

Status of Bangladesh Cross Border Interconnections with India and Expected Benefits

Md. Mizanur Rahman

Chief Engineer, Planning and Design, BPDB

March 19, 2014



Economy of Bangladesh at a Glance

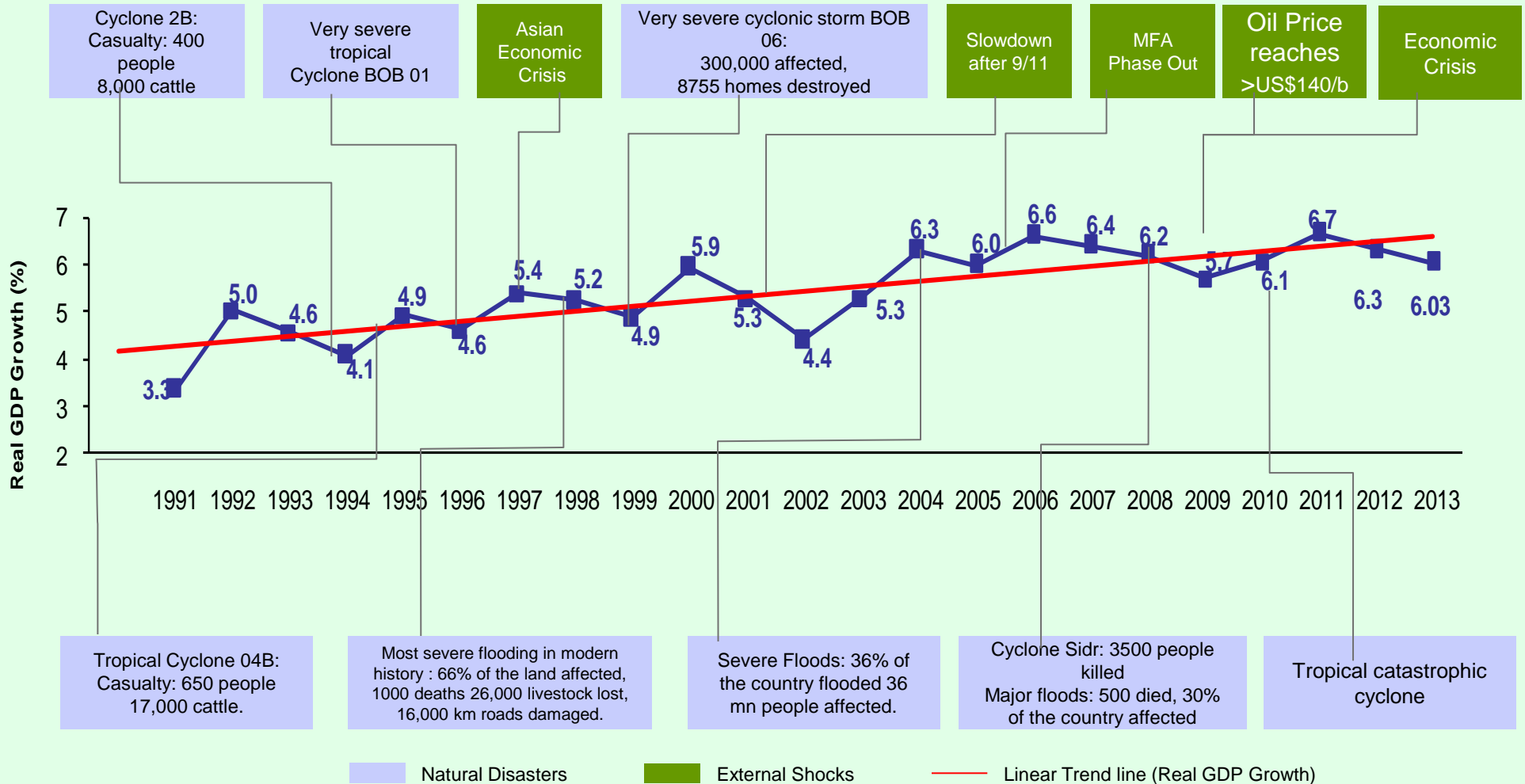


- **Official Name : People's Republic of Bangladesh**
- **Political System: Parliamentary Democracy**
- **Area : 147,570 km²**
- **Population : 154 million**
- **Total Exports : USD 27 billion (FY2013)**
- **Total Imports : USD 34 billion (FY2013)**
- **Remittance : USD 14.5 billion (FY2013)**
- **Forex Reserve : USD 18 billion**
- **GDP total : USD 131 b (FY 2013)**
- **GDP Per Capita : USD 1044 (FY 2013)**
- **Power Capacity : 10,000 MW**

