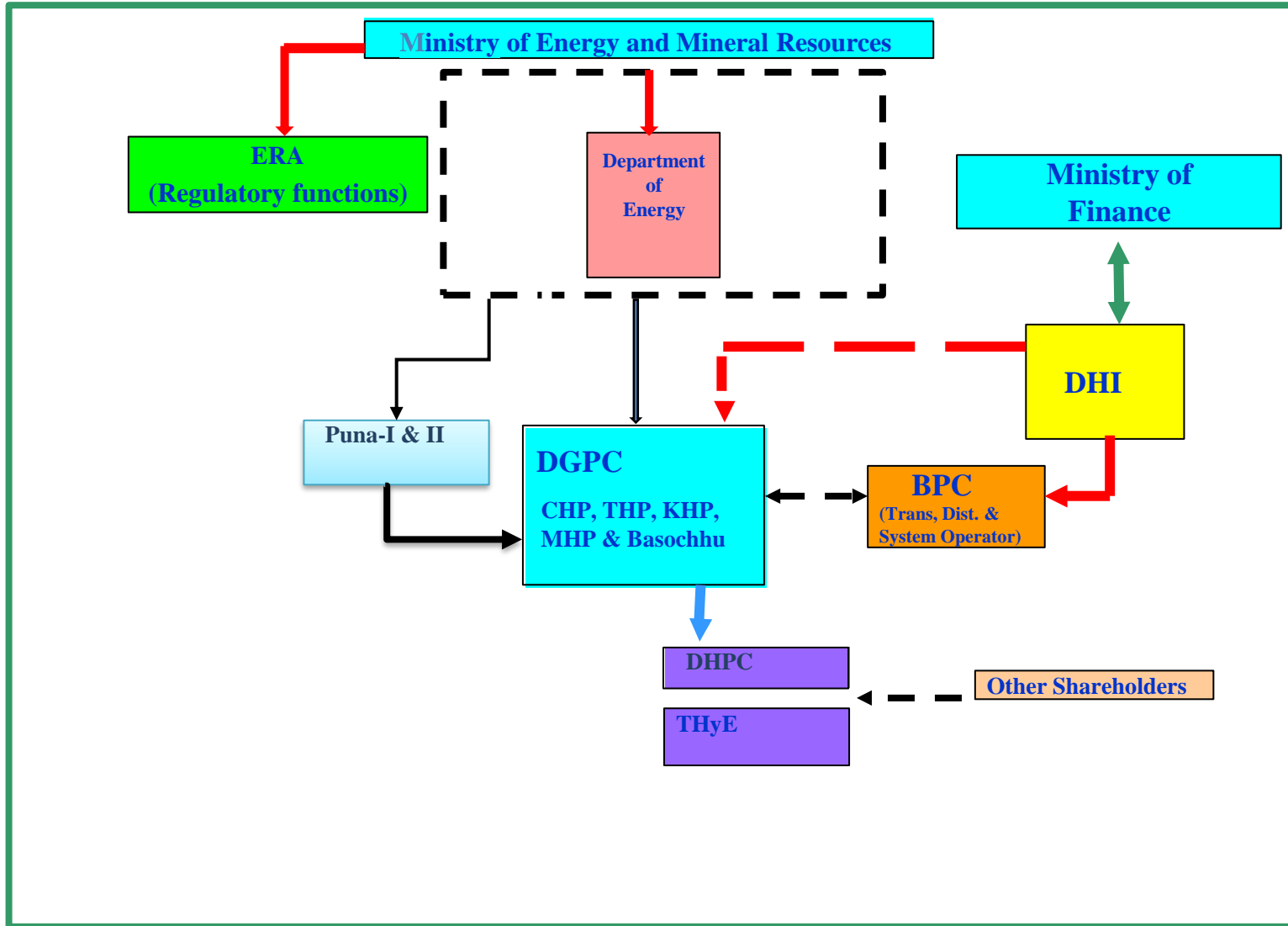


Transmission and Grid Interconnection and CBET

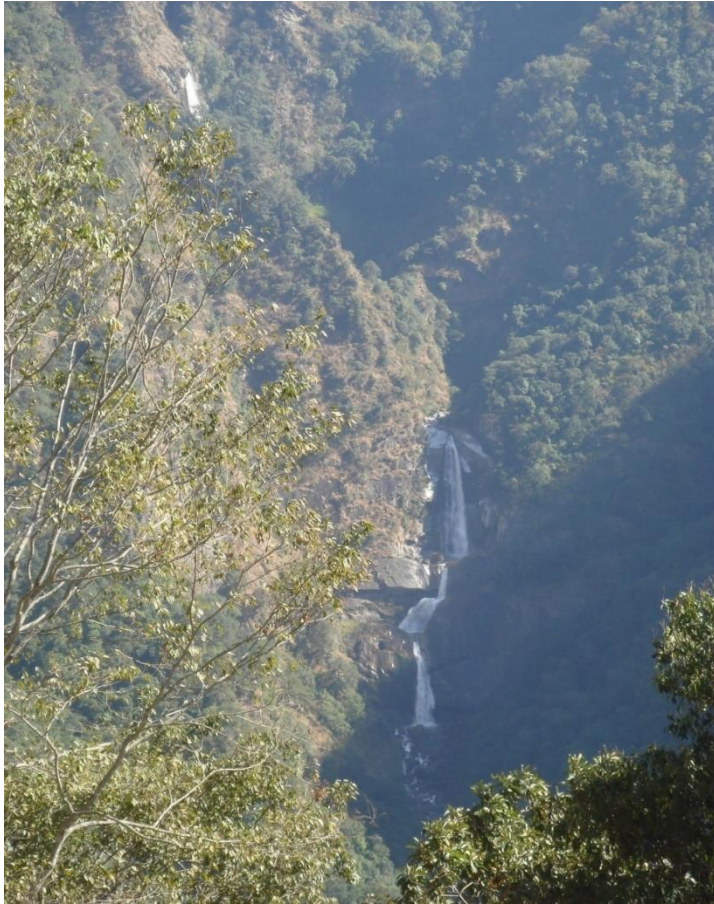
Bhutan

16/02/2023

Power Sector Overview



Hydropower Potential



The steep and rugged Himalayan topography and swift rivers promise huge hydropower potential

- ❑ 37 GW potential
- ❑ 33 GW techno-economic potential viable for development

Hydropower Plants Under Operation

Sl. No.	Power Plant	Installed Capacity	COD
		(MW)	
