An Overview of Power Sector of Bangladesh

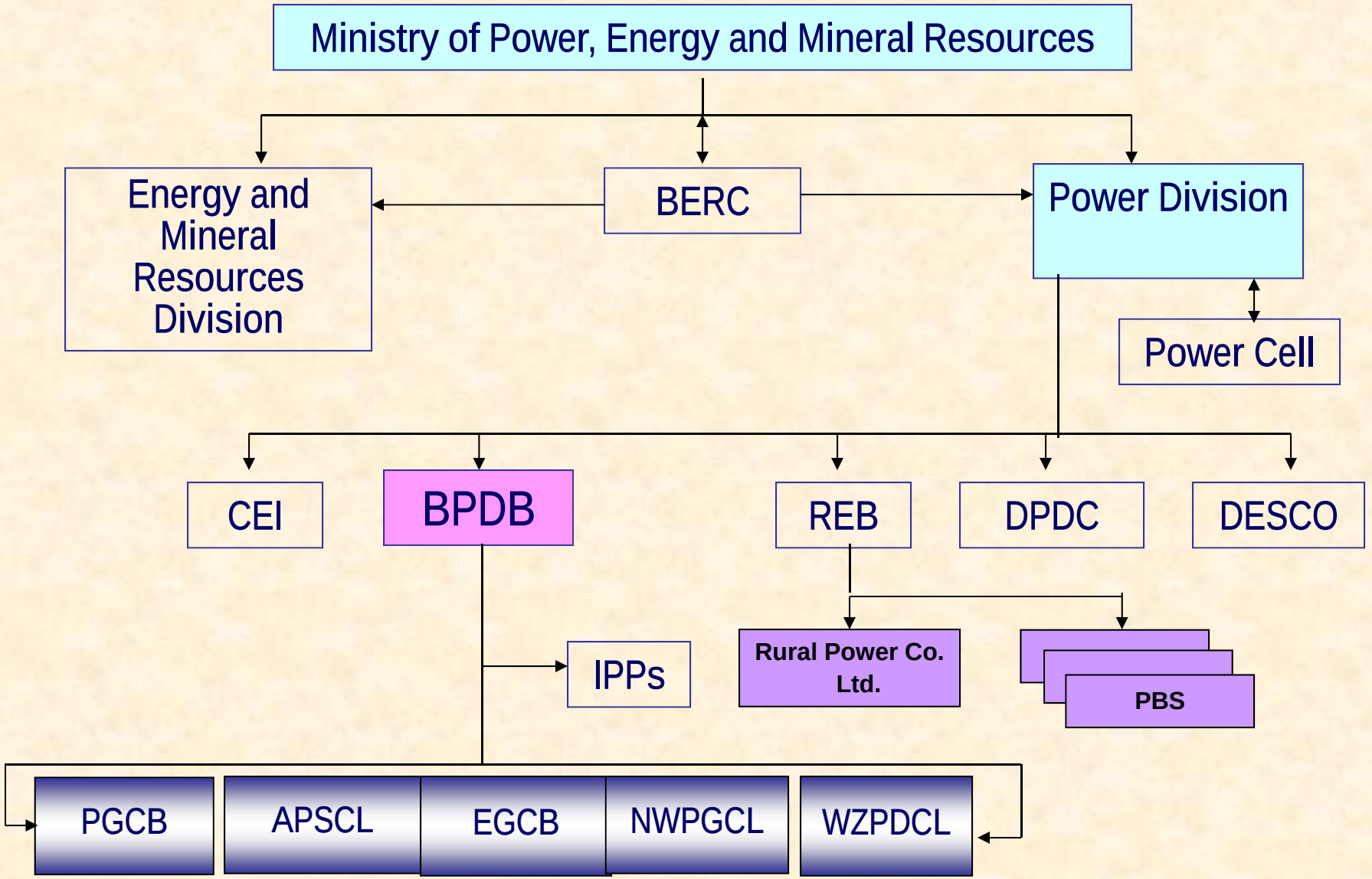
November, 2011

Bangladesh Power Development Board

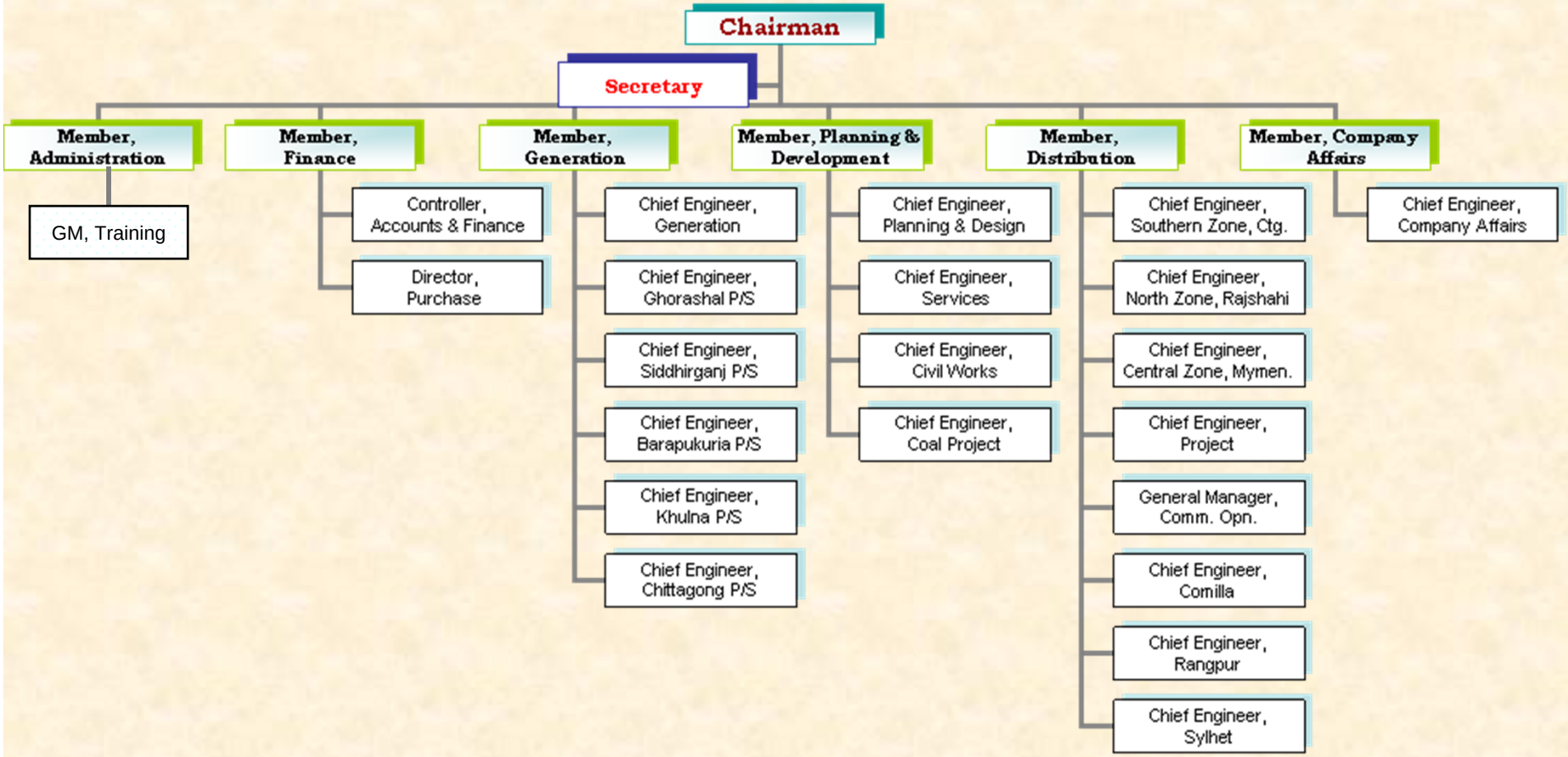
Present Structure of Power Sector

- *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. (NWPGCL)
  - Independent Power Producers (IPPs)
- *Transmission*
  - Power Grid Company of Bangladesh Ltd (PGCB)
- *Distribution*
  - Bangladesh Power Development Board (BPDB)
  - Dhaka Power Distribution Company (DPDC)
  - Dhaka Electric Supply Company Ltd (DESCO)
  - West Zone Power Distribution Company (WZPDC)
  - Rural Electrification Board (REB) through Rural Co-operatives