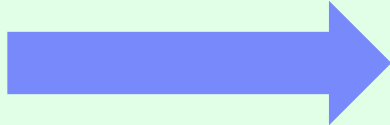
GROWTH IS REMARKABLY STABLE AGAINST ALL SHOCKS

Resilient growth despite regular political, environmental and external setbacks

Bangladesh has maintained consistent growth and never defaulted on its internal or external debt obligations despite the Asian and Global Financial Crises, numerous political upheavals and countless natural disasters. This consistency is practically unrivaled amongst countries of a similar level of development



GDP Growth, Electricity Demand and Challenges

- With sustained GDP Growth, Electricity demand is increasing at a rate of 9 -12 % 
- To meet this demand growth, power sector is facing challenges mainly:
 - Shortage of primary fuel supply from indigenous resources
 - Financing capital intensive power projects

Strategic Policy on Power

- Fuel diversity and sustainable supply of primary fuel
- Private sector participation in power generation
- Harnessing renewable energy resources
- Demand Side Management (DSM) and Energy Efficiency improvement program
- Regional Co-operation on Cross Border Power Trade

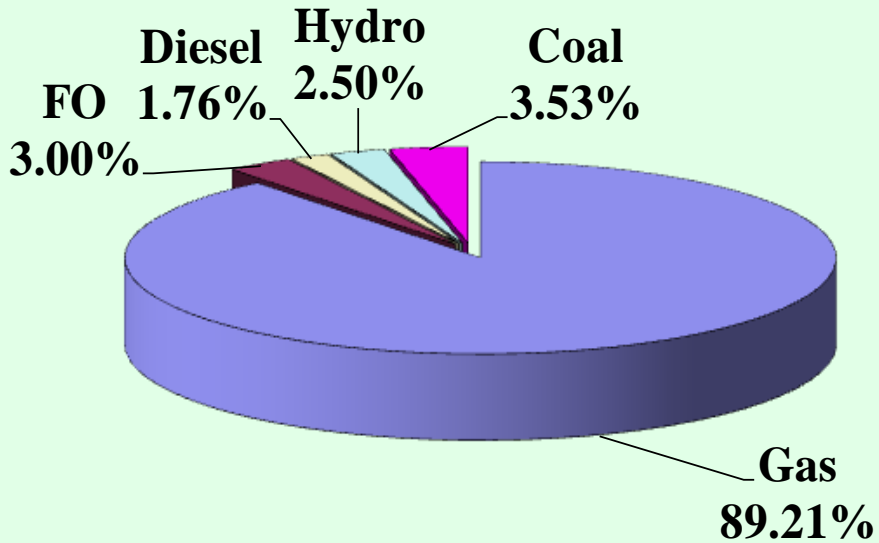
Bangladesh's Power Sector: At a Glance

- Generation Capacity : 10,213 MW
- Electricity Growth : 9% (FY-2013) ; 12 % (FY-2012)
- Total Consumers : 14.2 Million
- Transmission Lines : 9,300 km
- Distribution Lines : 290,000 km
- Per Capita Generation : 321 kWh (including Captive)
- Access to Electricity : 62 % (including 7 % RE)

