

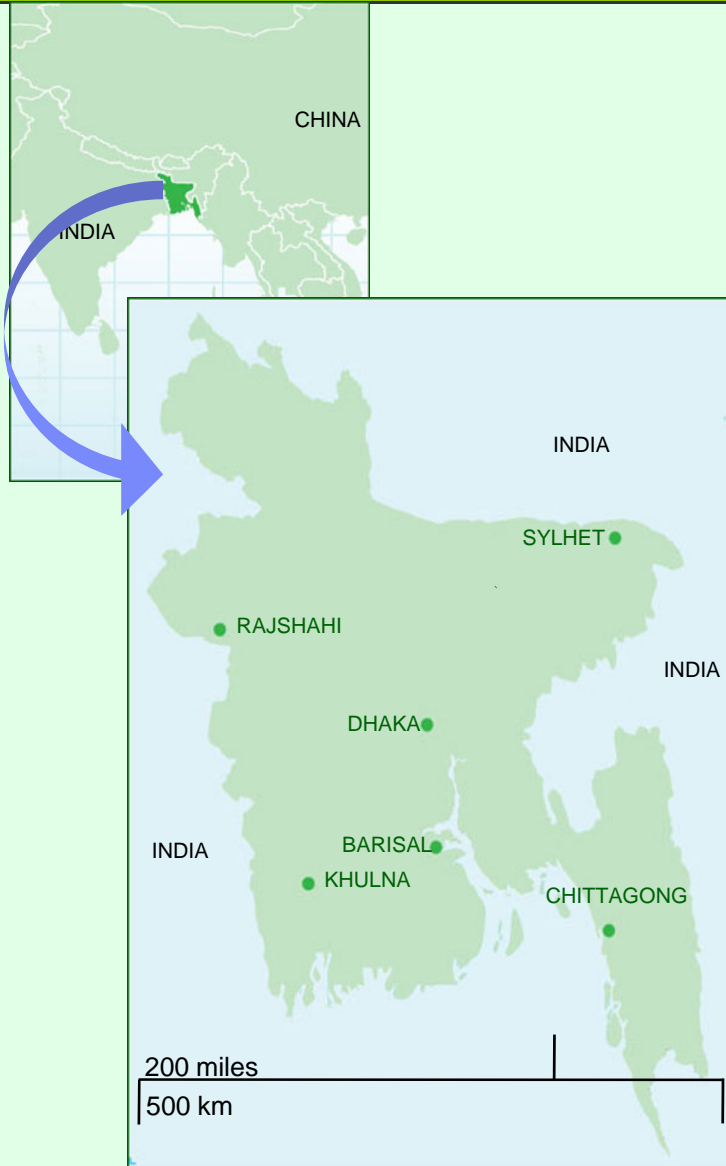
# Bangladesh Perspective on Role of Private Sector Regional Power Trading

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# Bangladesh at a Glance



- **Official Name** : People's Republic of Bangladesh
- **Political System**: Parliamentary Democracy
- **Area** : 147,570 km<sup>2</sup>
- **Population** : 154 million
- **Total Exports** : USD 27 billion (FY2013)
- **Total Imports** : USD 34 billion (FY2013)
- **Remittance** : USD 14.5 billion (FY2013)
- **Forex Reserve** : USD 15 billion
- **GDP total** : USD 130 b (FY 2013)
- **GDP Per Capita** : USD 1040 (FY 2013)
- **Installed Power Capacity**: 9,000 MW

# Present Structure of Power Sector

- *Apex Institution*  
Power Division, Ministry of Power, Energy & Mineral Resources (MPEMR)
- *Regulator*  
Bangladesh Energy Regulatory Commission (BERC)
- *Generation*
  - ◆ Bangladesh Power Development Board (BPDB)
  - ◆ Ashuganj Power Station Company Ltd. (APSCL)
  - ◆ Electricity Generation Company of Bangladesh (EGCB)
  - ◆ North West Power Generation Company Ltd. (NWPGL)
  - ◆ Independent Power Producers (IPPs)
- *Transmission*
  - ◆ Power Grid Company of Bangladesh Ltd (PGCL)
- *Distribution*
  - ◆ Bangladesh Power Development Board (BPDB)
  - ◆ Dhaka Power Distribution Company (DPDC)
  - ◆ Dhaka Electric Supply Company Ltd (DESCO)
  - ◆ West Zone Power Distribution Company (WZPDCL)
  - ◆ Rural Electrification Board (REB) through Rural Co-operatives