Present Structure of Power Sector



BPDB Management

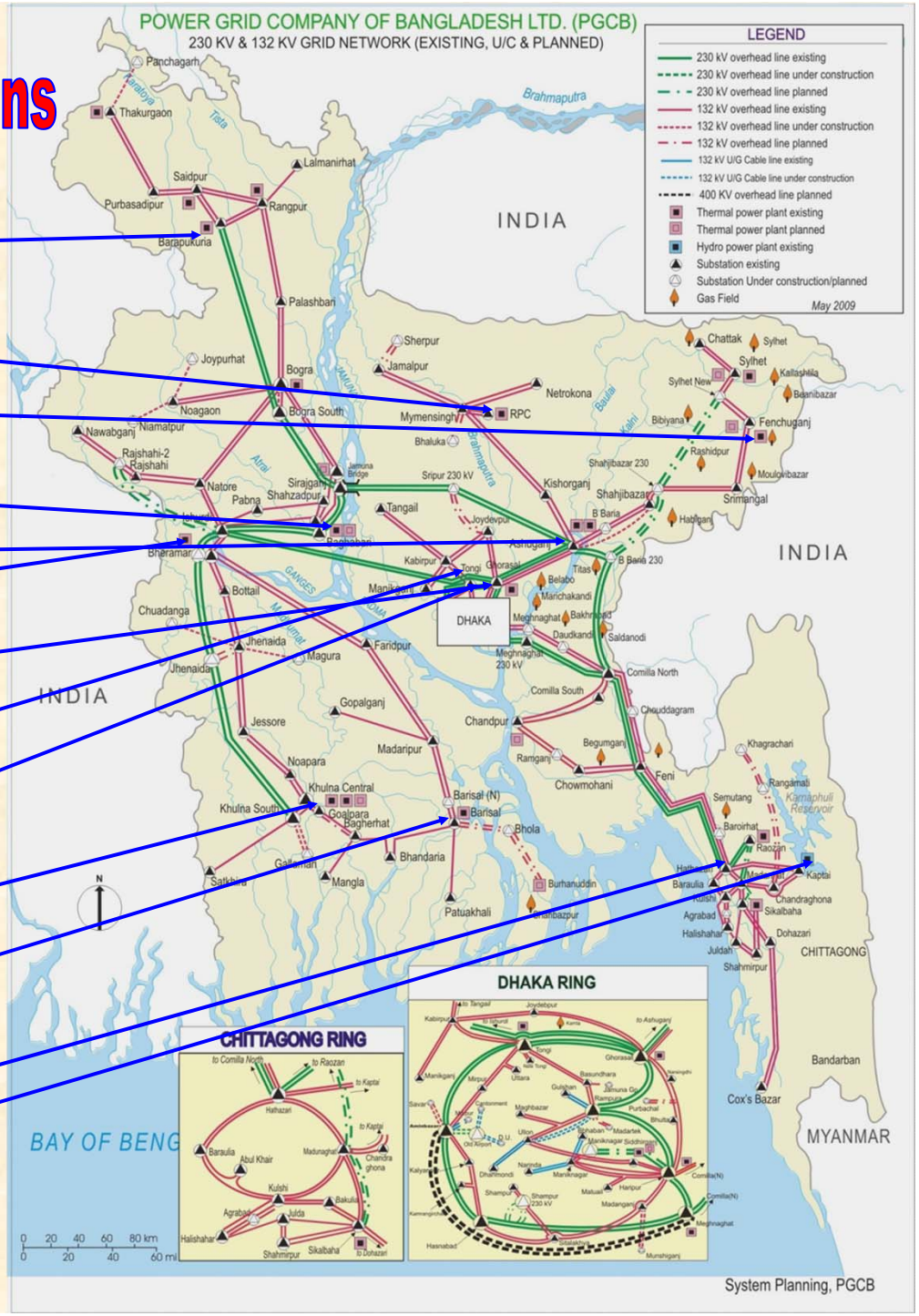


Functions of BPDB

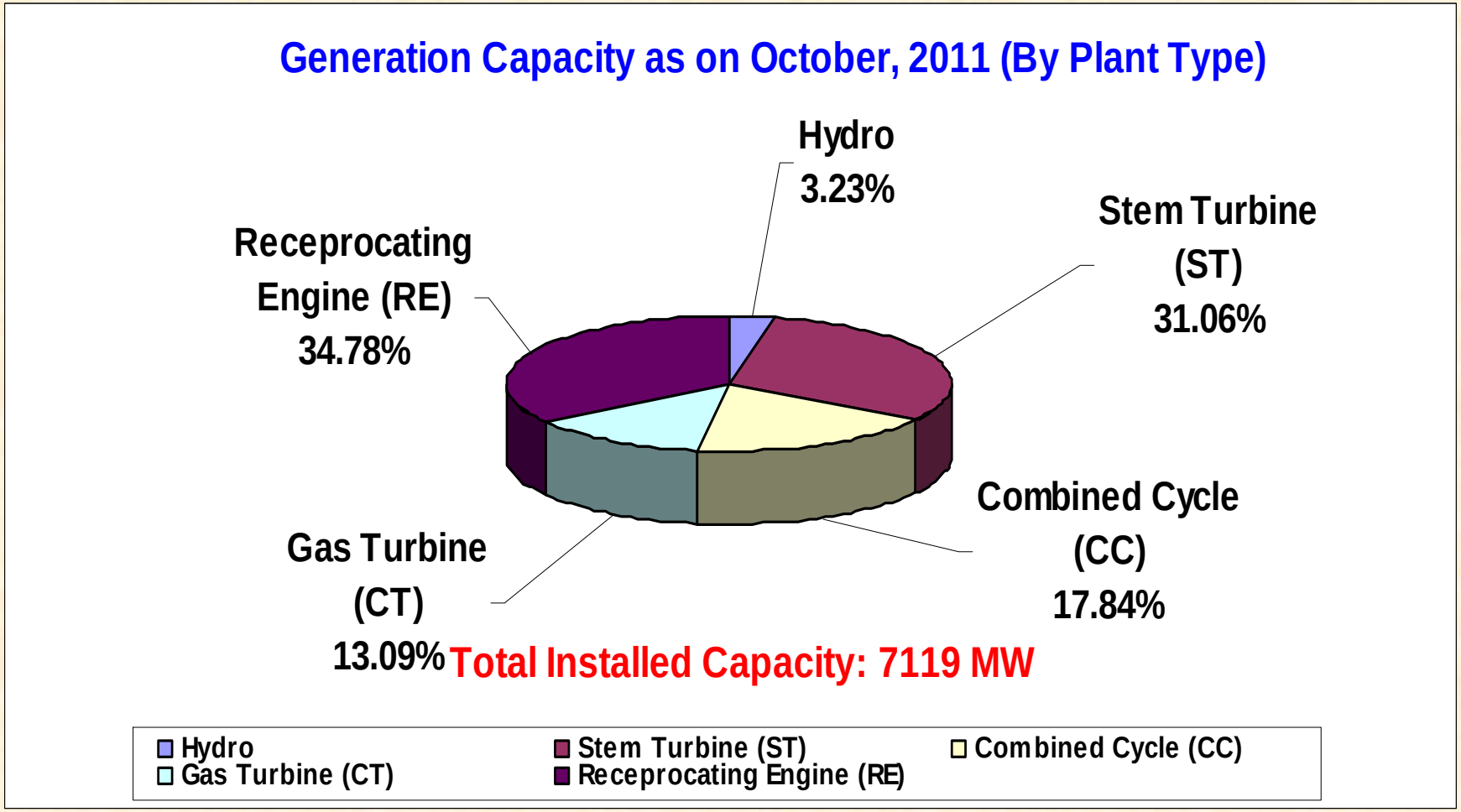
- Partially integrated public utility
- Generates power
- Purchaser & seller of power as a “Single Buyer”
  - Prepare least cost generation expansion plan
  - Construct most of public sector power plants according to least cost plan
  - Conduct procurement process for Private Power (IPPs)
  - Purchase electricity from generators (public and private)
  - Sell to distributors
- Distribution business in nation-wide urban areas, except Dhaka and West Zone

Existing Major Generating Stations

- **Barapukuria - 250 MW**
- **Mymensingh - 210 MW**
- **Shahjibazar & Fenchuganj- 300 MW**
- **Baghabari - 261 MW**
- **Ashuganj - 724 MW**
- **Bheramara - 60 MW**
- **Ghorasal - 950 MW**
- **Tongi - 105 MW**
- **Meghna, Haripur & Siddirganj- 1300 MW**
- **Khulna - 270 MW**
- **Barisal - 40 MW**
- **Raujan & Sikolbaha - 600 MW**
- **Kaptai - 230 MW**



Generation Capacity: By Plant Type



Present Power Scenario

Bangladesh's Power Sector: At a Glance (FY 2011)

- Electricity Growth : 7.20 % in FY-2011 (Av. 7 % since 1990)
- Generation Capacity : 7119 MW (Oct., 2011)
- Total Consumers : 12.5 Million
- Transmission Lines : 8,600 km
- Distribution Lines : 2,78,000 km
- Per Capita Generation : 252 kWh (incl. Captive)
- Access to Electricity : 50 %

Present Generation Capacity (Oct., 2011)

Public Sector		
SL.		Generation Capacity (MW)
1.	BPDB	2868
2.	APSCL	659
3.	EGCB	255
	Subtotal	*3782 (53 %)*
Private Sector		
1.	IPPs	1231
2.	SIPPs (BPDB)	99
3.	SIPPs (REB)	226
4.	15 YR. Rental	168
5.	3/5 YR. Rental	1613
	Subtotal	*3337 (47 %)*
	Total	**7119**

- **Considering 15-20 % Maintenance and Forced Outage, Available Generation Capacity is in the range of 5600 – 5800 MW without fuel constraint**