Primary Fuel Supply Options

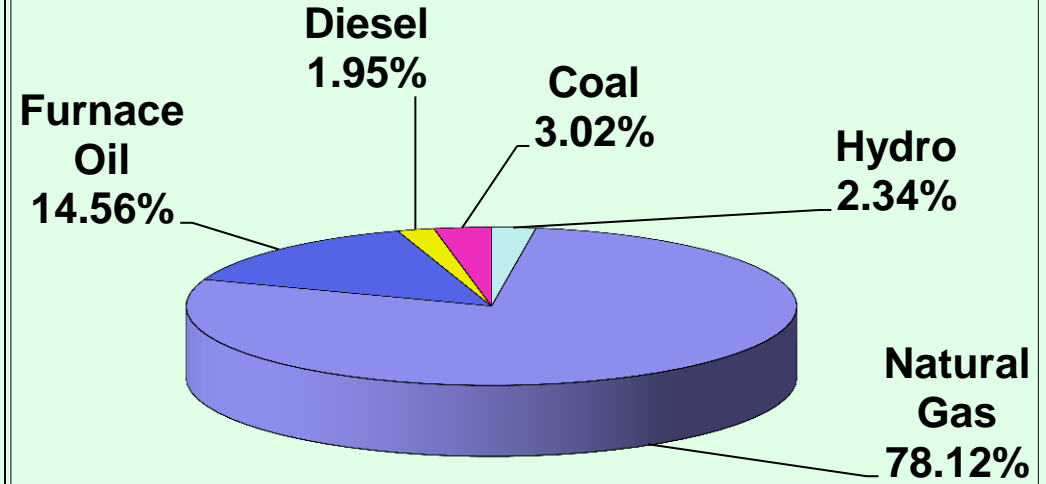
Fuel Mix: FY-2010 & 2013

FY-2010



Total Net Generation : 29,247 MkWh

FY-2013



Total Net Generation : 38,229 MkWh

Primary Fuel Options: Indigenous Resources

- **Gas: Only 16 tcf proven reserve;** No significant gas discovery in recent years; Depleting gas reserve restricts gas based generation expansion; R/P ratio is only about 20 years.
- **Hydro:** Present capacity 230 MW and average energy generation- 800 GWh; **No further significant potential**
- **Coal: Total 3.2 billion ton reserve in 5 mines;** Near term option; Base Load
- **Renewable:** Present capacity only 120 MW; still high cost

Primary Fuel Supply Options: Import

Import Options as Indigenous resources are Inadequate

- Coal Import: Indonesia, Australia, South Africa
- LNG Import
- Oil- Volatile Market
- Nuclear
- Regional Hydro Power Import- Cross Border Trade

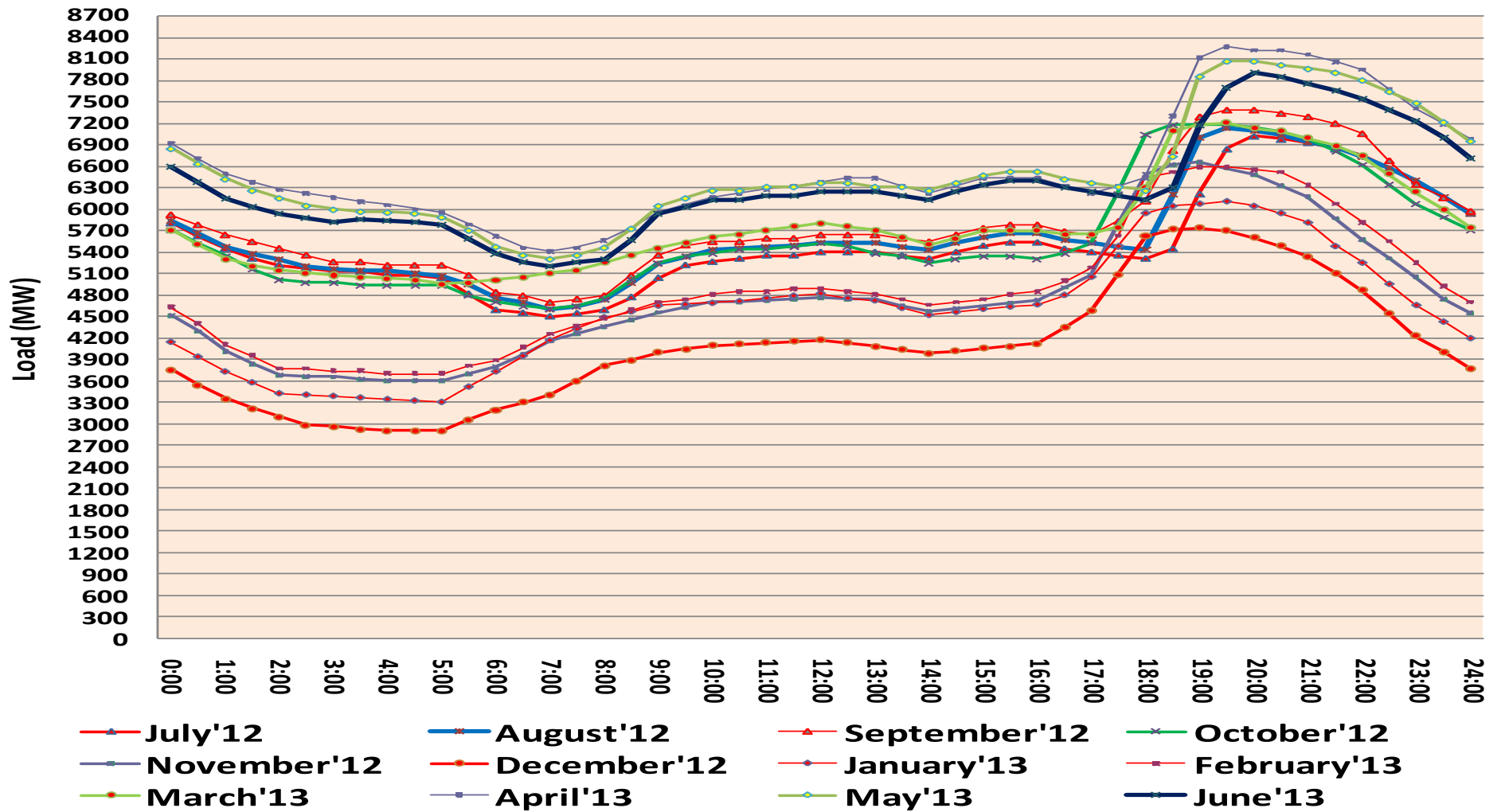
Long Term Power Generation Expansion Plan