1	Chukha HPP	336	1986-88
2	Kurichhu HPP	60	2001-02
3	Basochhu HPP (Upper Stage)	24	2001
4	Basochhu HPP (Lower Stage)	40	2004
5	Tala HPP	1020	2006-07
6	Dagachhu HPP	126	2015
7	Mangdechu HPP	720	2019
8	Micro/Mini	8	
	Total	2,334	

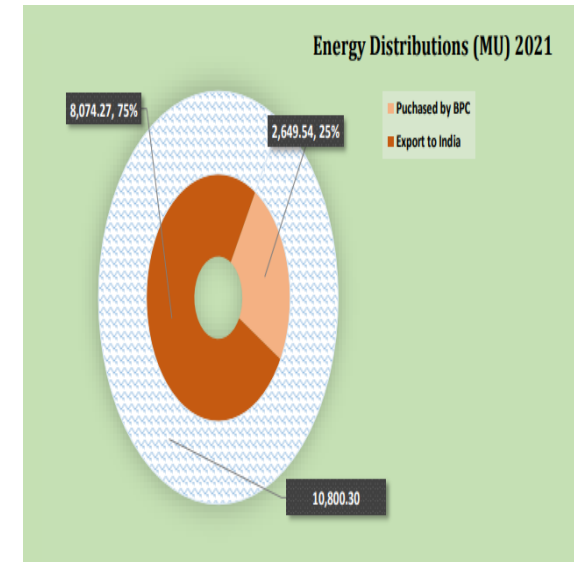
Hydropower projects under construction

SI/No	Name	IC(MW)	Firm Power(MW)
1	Punatsangchhu-I	1,200	199.00
2	Punatsangchhu-II	1,020	164.00
3	Kholongchhu	600	113.80
4	Nikachhu	118	22.55
Total		3,938	589.35

