

India's power cooperation with its neighbors: Nepal, Bhutan and Bangladesh

Ravinder

Regional Advisor on Energy

ravinders.only@gmail.com

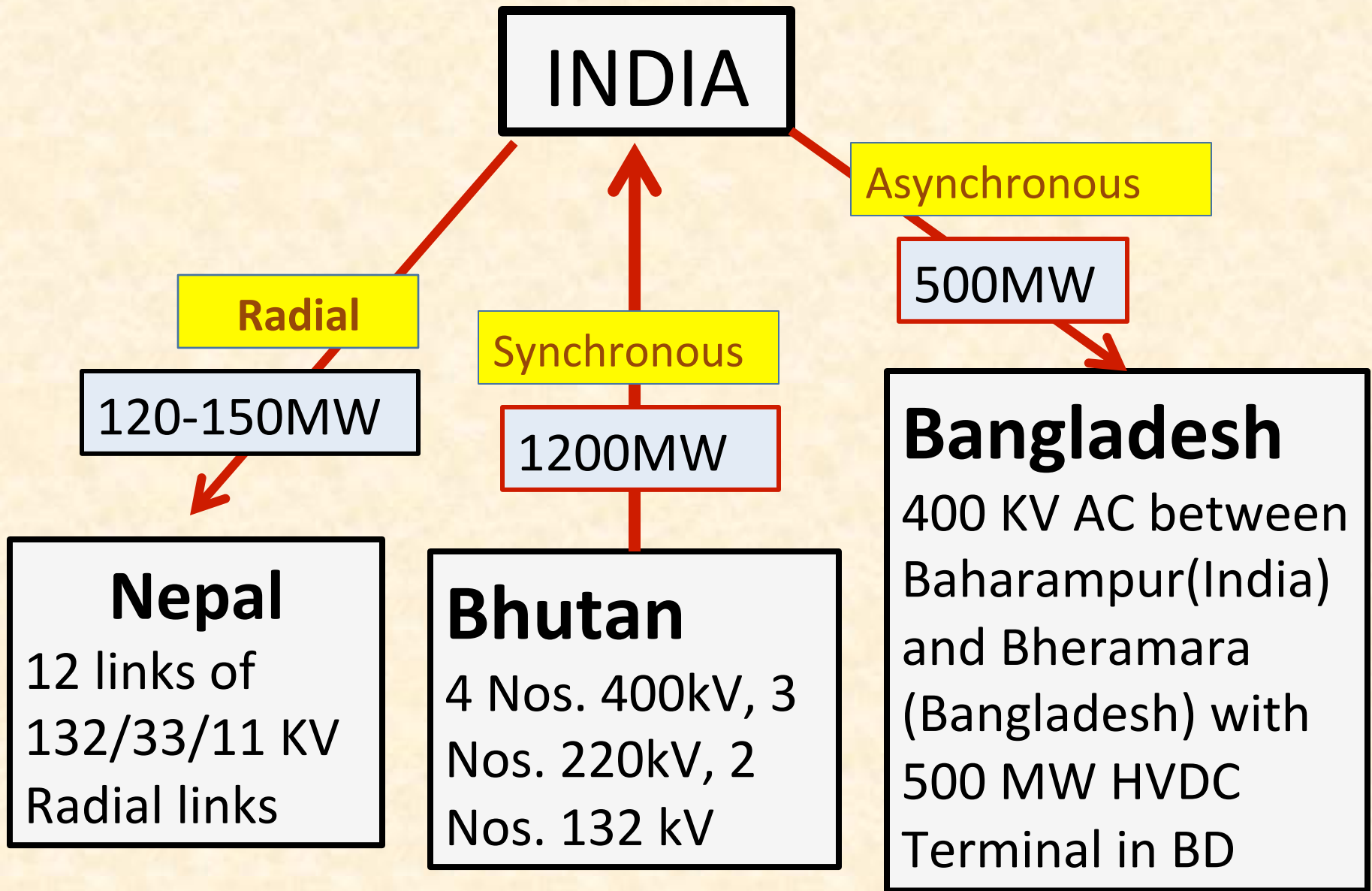
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Installed Capacity [GW]