PSMP Peak Demand Forecast 2030

FY	GDP growth rate	Elasticity	Effect of DSM	Electricity growth rate	Total Demand without DSM	Total Demand with DSM	Off-grid captive demand	Grid System Demand with DSM
Unit	[%]	-	[%]	[%]	[MW]	[MW]	[MW]	[MW]
2010	5.5%	1.50	5.0%		7,454	7,454	1,000	6,454
2011	6.7%	1.50	5.0%	4.5%	8,203	7,793	1,027	6,765
2012	7.0%	1.50	5.0%	10.5%	9,064	8,611	1,093	7,518
2013	7.0%	1.50	5.0%	10.5%	10,016	9,515	1,166	8,349
2014	7.0%	1.50	5.0%	10.5%	11,068	10,514	1,246	9,268
2015	7.0%	1.50	5.0%	10.5%	12,230	11,618	1,335	10,283
2016	7.0%	1.50	5.0%	10.5%	13,514	12,838	1,433	11,405
2017	7.0%	1.50	5.0%	10.5%	14,933	14,186	1,542	12,644
2018	7.0%	1.50	5.0%	10.5%	16,501	15,676	1,662	14,014
2019	7.0%	1.50	5.0%	10.5%	18,233	17,322	1,794	15,527
2020	7.0%	1.40	6.0%	8.6%	20,020	18,819	1,515	17,304
2021	7.0%	1.35	6.5%	8.9%	21,912	20,488	1,649	18,838
2022	7.0%	1.30	7.0%	8.5%	23,906	22,233	1,790	20,443
2023	7.0%	1.25	8.0%	7.6%	25,998	23,918	1,925	21,993
2024	7.0%	1.20	9.0%	7.2%	28,182	25,645	2,064	23,581
2025	7.0%	1.15	10.0%	6.9%	30,450	27,405	2,206	25,199
2026	7.0%	1.10	11.0%	6.5%	32,795	29,187	2,349	26,838
2027	7.0%	1.05	12.0%	6.1%	35,205	30,981	2,494	28,487
2028	7.0%	1.00	13.0%	5.8%	37,670	32,773	2,638	30,134
2029	7.0%	1.00	14.0%	5.8%	40,306	34,664	2,790	31,873
2030	7.0%	1.00	15.0%	5.8%	43,128	36,659	2,951	33,708

Typical Demand Curve

Typical demand for FY 2012-2013



Power Generation Plan: Primary Fuel Sources by 2030

Sl. No.	Description	Capacity (MW)	%	Possible Location (s)
1	Domestic Coal	11,250	51	North West Region at Mine Mouth
2	Imported Coal	8,400		Chittagong and Khulna
3	Domestic Gas/LNG	8,850	23	Gas- Near Load Centers LNG- Near Costal Area
4	Regional Grid	3,500	9	Bahrampur - Bheramara, Silchar - Fenchuganj, Purnia- Barapukuria- Bongaigaon, Myanmar - Chittagong
5	Nuclear	4,000	10	Rooppur
6	Others (Oil, Hydro and Renewable)	2,700	7	Near Load Centers
Total		38,700		

Road Map for Coal Power Development (as of 2030)