# ***Present Power Generation Scenario***

# Bangladesh's Power Sector: At a Glance

- Generation Capacity : 9,000 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 % Renewable Energy)

# Present Generation Capacity (September, 2013)

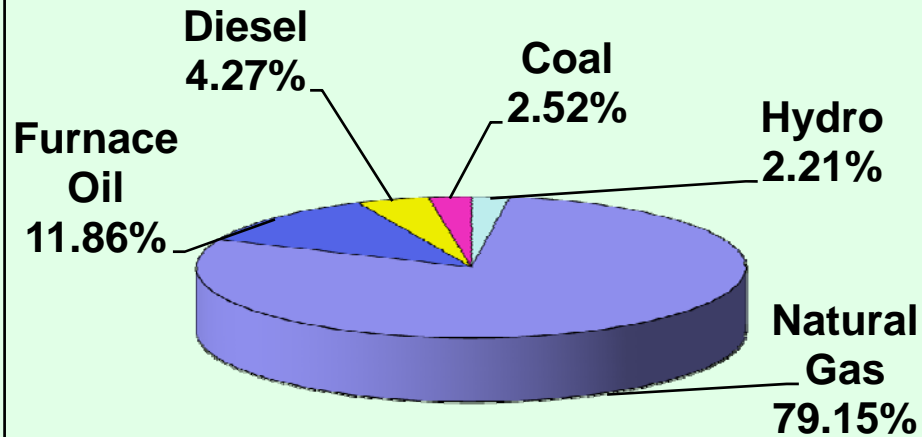
Public Sector		
SL.		Generation Capacity (MW)
1.	BPDB	3700
2.	APSCL	682
3.	EGCB	622
4.	NWPGCL	300
5.	RPCL	77
	<b>Subtotal</b>	<b>5,381 (59%)</b>
Private Sector		
1.	IPPs	1297
2.	SIPPs (BPDB)	99
3.	SIPPs (REB)	226
4.	15 YR. Rental	169
5.	3/5 YR. Rental	1887
	<b>Subtotal</b>	<b>3,678 (41%)</b>
	<b>Total</b>	<b>9,059</b>

# Demand Supply Situation

- Generation: 6,300 – 6,600 MW (Capacity- 9,059 MW)
- Highest so far: 6,675 MW ( July 12, 2013)
- Gas shortage causes 600 - 800 MW less Power Generation
- Peak Demand: 7,000 MW (with DSM)
- Load shedding up to 800-1000 MW during hot summer days (with DSM)
- Shortage and unreliable power supply has constrained economic growth