Demand Supply Situation

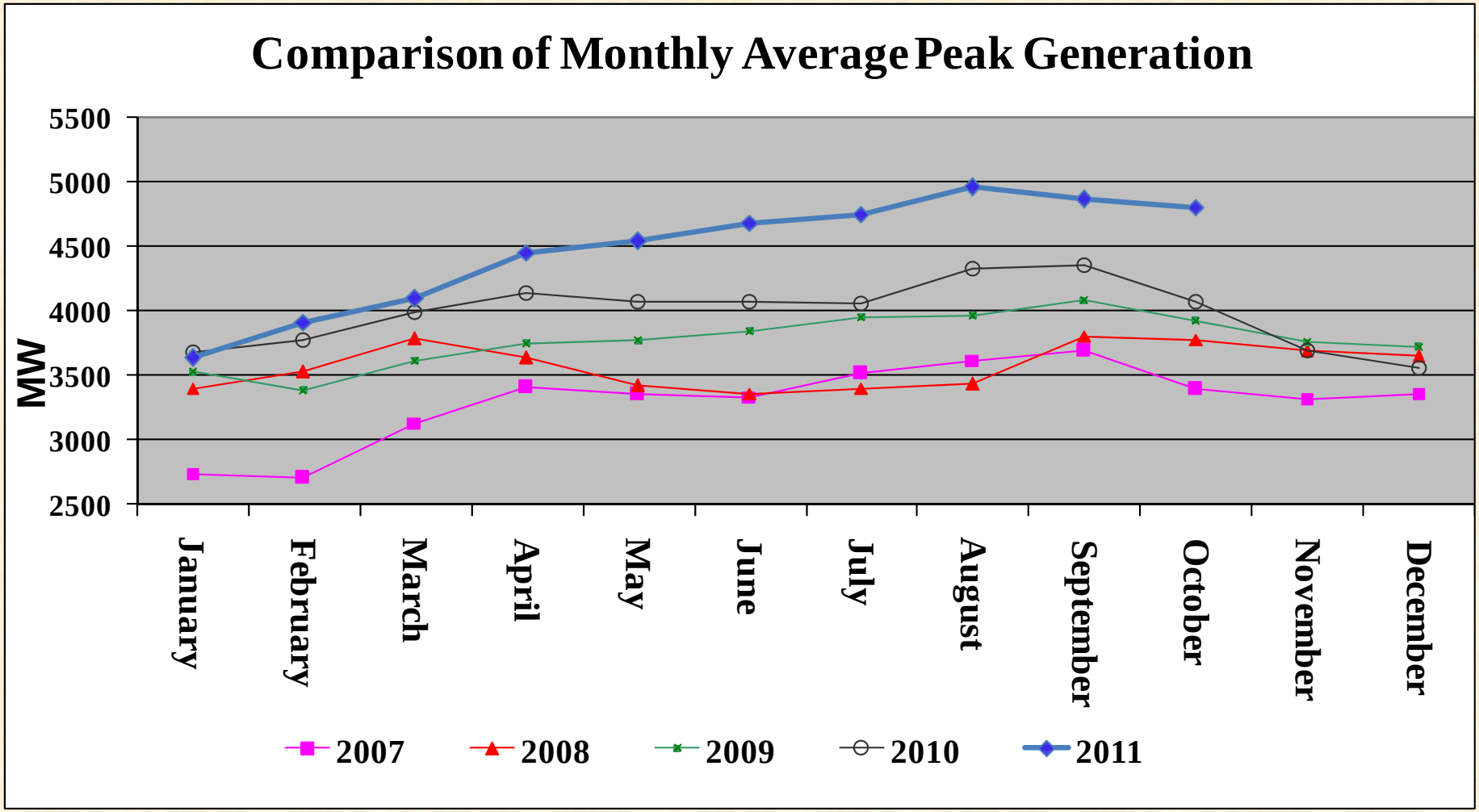
- Generation: 5000 – 5300 MW (Capacity- 7119 MW)
- Highest so far: 5244 MW (August 29, 2011)
- Gas shortage causes 400 - 600 MW less Power Generation
- Peak Demand: 6000 MW (with DSM)
- Load shedding up to 800 MW during hot summer days (with DSM)
- Shortage and unreliable power supply has constrained economic growth

Age of Power Plants

Age Group (Years)	Generation Capacity (MW)
40 +	208
31 – 40	156
21 – 30	1268
11 – 20	1412
01 – 10	4075
Total	7119