Domestic Coal

K-D-P 6x1000 MW USC
K-D-P 8x 600 MW USC

Import Coal

Meghnaghat 2x600MW

Zajira/New Meg 3x600MW

Chittagong 3x660MW

Moheshkhali/Matarbari 4x600MW

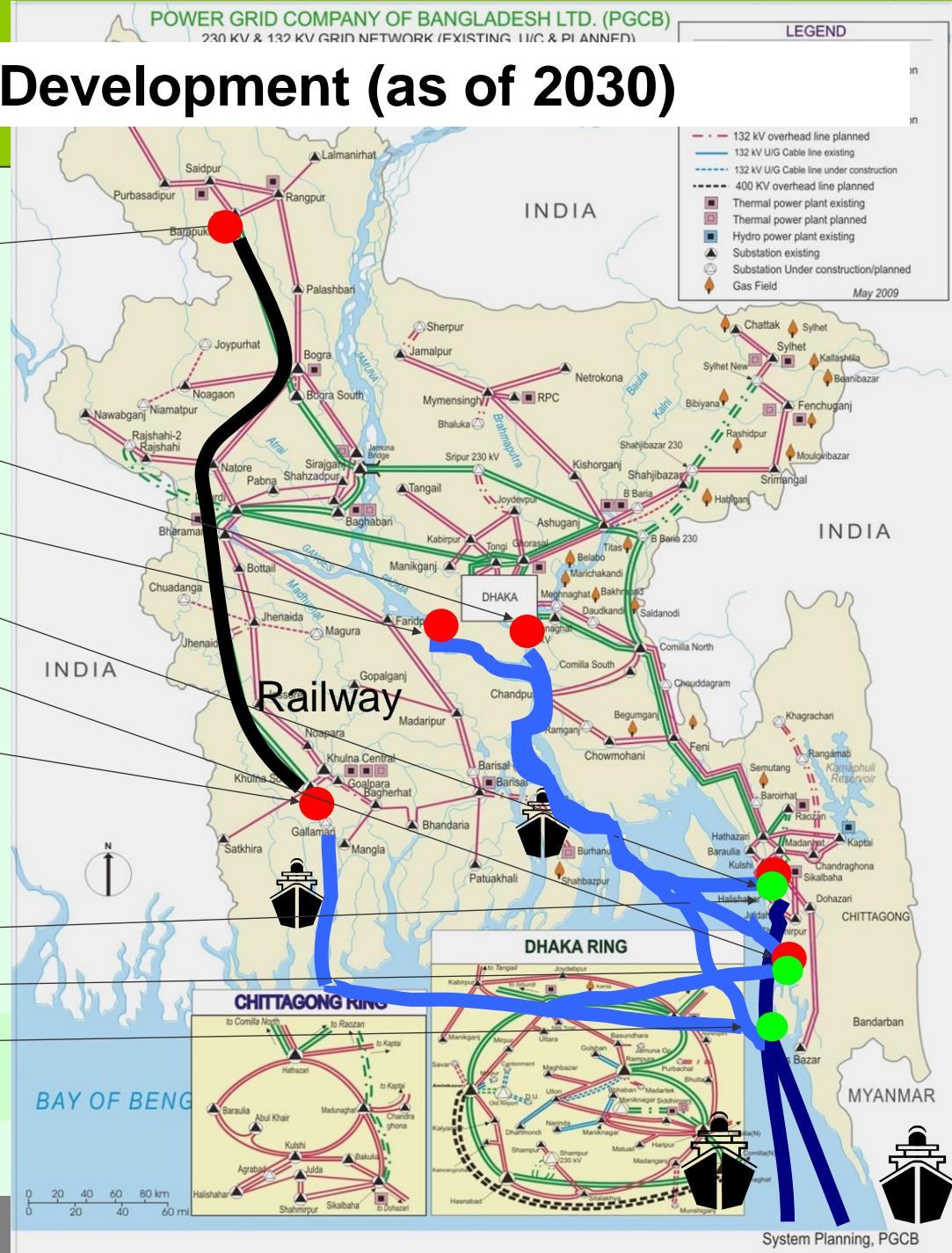
Khulna 2x660MW (Dom Future)

Total 19,200MW (New)