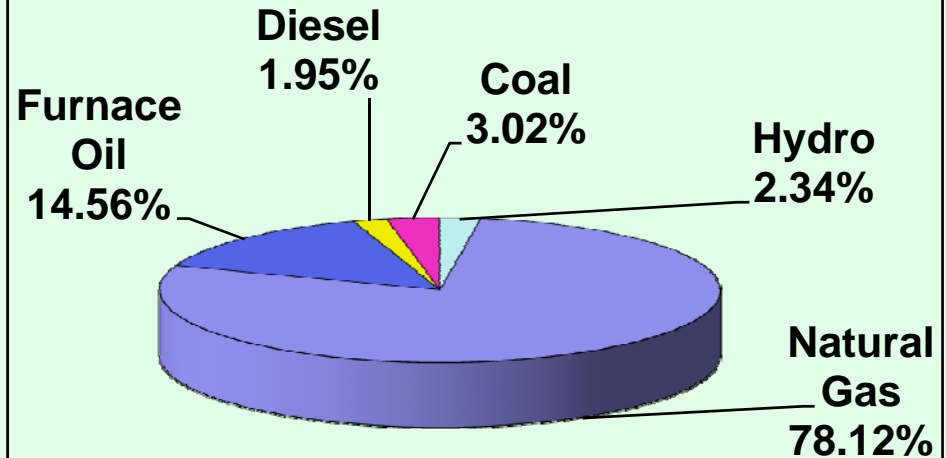
# Energy Generation by Fuel Type

**FY-2012**



**Total Net Generation: 35,118 MkWh**

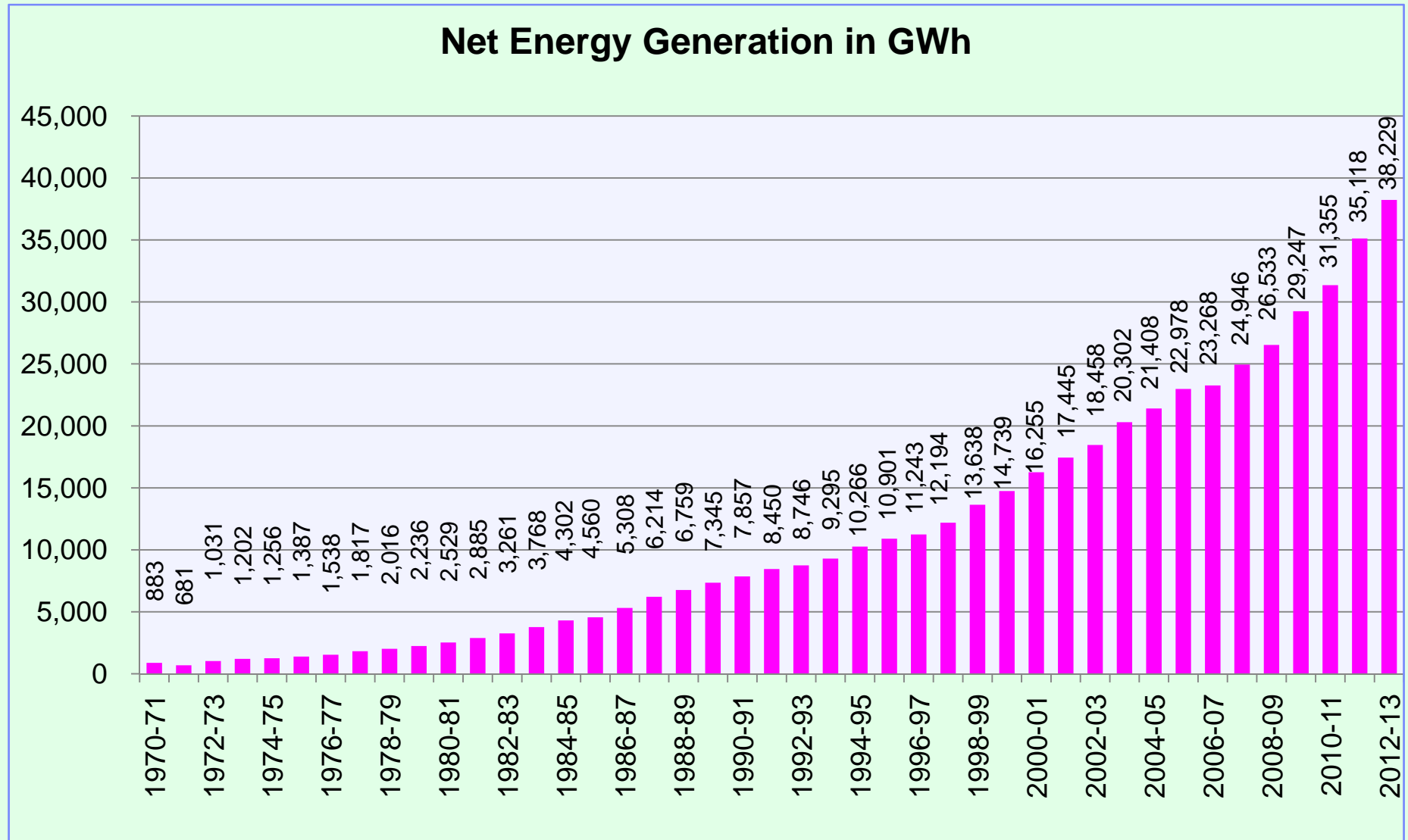
**FY-2013**



**Total Net Generation : 38,229 MkWh**



# Historical Energy Net Generation (GWh) in Bangladesh



# 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

# Access to Electricity

- 70 Million people do not have direct access to grid electricity
- Rest 80 Million are getting unreliable power
- Load shed up to maximum 1000 MW during hot summer days
- Shortage of power supply has constrained economic growth

