

## 付 属 資 料

1. 要請書
2. 質問票
3. 合意したS/W、M/M
4. 面談議事録



## APPLICATION FORM FOR JAPAN'S DEVELOPMENT STUDY PROGRAM

Date of entry: month July year 2007

Applicant: the Government of People's Republic of Bangladesh

### 1. Project digest

(1) Project Title: Master Plan Study on Coal Power Development in Bangladesh

(2) Location (province/county name): Whole Area of Bangladesh

(3) Implementing Agency

Name of the Agency: Bangladesh Power Development Board (BPDB)  
/ Chief Engineer, Planning and Design

Number of Staff of the Agency: Approximately 20,000 employee

Budget allocated to the Agency: Operating revenue in 2004/05 is TK. 4,470.5 Crore

### (4) Background/Justification of the Project

#### **< Present Condition of the Sector >**

For the last few years the country is facing serious load shedding due to shortage of generation capacity. The peak demand is expected as approximately 4,700MW as of 2006, while actual supplied capacity (maximum) has been 3,782MW dated on 30 October 2005, in which it is recognized that approximately 20% load shedding against the peak demand, i.e., approximately 1,000MW load shedding, has been consistently existed in the power system.

The demand in the country is increasing at the rate of about 8% per annum. As per PSMP<sup>1</sup>, the anticipated demand in 2025 will be 19,312 MW. It can be understood that around 20,000 MW of new power plants, i.e., 4 times against current installed capacity (4,995MW), shall be necessitated by 2025 to meet the future demand, taking account of 25% of reserve margin for achieving appropriate reliability in the system operations.

#### **< Sector Development Policy of the Government >**

Government of Bangladesh has planned to provide electricity for all citizens by the year 2020, as a national goal, though at present only 42% of the population is covered by

---

<sup>1</sup> PSMP: Power System Master Plan (PSMP) Update (TA No. 4379-BAN, Power Cell/ADB, June 2006)

electricity network and per capita electricity generation is about 165 KWh per annum which is one of the lowest in the world.

To achieve the abovementioned goal, power sector reform has been required and underway by Government of Bangladesh based upon "Power Sector Vision Statement in 2000", for which the principal components are i) segregation of power generation, transmission and distribution functions into separate services and creation of BPDB holding company as an apex body, ii) corporatization and commercialization of emerging power sector entities, iii) private sector participation and private-public partnership in power sector, iv) introduction of single buyer model as power market structure, etc.

### **< Problems to be solved in the Sector >**

#### **1) Gas Reserves in Bangladesh**

As mentioned in Draft National Energy Policy (2004), natural gas is currently the only indigenous non-renewable primary energy resource and now accounts for about 70% of the country's commercial energy supply. The proven and probable gas reserve of the 22 gas fields of the country is estimated as 28.4 Trillion Cubic Feet (TCF) out of which 20.5 TCF is considered recoverable. Out of this recoverable reserve, 5.1 TCF has been already consumed up to June 2003 and therefore the remaining recoverable reserve is expected as 15.4 TCF.

On the other hand, during 2001-2002 share of gas consumption is i) power 48%, ii) fertilizer 24% and iii) non-bulk 28% (industrial, commercial, domestic, tea estate, brick field and CNG).

It is therefore understood that the remaining available gas for the power sector can be expected as 15.4 TCF x 48% = 7.5 TCF, while it is described, in the power development plan upon sufficient gas (base) scenario, PSMP (2006), that 9.5 TCF shall be required up to 2025 for the power sector, for which the current expected gas availability, i.e., 7.5 TCF, will not be sufficient.

#### **2) Coal Reserves in Bangladesh**

As also mentioned in Draft National Energy Policy (2004), total coal in the 4 fields, i.e., Barapukuria, Phulbari, Khalaspir and Jamalgonj in the northwestern region, are estimated as around 2,527 million tons out of which about 492 million tons is recoverable. This recoverable reserve is equivalent to about 14.0 TCF of gas. So far only at Barapukuria mining site, an underground mine has been undertaken. The extraction of these indigenous coal deposits can be utilized as an alternative of gas fuel source for power generations. (However, Government of Bangladesh has not yet so far studied any

details for new coal power potential sites.)