Power Generation & Domestic Demand

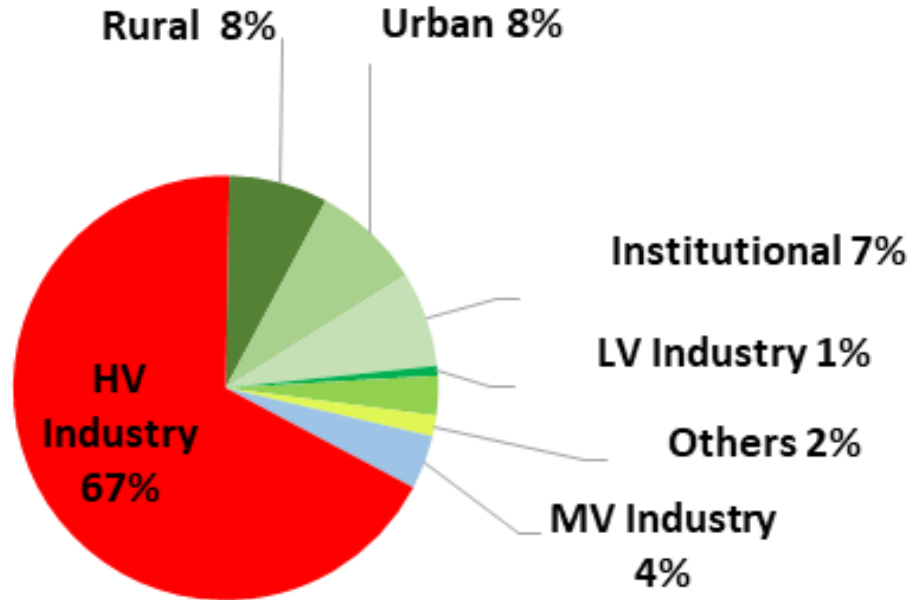
Year	2017	2018	2019	2020	2021
Total Generation (MU)	7,709.22	6,940.63	8,646.26	11,366.71	10,801.27
Domestic Load (MU)	2,185.75	2,328.44	2,280.63	1,961.31	2,578.04

Year	2017	2018	2019	2020	2021
National Peak Load (MW)	362.09	399.35	387.66	374.53	435.35