Country	Installed Capacity	Peak demand
Bangladesh	10.35 GW	6.6 GW
Bhutan	1.5 GW	0.3 GW
India	250.2	147 GW
Nepal	0.75 GW	1. 2 GW

Per Capita Consumption

Bangladesh	321
Bhutan	2420
India	917
Nepal	116



Month	Bhutan Export	Nepal Import	Bangladesh Import
Apr 13	179.42	59.98	-
May 13	411.65	44.45	-
Jun 13	800.48	42.08	-
Jul 13	986.50	57.06	-
Aug 13	1004.99	57.94	-
Sep 13	793.52	48.98	-
Oct 13	691.96	47.60	90.58
Nov 13	310.10	39.75	98.80
Dec 13	158.63	70.43	286.99
Jan 14	93.06	78.01	323.76
Feb 14	56.38	70.87	314.83
Mar 14	68.49	84.88	333.23
Total (MUs)	5555.18	702.03	1448.19

Existing HEPs in Bhutan for Export

Name	Installed Capacity (MW)	Year of Commissioning	Average Annual Energy (MUs)
Chukha HEP	336 (4x84)	1986-88	2,024
Basochhu-I HEP	24 (2x12)	1999	105
Kurichhu HEP	60 (4x15)	2000-01	400
Basochhu-II HEP	40 (2x20)	2004	291
Tala HEP	1020 (6x170)	2006-07	4,865
TOTAL	1480		7,865

Bhutan: Under construction for Export

HEP	Installed Capacity (MW)	Annual Energy (MUs)	Grant	Loan
Punatsangchhu-I	1,200	5,543	40%	60%
Punatsangchhu-II	1,020	2,424	30%	70%
Mangdechhu	720	2,925	30%	70%

Bhutan: Ready for implementation for Export

Capacity and Name of HEP	JV partners
600 MW Kholongchu HEP	SJVN Ltd., India & DGPC Bhutan
180 MW Bunakha	THDC Ltd. & DGPC Bhutan
570 MW Wangchu HEP	SJVN Ltd. of & DGPC Bhutan
770 MW Chamkarchu HEP	NHPC Ltd. of & DGPC Bhutan

Bhutan: In pipeline for export

HEP	MW	MoU date	Status	Develop ment Model
Sunkosh Reservoir	2,560	Mar 2010	DPR pending with CEA	Bilateral
Kuri-Gongri	1,800	-	DPR not ready	Bilateral
Amochhu Reservoir	540	-	DPR approved	Bilateral

Nepal: Projects for Export

- Pancheshwar HEP with Rupaligad (5,600MW + 240 MW)
- Sapta Kosi High Dam Multipurpose Project (3300 MW)
- IPPs [28 survey licences for 8,249 MW]

Nepal: Issues

- Project Development Agreement
- Power Trade Agreement with India
- Long-term PPA
- Financial Closure
- Transmission Plan for export to India etc.

Bangladesh: Future

- Doubling HVDC to 1000MW
- 100MW radial to North Comilla
- 1000MW from Rangia/Rowta

SAARC Grid

- SAARC grid is the stitching of national grids with strong and multiple cross-border interconnections
- The evolution of SAARC electricity grid has begun with Bangladesh, Bhutan, India and Nepal connected
- Being operated through real-time coordination between the grid operators of India, Nepal, Bhutan and Bangladesh

SAARC Grid

- Grid operation protocols covering safety, , liaison, outage planning, recovery procedures, event recording, scheduling and dispatch, congestion management, metering, accounting, deviation settlement etc. have been developed

SAARC electricity market

- Given the diverse conditions prevailing in different South Asian countries and India being the only country with sizable internal market based on voluntary participation, it is apparent that SAARC electricity market has to be a voluntary market built by plugging in to the Indian market
- Evolution of SAARC electricity market has in fact begun with Bangladesh, Bhutan, India and Nepal as participants

Thank you