## **Vision**

- **Provide affordable and reliable electricity for all by 2021**

# 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; Reserve/Production (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; Near term option; Indigenous and Imported; Base Load
- **Renewable:** Present capacity only 100 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 Import for Power Generation
- Nuclear Fuel (back to back)
- Regional Hydro Power Import- Cross Border Trade

# Mid Term Plan for 2013 - 2018

## Calendar Year Wise Projects Completion (From 2013 to 2018)

YEAR	2013 (MW)	2014 (MW)	2015 (MW)	2016 (MW)	2017 (MW)	2018 (MW)	TOTAL (MW)
Public	662	604	1837	1510	00	1320	5933
Private	692	1366	1097	638	1271	00	5064
Power Import	500						500
Total	1854	1970	2934	2138	1271	1320	11,497

Plan: July, 2013

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# ***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



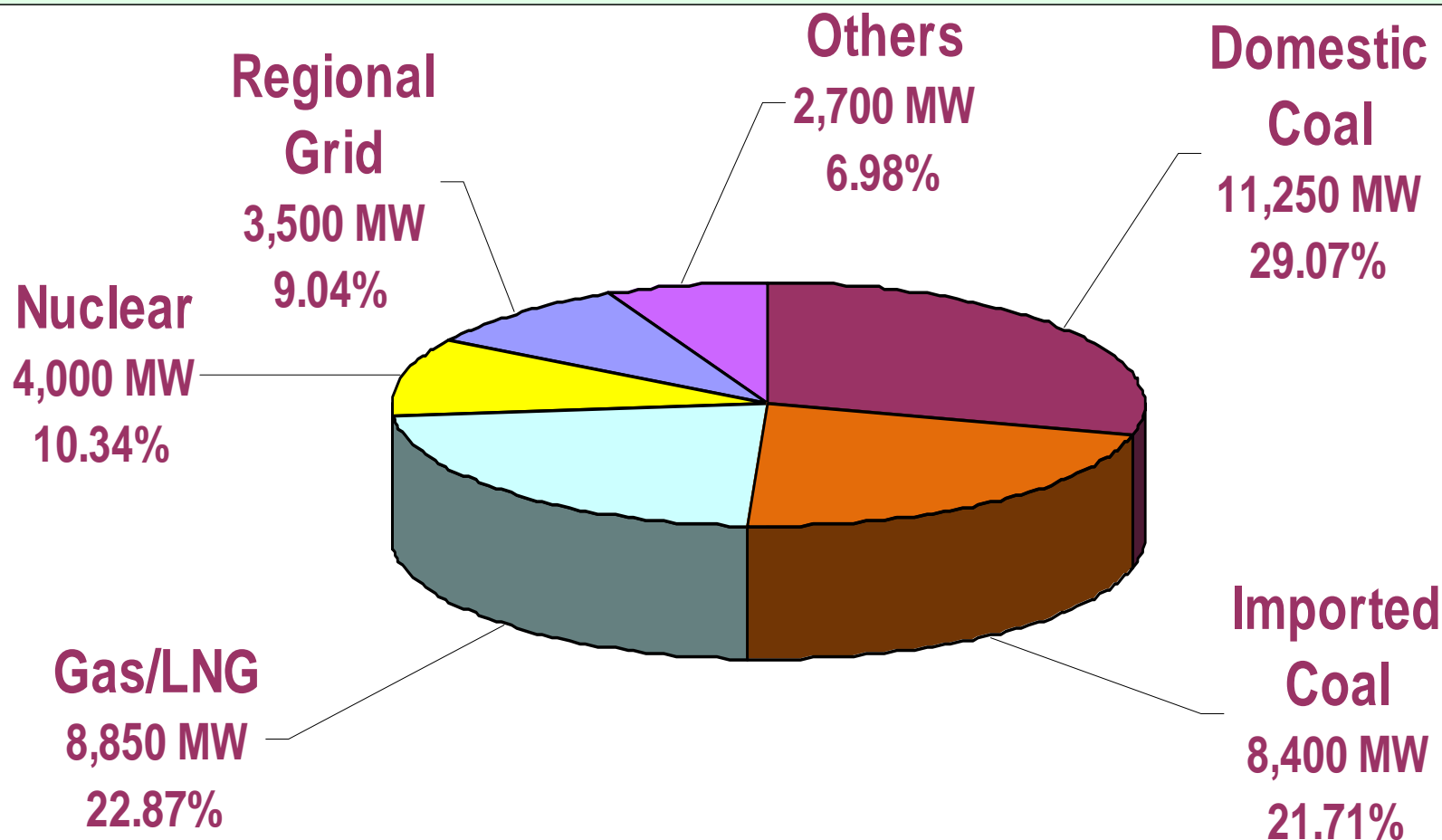
# PSMP Energy Demand Forecast 2030

	Net Generation						
	Total [GWH]	D-Coal [GWH]	I-Coal [GWH]	Gas [GWH]	FO [GWH]	HSD [GWH]	Others [GWH]
2011	35,474	659	0	28,885	3,948	1,564	416