➤ Electricity coverage ratio is 99.9 %

Classification of Domestic Consumer

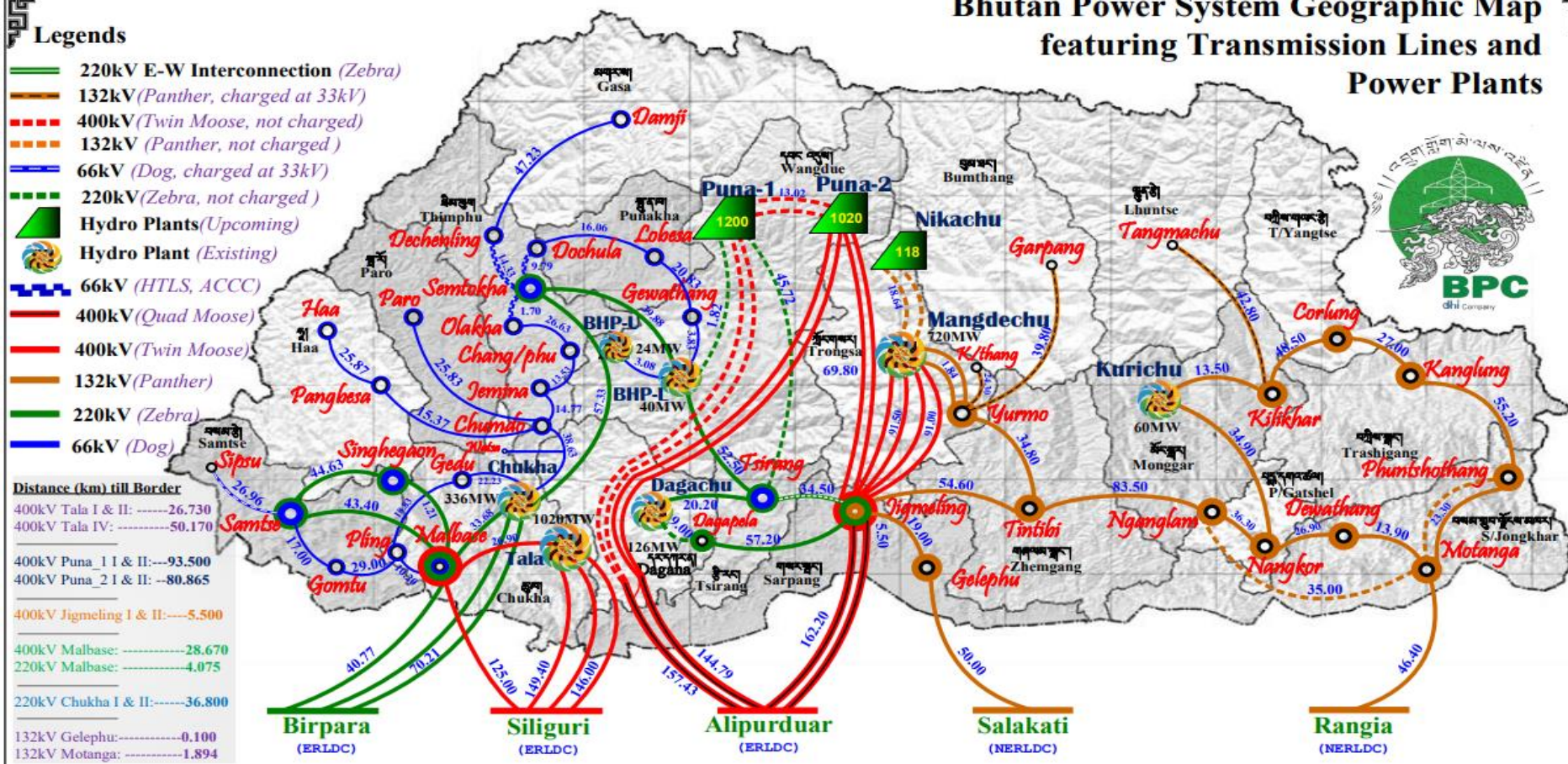


Existing Transmission Grid

Bhutan Power System Geographic Map featuring Transmission Lines and Power Plants

Legends

- 220kV E-W Interconnection (Zebra)
 - 132kV (Panther, charged at 33kV)
 - - - 400kV (Twin Moose, not charged)
 - - - 132kV (Panther, not charged)
 - 66kV (Dog, charged at 33kV)
 - - - 220kV (Zebra, not charged)
 - Hydro Plants (Upcoming)
 - Hydro Plant (Existing)
 - 66kV (HTLS, ACCC)
 - 400kV (Quad Moose)
 - 400kV (Twin Moose)
 - 132kV (Panther)
 - 220kV (Zebra)
 - 66kV (Dog)
- Distance (km) till Border**
- 400kV Tala I & II: -----26.730
 - 400kV Tala IV: -----50.170
 - 400kV Puna_1 I & II: ---93.500
 - 400kV Puna_2 I & II: ---80.865
 - 400kV Jigmeling I & II: ---5.500
 - 400kV Malbase: -----28.670
 - 220kV Malbase: -----4.075
 - 220kV Chukha I & II: -----36.800
 - 132kV Gelephu: -----0.100
 - 132kV Motanga: -----1.894



Network Developed by: **Bhutan Power System Operator (BPSO)** Date of Revision: **11-November-2021**

Total Installed Capacity: 2326 MW	Longest Transmission Line: 162.20 km	Number of Gencos: 1 (DGPC)	Number of Discos: 1 (BPC)
Highest Voltage System: 400 kV	Sources of Power: All Hydro	Number of Transcos: 1 (BPC)	Power Export: ~70-75%
			Number of Cross-border Lines: 13
System Operator: BPSO (BPC)			

Existing status of CBET in the country

- CHP, THP, KHP and MHEP are under long term PPA with PTC India for the sale of surplus power from Bhutan
- Dagachhu HEP sells its power to TPTCL India
- Tala was under shutdown in lean season
- Bhutan requested India for import of power up to 400MW in their Power Exchange
- DGPC was appointed as trading entity from Bhutan and PTC India Limited from Indian side
- Imported power from Indian Power Exchange(IEX)from 1st Jan-16th March 2022
- Total import: 240 MU

Priorities/Challenges

- Delays in the implementation of the 10,000 MW by 2020 projects
- **Energy security** during lean river discharge winter months
 - Run of the river hydropower plants
 - Demand outstripping supply
 - Bhutan is expected to import power during the upcoming lean months until substantial additional firm power capacity are added

THANK YOU