- **23 % of Capacity have more than 20 Years life**

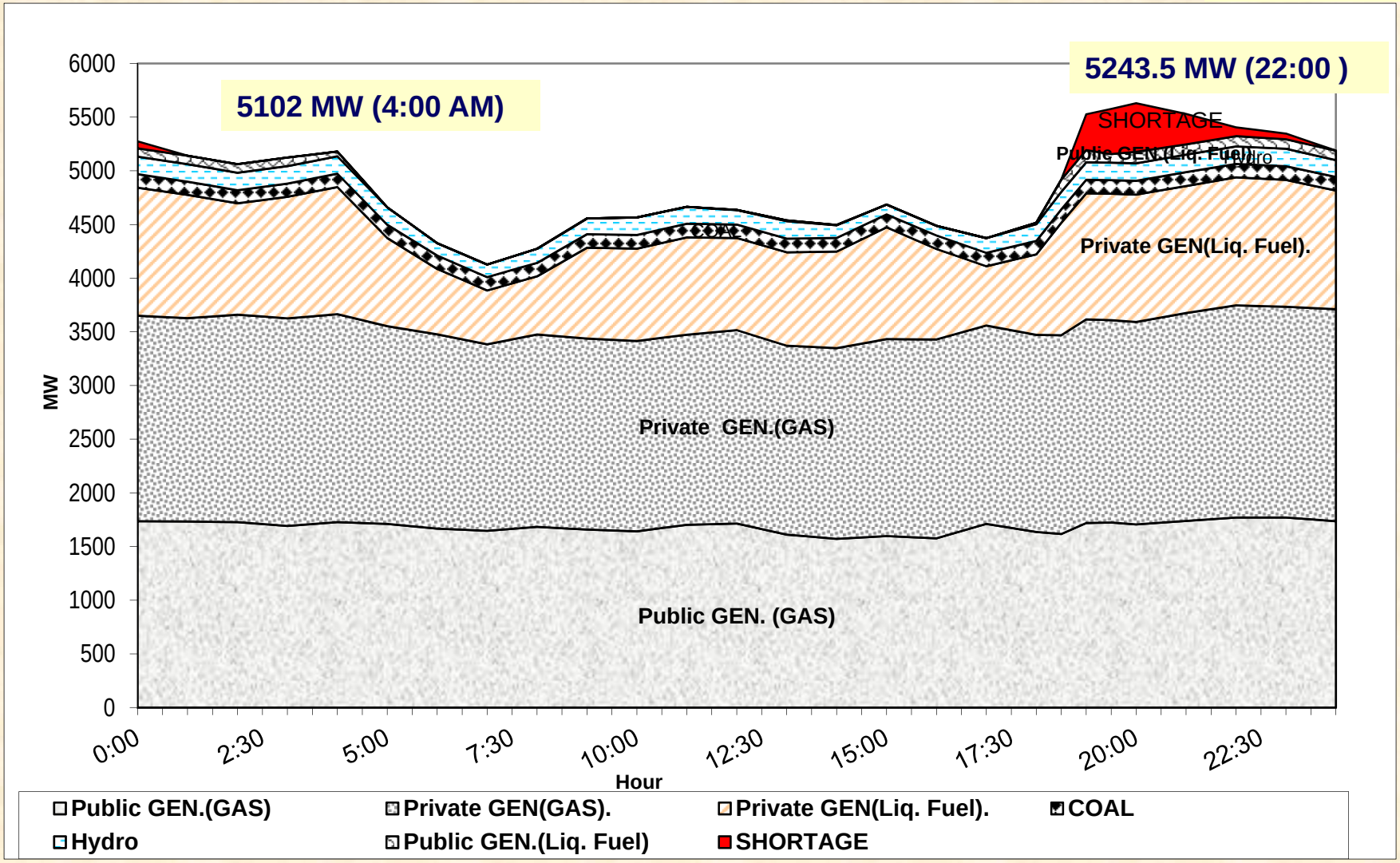
Average Peak Power Generation



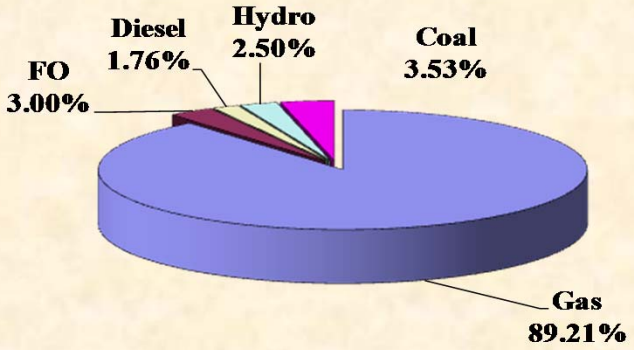
- Av. Peak Power Generation in August' 2011 : 4956 MW
- Av. Peak Power Generation in October' 2011 : 4804 MW

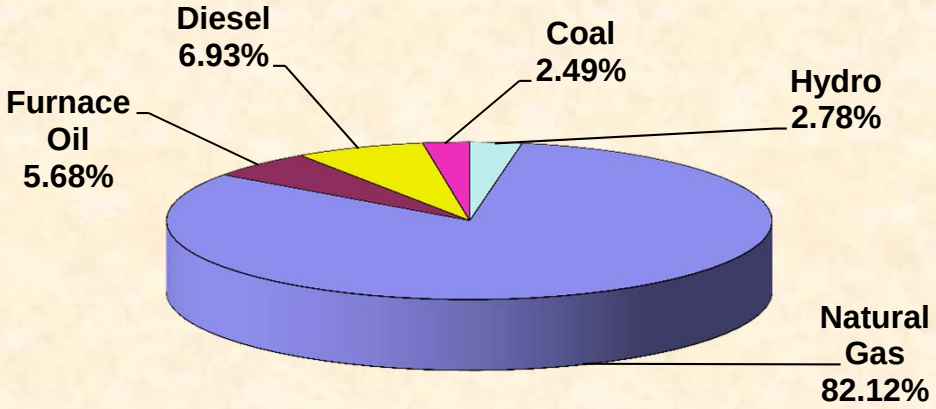
Load Curve on August 29, 2011 (so far Maximum Peak)

Holiday



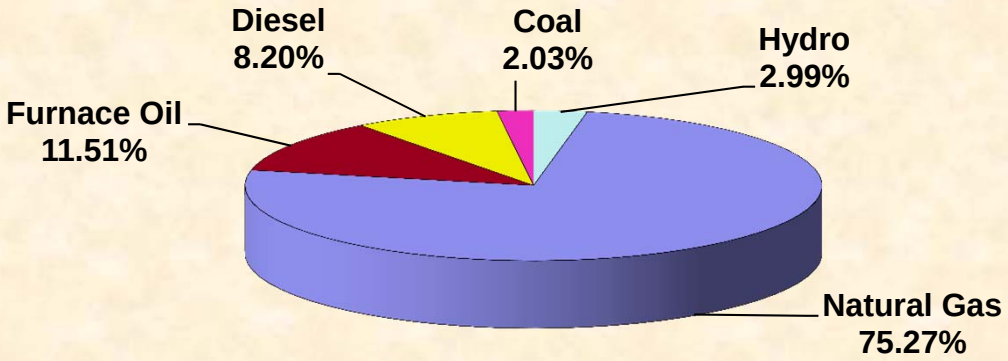
Energy Generation by Fuel Type in FY 2010 and FY 2011





Energy Generation(FY10): 29,247 M kWh

Energy Generation (FY 11): 31,355 M kWh



Energy Generation(July-11 To Sept. 11): 9,293 M kWh

- **Energy Growth in FY11 is about 7.20 %**
- **High Dependence on Gas**

Planning Perspective

Primary Fuel Supply Scenario

- Gas: No significant gas discovery in recent years; off – shore and on – shore gas exploration initiatives & increased reserves in present fields may change the present scenario
- Coal: Near term option; Indigenous or Imported; Base Load;
- Oil: Volatile market; High price; For peaking duty
- LNG: Necessary to ensure secure and reliable gas supply
- Nuclear: Safe technology; No pollution; Expected to be future Base Load option

Power Generation Projects up to 2016

Calendar Year Wise Projects Completion (From 2010 to 2016)

YEAR	2010 (MW) Commissioned	2011 (MW)	2012 (MW)	2013 (MW)	2014 (MW)	2015 (MW)	2016 (MW)	TOTAL (MW)
Public	*255*	*851*	*838*	*1190*	*1270*	*450*	*1500*	*6204*
Private	*520*	*1343*	*1319*	*1034*	*1003*	*1900*	*1300*	*8569*
Total	**775**	**2194**	**2157**	**2224**	**2273**	**2350**	**2800**	**14,773**

