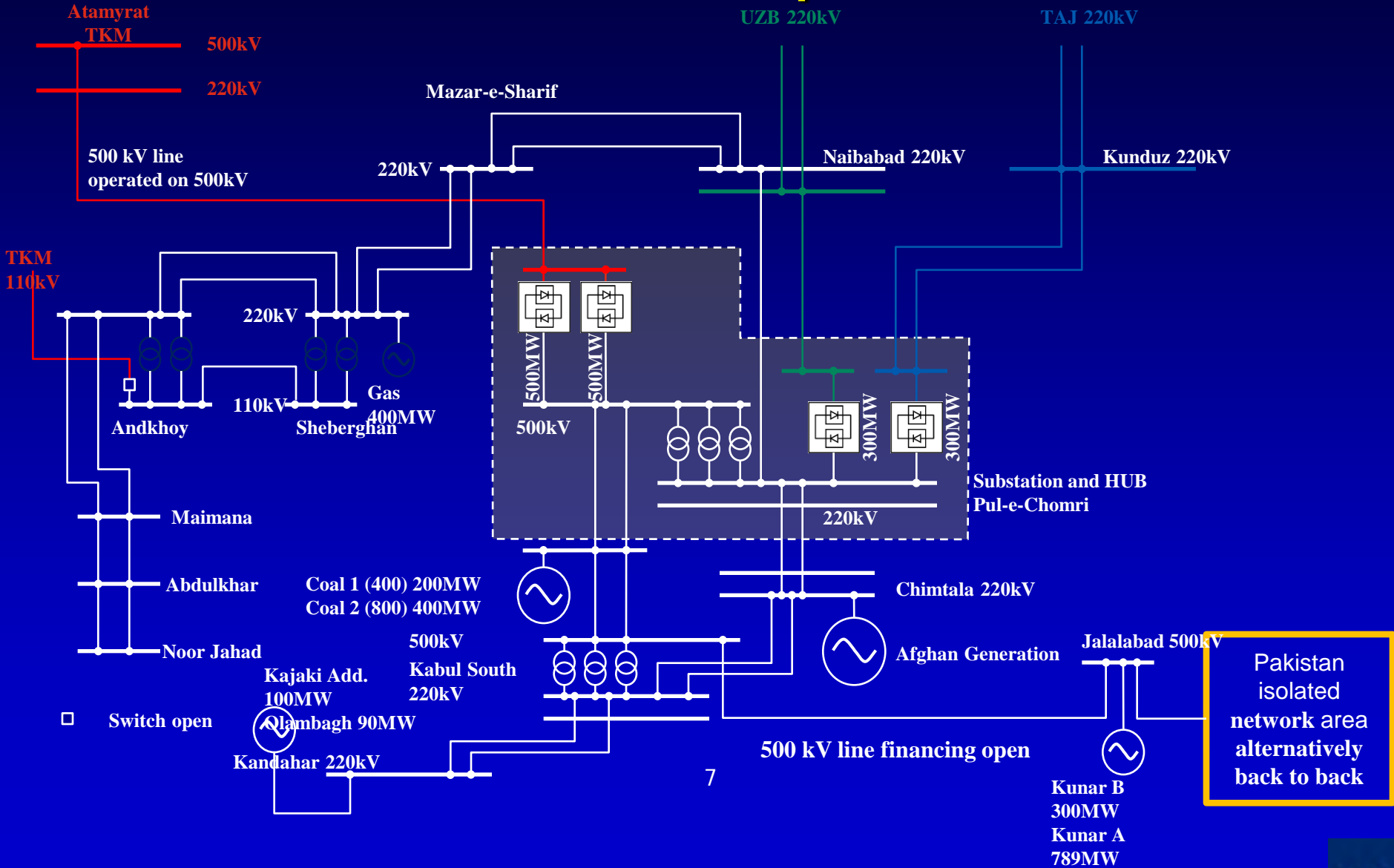
Major Transmission Projects: Geographical representation (2)