2012	39,467	659	0	29,691	7,383	1,320	416
2013	43,882	659	0	32,037	5,165	1,226	4,796
2014	48,713	2,306	0	36,936	4,369	306	4,796
2015	54,047	2,306	0	42,839	3,801	306	4,796
2016	59,945	2,300	8,081	40,911	3,676	0	4,976
2017	66,457	2,086	19,496	37,734	2,165	0	4,976
2018	73,671	1,652	18,966	35,096	2,165	0	15,791
2019	81,610	9,474	18,539	35,380	2,281	0	15,938
2020	90,950	12,931	16,075	37,122	2,427	0	22,395
2021	99,838	13,443	18,830	38,078	2,574	0	26,911
2022	108,636	17,025	17,883	37,641	2,721	0	33,363
2023	118,485	20,407	17,992	35,078	2,867	0	42,140
2024	127,368	25,722	17,016	33,459	2,867	0	48,304
2025	137,964	26,453	17,885	33,459	3,028	0	57,141
2026	147,245	30,166	23,577	33,151	3,192	0	57,158
2027	158,456	37,319	28,891	31,401	3,347	0	57,499
2028	167,938	48,404	28,456	30,162	3,378	0	57,538
2029	180,089	60,352	31,473	27,053	3,604	0	57,608
2030	190,752	66,286	35,130	28,653	3,076	0	57,608

# 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		Dhaka, Chittagong and Khulna
3	Domestic Gas/LNG	8,850	23	Gas- Near Load Centers LNG- Near Costal Area
4	Regional Grid	3,500	9	Bharrampur - 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		