- **Public Sector : 6204 MW (comm: 587 MW, u/c: 1731 MW, Tender: 1275 MW); (42%)**
- **Private Sector : 8569 MW (comm:1463 MW, u/c: 1667 MW, Tender: 2639 MW); (58%)**

Estimated Demand Supply Gap up to 2015 (Fiscal Year)

Fiscal Year	2010	2011	2012	2013	2014	2015	2016
Max.Demand with DSM	6454	6765	7518	8349	9268	10283	11405
Gen addition - Public Sector		308	1211	865	1510	810	1500
Gen. addition - Private Sector		1348	477	2811	823	1600	1900
Capacity Retired		40	98	33	1058	426	1033
Generation Capacity	5271	6887	8477	12120	13395	15379	17746
NET	5060	6612	8138	11635	12859	14764	17036
Dependable Capacity	3846	5091	6348	9192	10287	11811	13629
Shortfall	-2608	-1674	-1170	843	1019	1528	2224
	-40%	-25%	-16%	10%	11%	15%	19%

Project Implementation

Successful Contract Signed since Jan 2009

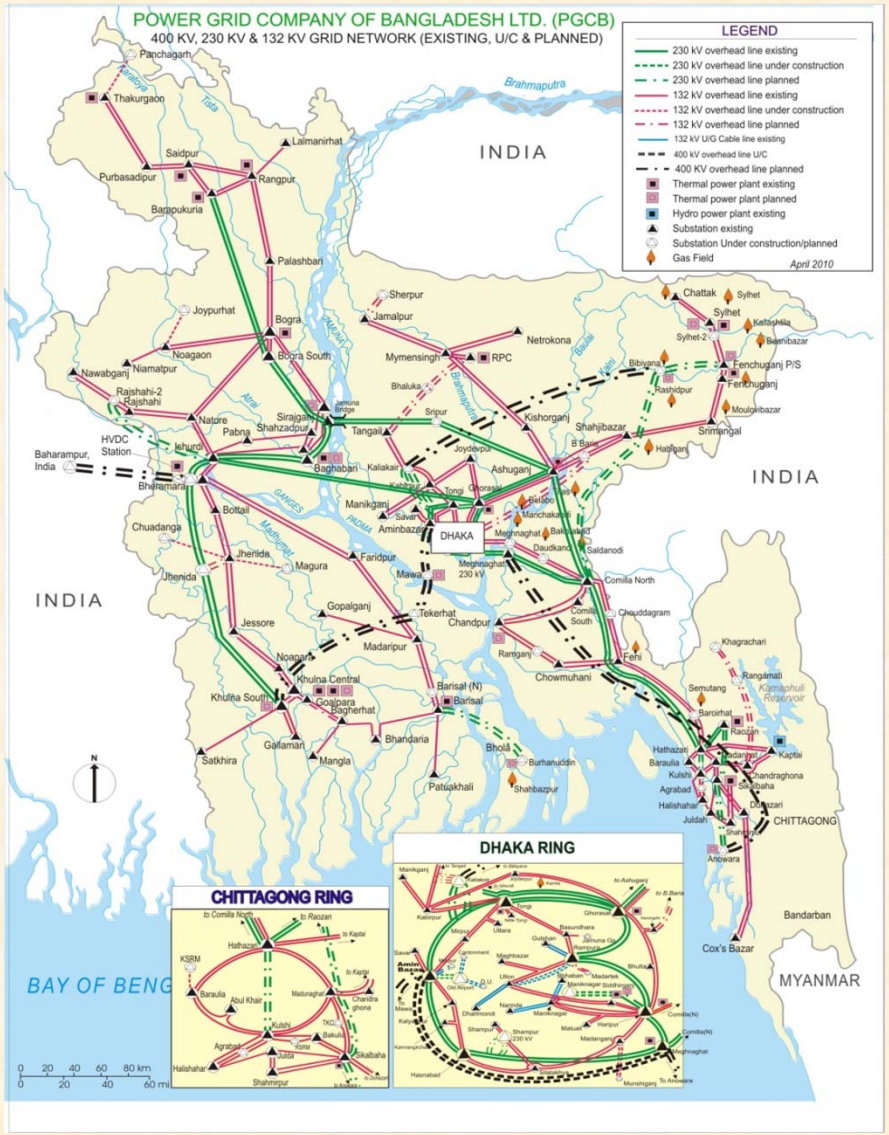
Sl. No.	Description	No. of Contract	No. of Plant	Capacity (MW)	Commis. (MW)
01.	Private Sector	27	29	3236	1353
02.	Public Sector	18	18	2011	228
	Total	**45**	**47**	**5,247**	**1581**

- Out of 5247 MW, 1581 MW (20 Plants) already commissioned.
- 27 Projects with capacity 3666 MW under construction.