Coal Center

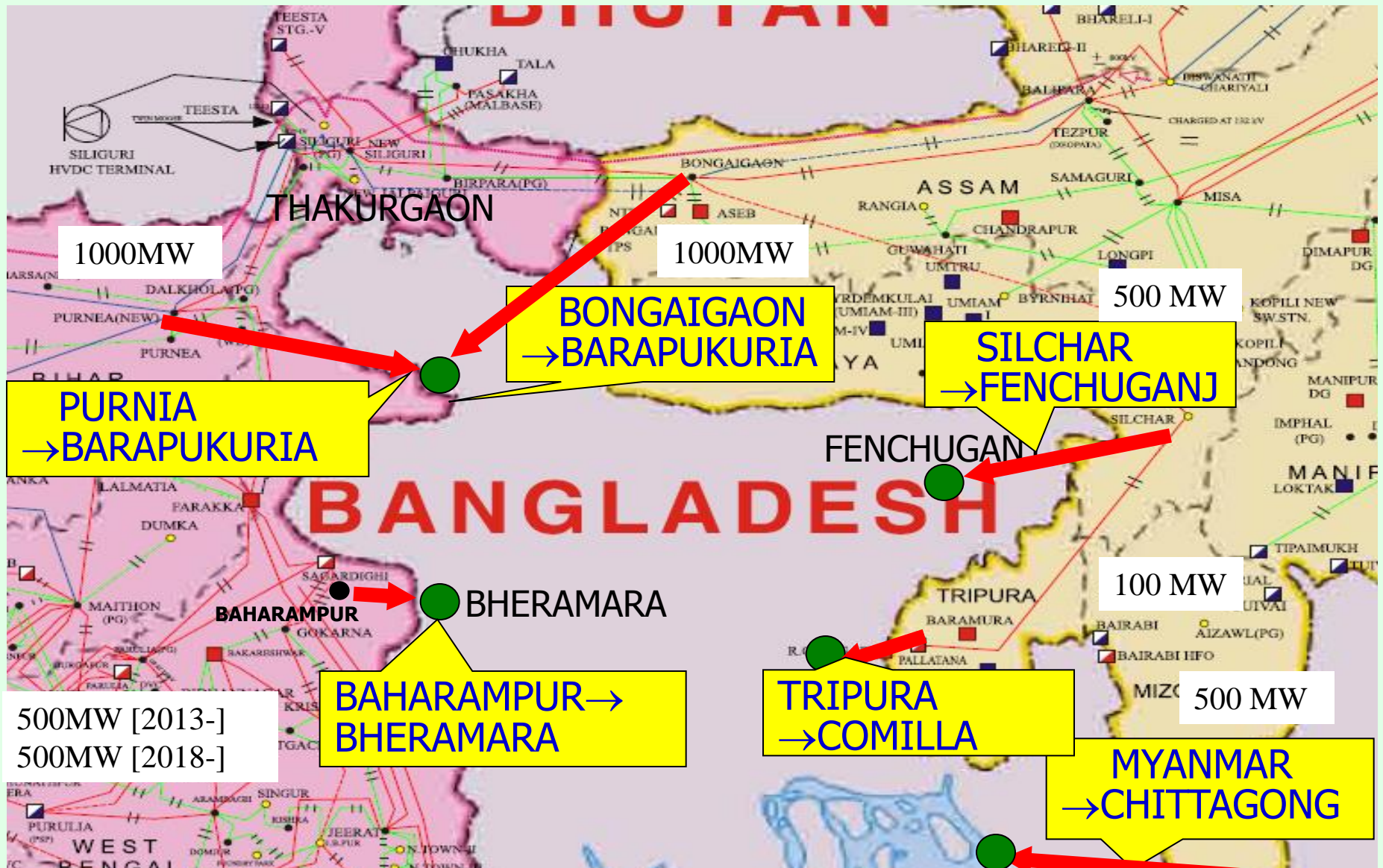
- Chittagong
- Matarbari
- Moheshkhali Island

- Potential Coal PS
- Potential Coal Center
- Ocean-going vessel
- Transship



--- 132 KV overhead line planned
--- 132 KV U/G Cable line existing
--- 132 KV U/G Cable line under construction
--- 400 KV overhead line planned
■ Thermal power plant existing
■ Thermal power plant planned
■ Hydro power plant existing
■ Substation existing
○ Substation Under construction/planned
■ Gas Field
 May 2009

Regional Power Exchange: Possibilities



Bangladesh – India Co-operation on Power Trade

□ Bangladesh-India signed a MOU on 11.01.2010 to promote technical, bilateral co-operation in power sector development