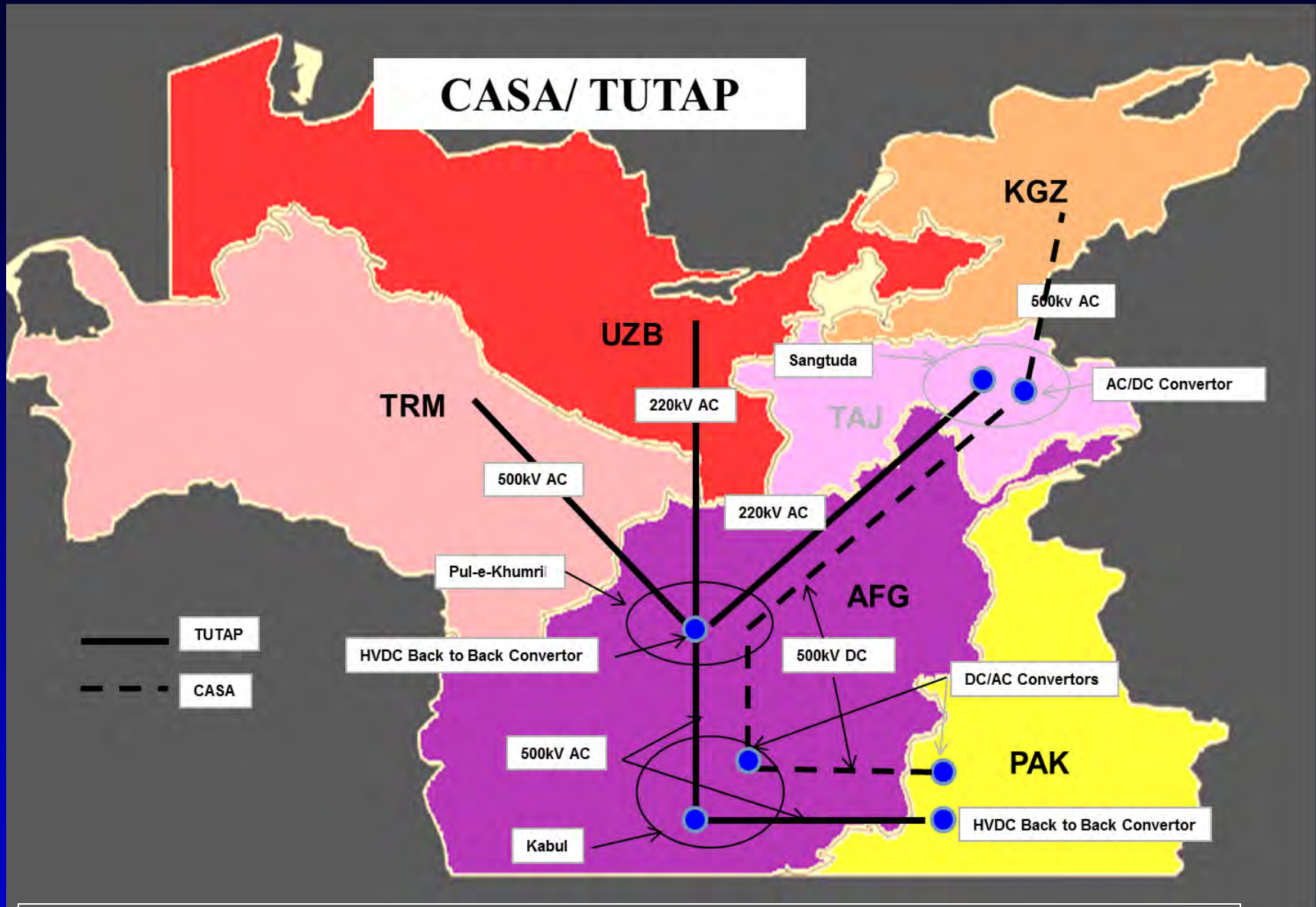


Major Transmission Projects: Geographical representation (3)