### **3) Power Development Plan & National Energy Security**

Government of Bangladesh has already prepared PSMP for the future power system development scenarios which include “Sufficient Gas (Base) Scenario”, “Limited Gas Scenario”, and “Early Coal Scenario”. In the respective scenarios, approximately 20,000MW power capacities are planned to be set up by 2025. The details are hereinafter attached (refer to Attachment-2) and summarized as;

- “Sufficient Gas (Base) Scenario”: All of the new power developments consist of total 48 gas based power plants by 2025.
- “Limited Gas Scenario”: The new power developments consist of 34 gas based and 20 coal based (=domestic coal:8, imported coal:12) power plants by 2025. The operation of coal power plant is to start from 2017.
- “Early Coal Scenario”: The new power developments consist of 34 gas based and 20 coal based (=domestic coal:8, imported coal:12) power plants by 2025. The operation of coal power plant is to start from 2012.

It is herein noted that more than 85% of power capacity (MW) is currently depending upon domestic gas fuels and therefore the best energy mixes of power resources, i.e., fuel diversities, shall be required from now on for the national energy security as prepared in “Limited Gas Scenario” or “Early Coal Scenario”.

However, Government of Bangladesh has not yet studied/prepared any details for new 20 coal power potential sites except Barapukuria<sup>2</sup>, while a number of gas based power plants have been studied, planned in details and implemented for those constructions.

### **4) Regional Gap for Development**

Due to availability of indigenous natural gas, most of the power plants are situated in the eastern zone. Therefore, existing total generation capability in the western region is far below than the eastern region. As a result, power flows from the eastern to the western region cause terrible system loss, low voltage problems and load shedding, which has resulted in serious regional differentials of quality of life between the east and the west regions.

On the other hand, the potential sites so far investigated for domestic coal mining are located in the northwestern region such as Barapukuria, Phulbar, Khalaspir, etc. Also

---

<sup>2</sup> Barapukuria Domestic Coal Power Plant (500MW) is planed to be set up in 2012 in “the Early Coal Scenario”, however only 125MW out of 500MW are currently scheduled in BPDB’s planning as shown in Attachment-4.

imported coal may be available in the western region because the second largest port, Mongla, and the other river ports such as Khulna are located in the said region, while the first largest port Chittagon is located in the eastern region. A map of grid network and gas/coal mining fields can be shown in Attachment-3.

Therefore, it can be considered that the coal power developments in this country are necessitated not only for disseminating fuel diversities (the best energy mixes) but also for mitigating the regional gaps of life quality between the east and the west regions.

#### **5) National Energy Policy**

Government of Bangladesh has prepared "Draft National Energy Policy" in May 2004, which consists of "Power Policy", "Gas Policy", "Coal Policy", "Renewable Energy Policy", etc. and will be finalized in this year according to the 3-Year Road Map.

Those finalizations are underway however the following key issues have so far arisen;

- Petrobangla for Gas Sector reiterated that gas supply for new base load power plants will be available only up to 2012 unless new gas reserves can be discovered.
- Petrobangla for Coal Sector repeated that actual available coal mining amount shall be expected based upon the mining method, i.e., "open-cut method, in which approximately 80% of reserve can be extracted" or "tunneling method, in which only approximately 10% of reserve can be extracted", while "open-cut method" will cause social problems such as resettlement of the existing villagers. It might be therefore taken a lot of time for making a decision of the mining method upon the site by site basis.
- Government of Bangladesh stressed that National Energy Security such as; i) fuel diversities (the best energy mixes), ii) mitigation of regional gaps of life-quality, and iii) stable/cost minimized power supply shall be realized and therefore coal power developments must be urgently introduced in the Power Sector in due course.
- BPDB emphasized that although PSMP prepared the scenario for coal power developments BPDB has not yet studied any details for new coal power potential sites as well as those prioritizations for developments.