❖ **Salient Features of MOU**

✓ Exchange of power

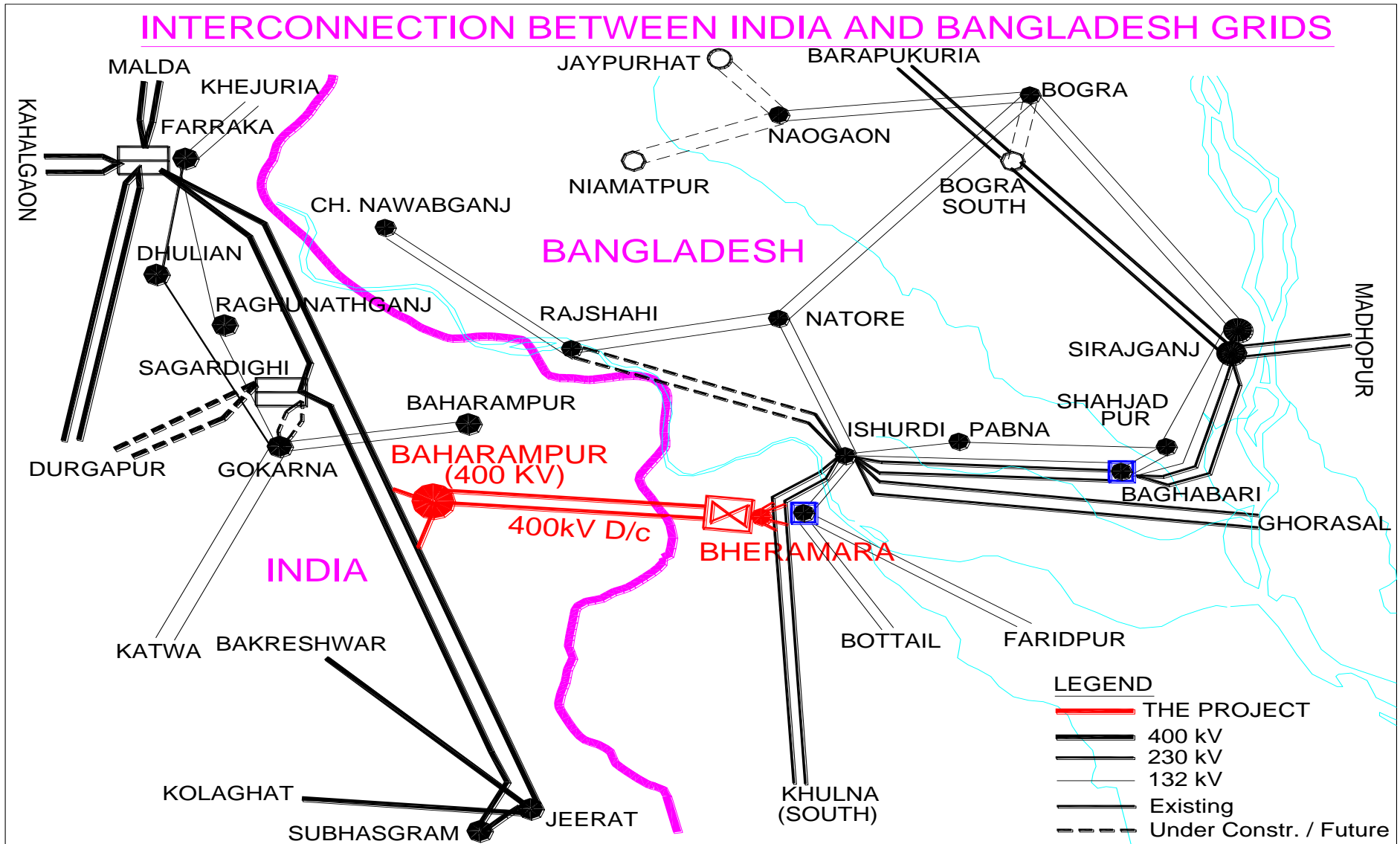
✓ Grid connectivity between the two countries

□ Joint technical team proposed an interconnection between Bheramara in Bangladesh and Baharampur in India.

✓ Establishment of 400 KV, 100 km double circuit line from Bheramara to Baharampur and back-to-back HVDC station at Bheramara

✓ 500 MW power import by 2013

First Regional Power Inter-Connection Line



Grid Interconnection Project

Implementation Status:

400 kV Transmission line (Bangladesh part):

- **Contract Signed : 30-Dec-2010**
- **Contractor : Cobra, Spain**
- **Consultant : PGCIL, India**
- **Target of Completion : May, 2013**
- **Actual Completion date: 30th June, 2013**
- **Line energized : 30th August, 2013**