Transmission Development 2032

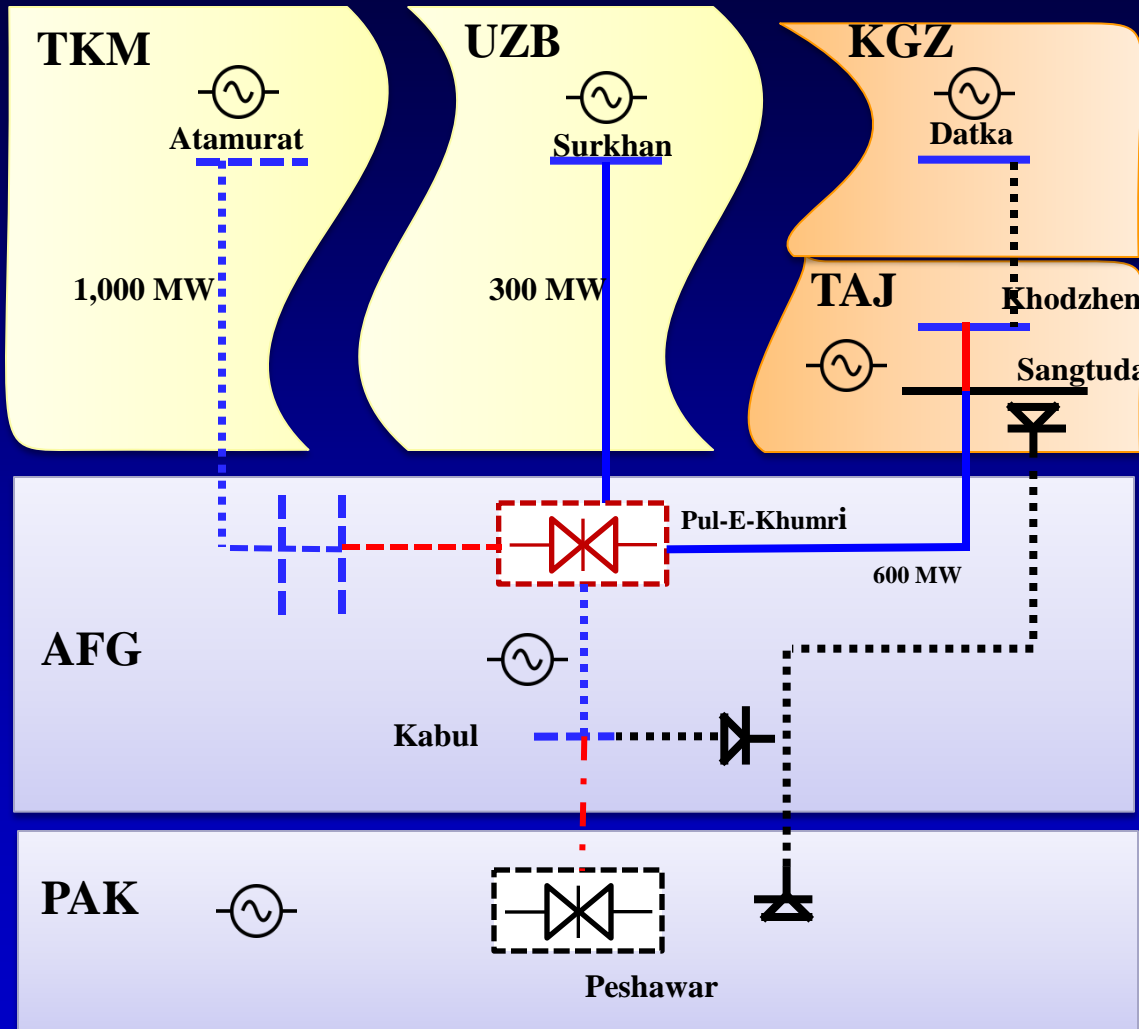




Projects have different purposes.....

- **CASA links KGZ and TAJ to PAK.**
- **TUTAP addresses AFG power needs with regional trade as a benefit.**

TUTAP/CASA Technical features



Legend

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

Integrating CASA and TUTAP

CASA-100

- Update Master Plan (MP) recommendations assuming CASA-1000 proceeds
- Consider options for exports from AFG grid and TAJ to PAK vis CASA-100

Turkmenistan

- Consider impact of different schedules for TKM to increase exports to 500MW

Tajikistan

- Revise MP findings with correct rating AFG-TAJ line of 600MW

Synchronization

- Refine synchronization options with neighboring countries and identify preferred option

Economic Comparison

Fichtner have been recruited to prepare addendum to Master Plan to address CASA integration. Draft Final Report due May 2014

Thank You

Questions?