# Probable Power Generation: Primary Fuel Sources by 2030



**Total Generation Capacity in 2030: 38,700 MW**

# 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)**

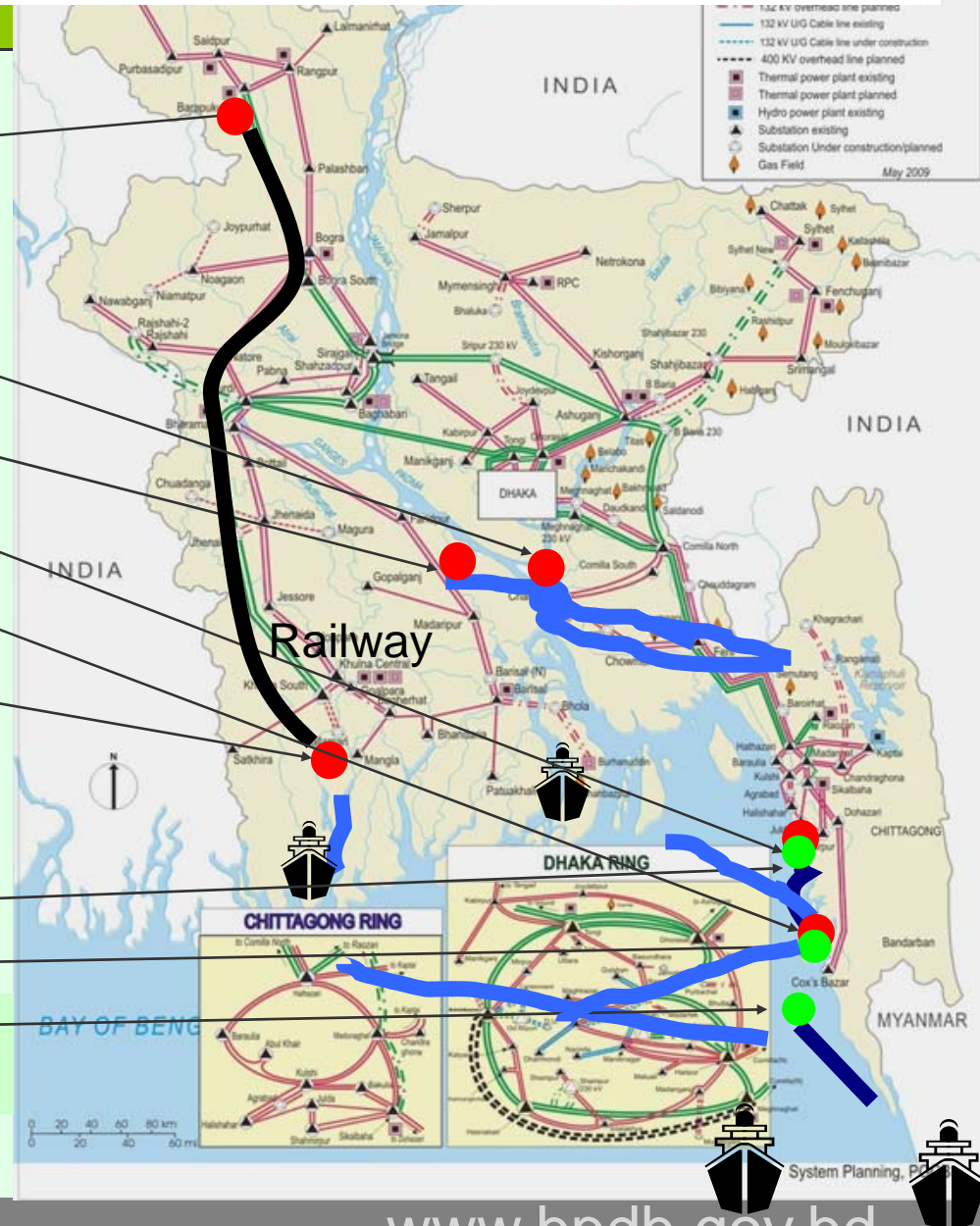