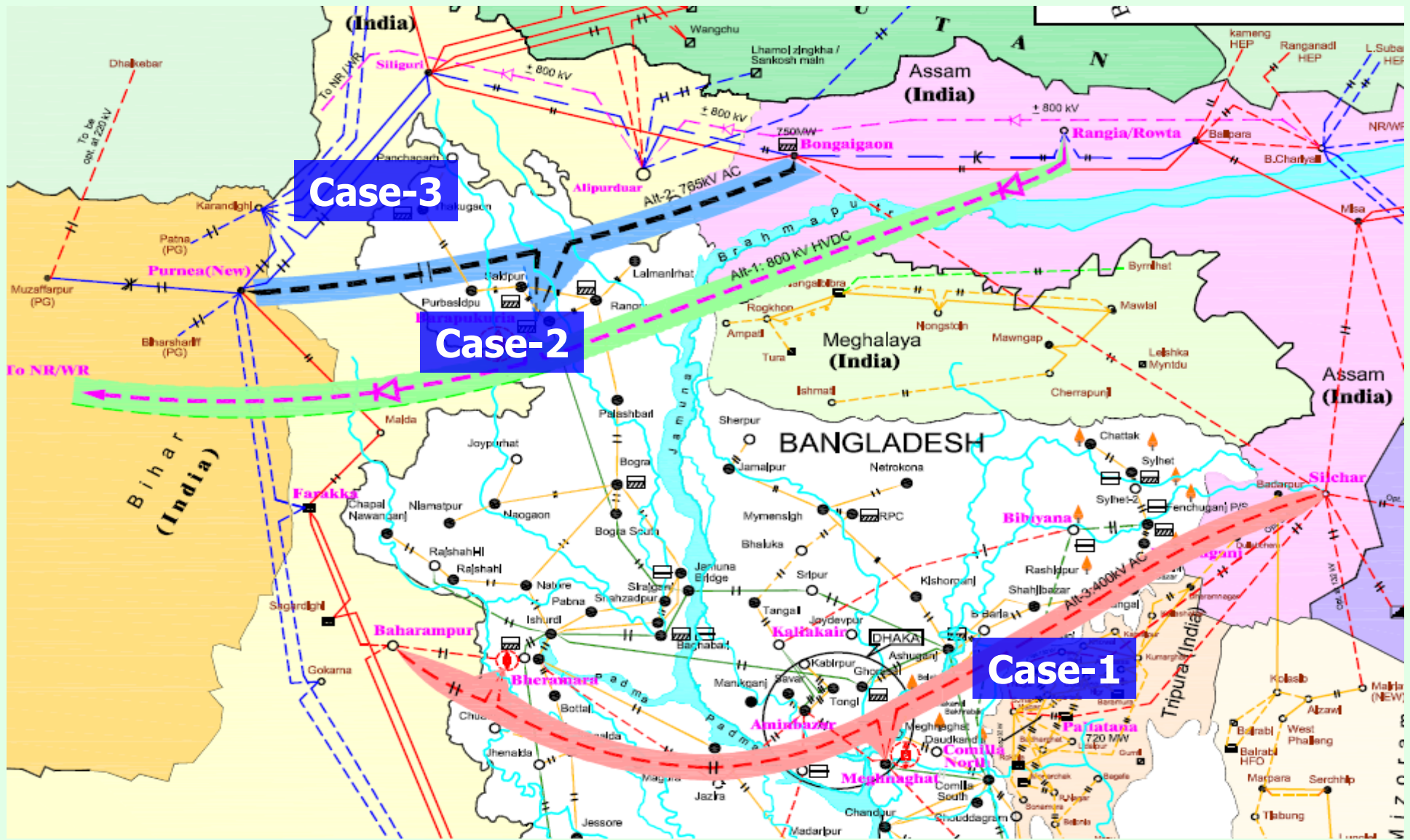
Grid Interconnection Project

Implementation Status:

Back-to-Back HVDC Station at Bheramara:

- **Contract Signed : 29-Mar-2011**
- **Contractor : SIEMENS, Germany**
- **Target of Completion : July, 2013**
- **HVDC station charging: 27th September, 2013**
- **Test power flow: 27th September, 2013**
- **Commercial operation date: 5th October, 2013**

Possible Next Cross Border Interconnections



Expected Benefits

- Diversity of power sources will ensure energy security
- Reduced dependency on liquid fuel based power
- Availability of power at competitive price
- Development of hydro resources in North-Eastern India, Nepal, Bhutan and Power Trade among neighboring countries will bring economic benefits to all the countries.
- Establishment of 'Regional Power Market' is utmost priority for maximizing benefits and ensuring energy security in South Asia

Thank you

Historical Energy Net Generation (GWh) in Bangladesh