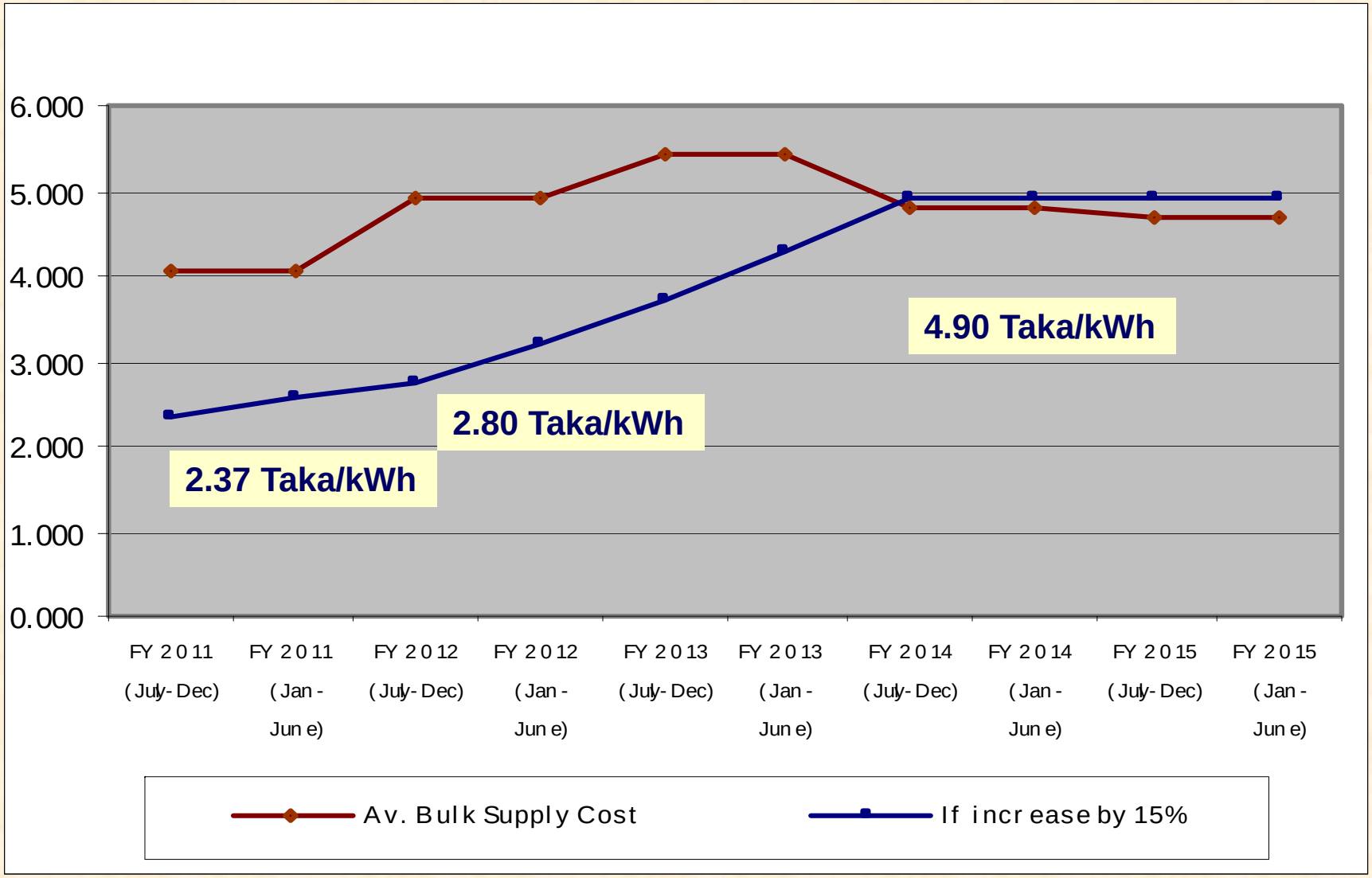
Projects Under Tendering Process: Contract within Next 6 Months

Sl. No.	Description	No. of Projects	Capacity (MW)
01.	Public Sector	6	1600
02.	Private Sector (IPP's)	22	2977
	Total	**28**	**4,577**

Bangladesh Transmission Network



Average Supply Cost and Bulk Tariff Requirement



Power System Master Plan up to 2030

Power System Master Plan (up to 2030)

- Updates of PSMP 2006: Due to change of planning perspective
- PSMP 2010 : Long term planning up to 2030
- Study completion: February 2011
- Findings:

  - Generation capacity requirement by 2021: 24,000 MW
  - Generation capacity requirement by 2030: 39,000 MW
  - Coal based generation capacity by 2030: 20,000 MW
  - Coal and Nuclear for base load power requirement
  - Cross Boarder Trade with neighboring countries

Probable Power Generation: Primary Fuel Sources by 2030

Sl. No.	Description	Capacity (MW)	Probable Location (s)
1	Domestic Coal	11,250	North West Region at Mine Mouth
2	Imported Coal	8,400	Chittagong and Khulna
3	Domestic Gas/LNG	8,850	Near Load Centers
4	Nuclear	4,000	Ruppur
5	Regional Grid	3,500	Bahrampur - Bheramara, Agartola - Comilla, Silchar - Fenchuganj, Purnia-Bogra, Myanmar - Chittagong
6	Others (Oil, Hydro and Renewable)	2,700	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)