## Coal Center

Chittagong

Matarbari

Moheshkhali Island

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



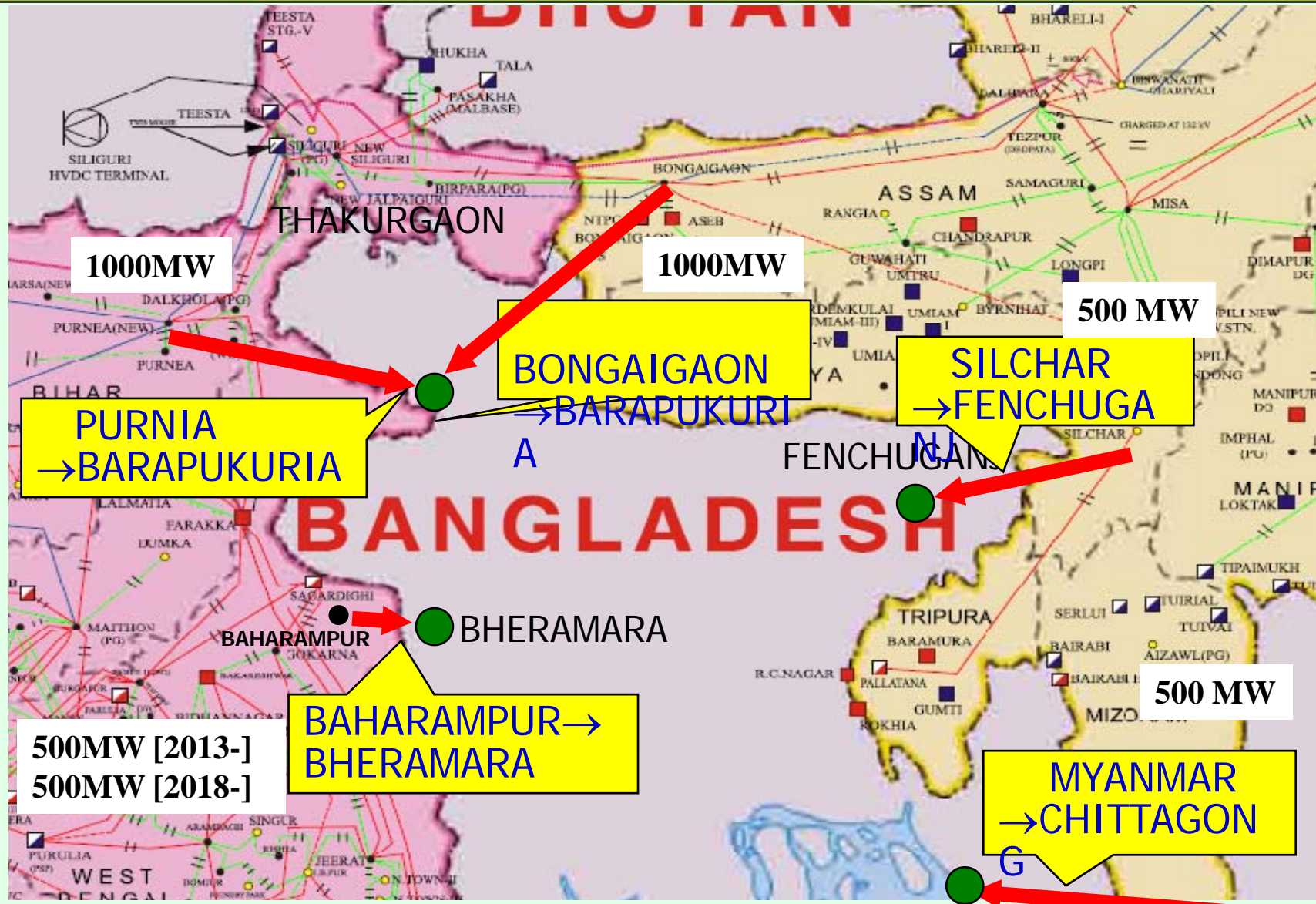
# Nuclear Power Plant : Inter Governmental Agreement (IGA)

Signed between Bangladesh and Russia Federation on 02 Nov

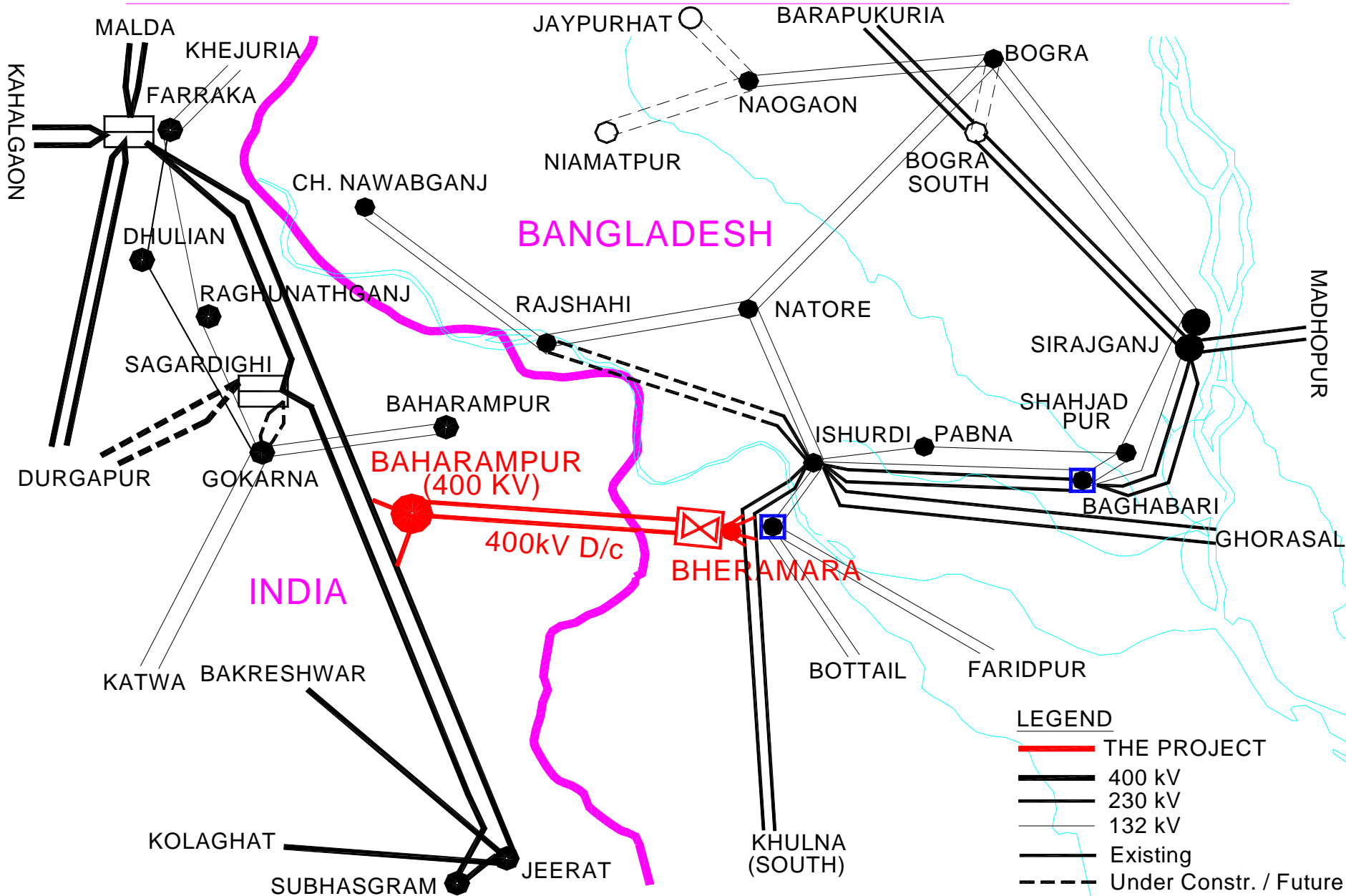
- Supply, installation, commissioning and operation of the Ruppur Nuclear Power Plant with 2 units of 1000 MWe.
- Cooperate to build up infrastructures including Regulatory infrastructures
- Financing
- Supply of fuel for the whole operational life of the reactors
- Take-back of Spent Fuel
- Development of HRD both for operation and regulation of RNPP



# Regional Power Exchange: Possibilities



# INTERCONNECTION BETWEEN INDIA AND BANGLADESH GRIDS



# Power Purchase from India

- ❑ Power Purchase Agreement has been signed between BPDB and NVVN to purchase 250 MW power from India.
- ❑ Term of the PPA is 25 years.
- ❑ Power will flow through Bohrompur Substation, India to Bheramara Substation, Bangladesh.
- ❑ Power will flow through 400 KV line.
- ❑ Power flow will start from October 05, 2013



# Power Purchase from India

- ❑ Power Purchase Agreement will be signed very soon between BPDB and PTC India Limited to purchase 250 MW power on short term basis.
- ❑ Term of the PPA is 3 years.
- ❑ Power will flow through Bohrompur Substation, India to Bheramara Substation, Bangladesh.
- ❑ Power will flow through 400 KV line.

# Bangladesh – India / Nepal / Bhutan Co-operation

## □ Potential Regional Energy Co-operation under Considerations

- ✓ Bangladesh-India-Nepal Joint Venture Investment in Hydro Power Project in Eastern part of Nepal
- ✓ Import power from Nepal to Bangladesh through Indian territory providing wheeling charge to eastern regional grid of India
- ✓ Power Trade from Bhutan to Bangladesh with a tripartite agreement with India and Bhutan

**Thank you**