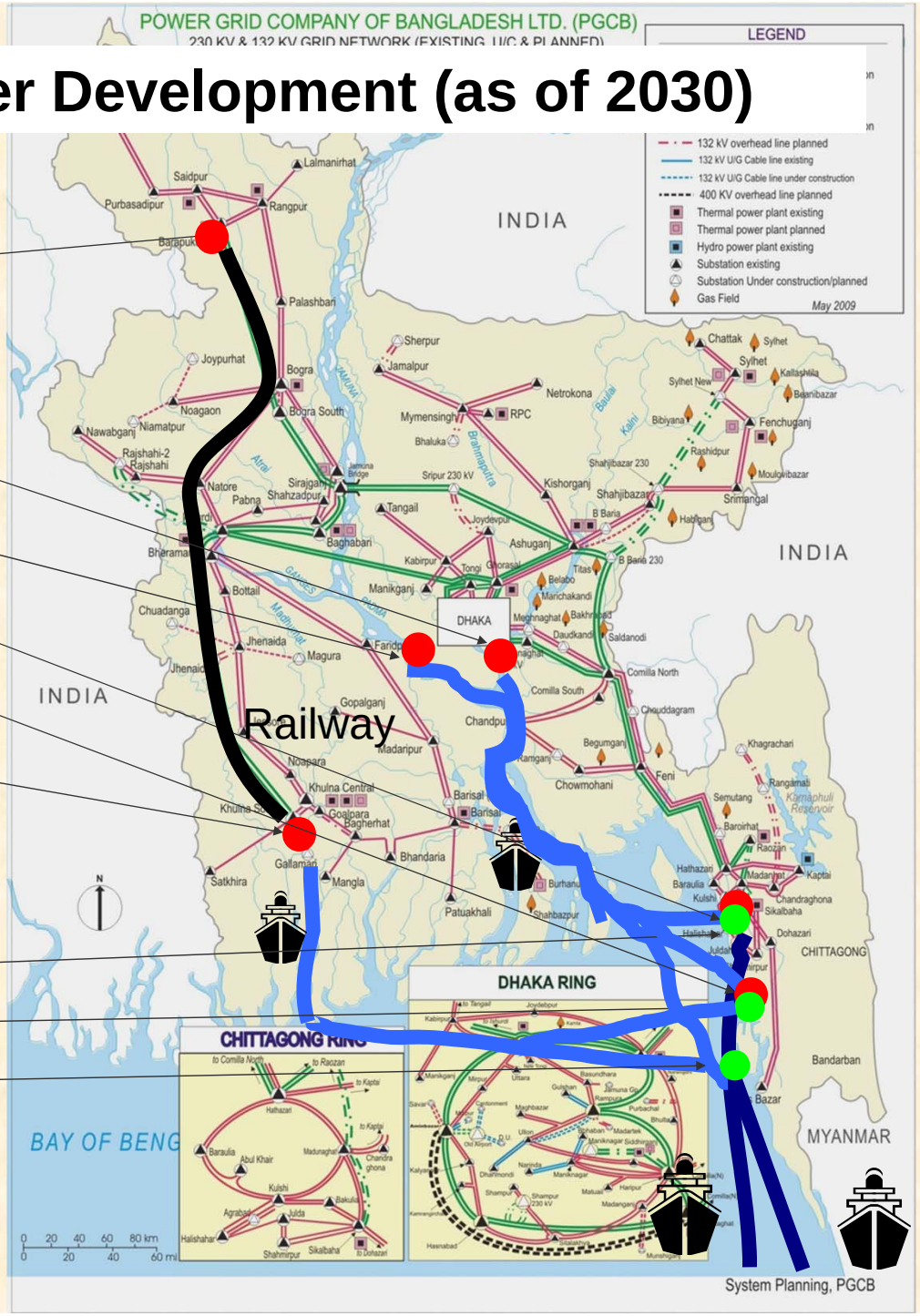
Coal Center

Chittagong

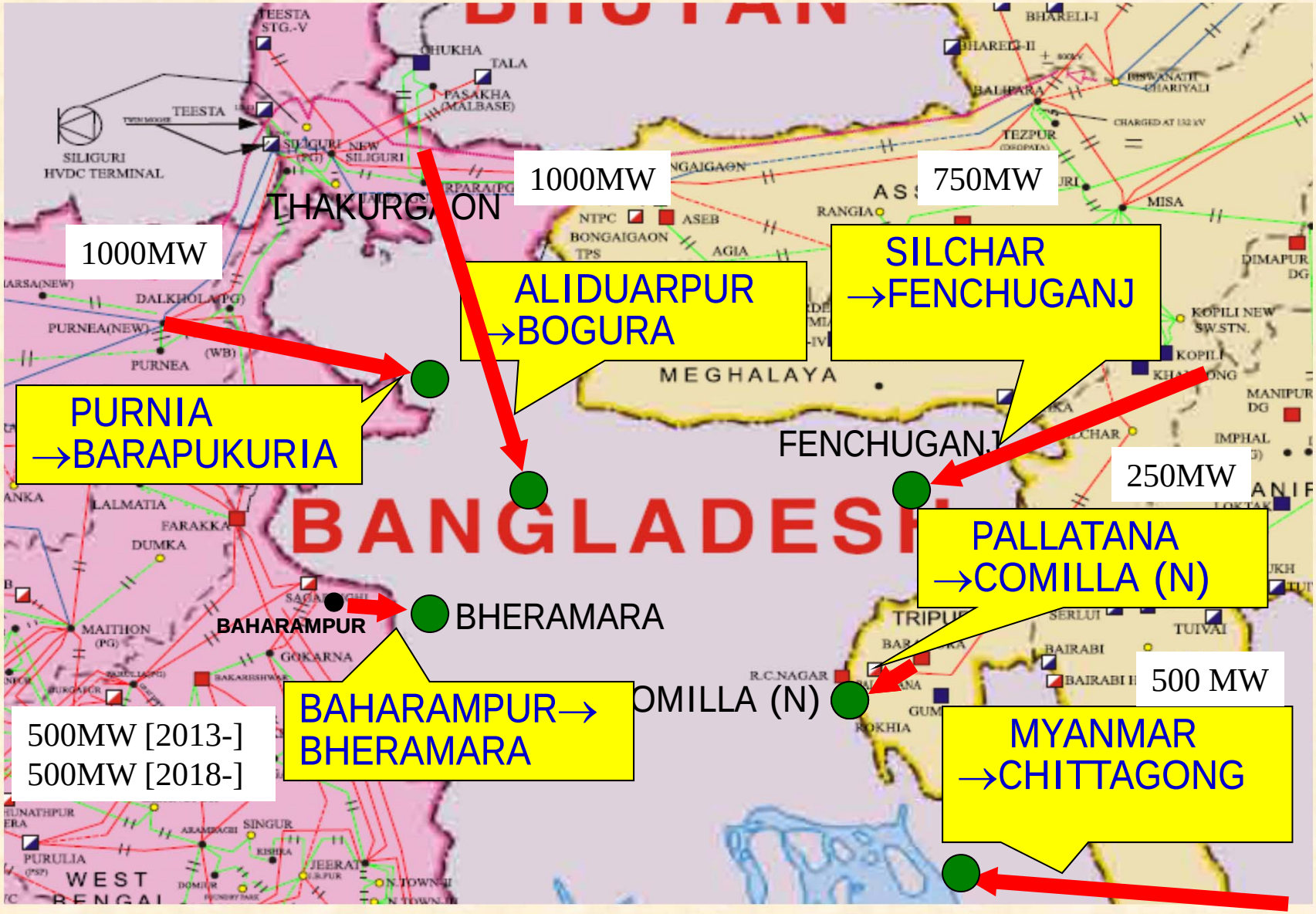
Matarbari

Sonadia Island

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



Regional Power Exchange: Possibilities



Challenges

Primary Fuel Supply

- Enhanced Gas Exploration, Production
- Domestic coal development
- Coal Import (long term contract) and deep sea port for coal handling
- LNG import
- Safe Nuclear Technology

Project Financing

- Ensuring financing for Public and Private sector projects
- Availability of foreign currency

Transportation of fuel and equipment

- Infrastructure development by Railway and R&H
- Dredging of river routes by BIWTA
- Capacity build up of BPC, Railway, R&H and BIWTA etc.

Human Resources Development

- Development of skilled manpower: adopt and operate new technology

Thank You

Barapukuria 2x125 MW Coal fired Power Plant

Siddhirganj 210 MW Thermal Power Plant (Unit-2)

Kaptai 230 MW Hydro Power Plant

Kutubdia 1MW Wind Park

East West Inter-Connector