#### **<Outline of the Project>**

In light of the context described above, Government of Bangladesh herein strongly request JAPAN'S DEVELOPMENT STUDY PROGRAM for "the Master Plan Study on Coal Power Development in Bangladesh" in considerations of National Energy Security

such as; i) fuel diversities (the best energy mixes), ii) mitigation of regional gaps of life-quality, and iii) stable/cost minimized power supply. This shall include extractions of the new coal power potential sites as well as those development prioritizations in views of technical, social/environmental, and financial aspects with key optional case studies for some of unknown factors such as expectations of available coal/gas mining amounts.

**<Purpose (short-term objective) of the Project>**

- Setting up Master Plan on Coal Power Development in Bangladesh, taking consideration of National Energy Security

**<Goal (long-term objective) of the Project>**

- To achieve the government national goal, providing electricity for all citizens by 2020
- To achieve stable and cost-minimized power supply upon fuel diversities (the best energy mixes)
- To improve quality of life with economic growth especially in the western region of Bangladesh

**<Prospective beneficiaries>**

- Beneficiaries are all of Bangladeshis residents (approx. 140 million) those who use Bangladeshis national resources such as gas, coal, power, etc.
- In addition, the foreign investors connecting to the power grid will be also beneficiaries to receive stable and low-priced electricity.

(5) Desirable or Scheduled time of the commencement of the Study:

month January year 2008

(6) Other relevant Studies, if any.

- Power System Master Plan Update (Power Cell, ADB/TA No. 4379-BAN, June 2006)
- Preparation and Development of Gas Sector Master Plan and Strategy for Bangladesh, Bangladesh Gas Sector Master Plan (IDA Grant No. H092 BD, January 2006)

7. Any relevant information of the project from gender perspective.

Not Applicable

## 2. Terms of Reference of the proposed Study

### (1) Objectives of the Study:

- To extract new coal power potential sites
- To propose development prioritizations of the abovementioned potential sites
- To carry out human resource developments, for updating the said master plan in future
- To study the feasibility of setting up imported coal based power plants
- To identify the infrastructure needed for import and supply of coal to power plants.

### (2) Area to be covered by the Study:

Areas to be covered by the Study are all of Bangladesh.

### (3) Scope of the Study:

1. Evaluation of necessities of coal power developments in Bangladesh
  - (1) Review on Power/Energy Sectors such as gas mining/power, coal mining/power, hydropower import, renewable energy introduction, etc. in views of reserves/potentials, ongoing/committed projects, load/consumption forecasts, political matters and the like
  - (2) Review the existing power system development plans (up to 2025) upon least cost basis, involving the optimal resource mixes such as peak/middle/base load generation among domestic & imported coal/gas/hydro/renewable power plants in 2025
  - (3) Evaluate necessities of coal power developments upon the best energy mixes, and review required capacities (MW) as well as required coal amounts (ton) for the necessitated coal power plants up to 2025 taking considerations both of domestic and imported coals
  - (4) Study on some alternative case analyses for the best energy mixes upon unknown factors for practical coal resource availabilities, if required
2. Extractions and prioritizations of coal power potential sites
  - (1) Extract new potential sites for domestic/imported coal power plants, which are involved in the abovementioned items-1 (3)&(4)
  - (2) Prioritize those potential sites, considering the regional development gaps,



based upon technical, social/environmental and economic/financial aspects such as transportation of domestic/imported coals, accessibilities to the existing/planned bulk (400kV/230kV/132kV) transmission lines and substations, availabilities of lands, resettlements and water usages from river, sea, etc.

- (3) Check and evaluate the abovementioned development prioritization in view of the economical best energy mixes up to 2025.
- (4) Study on possibilities for application of Clean Coal Technologies (CCT) as well as Clean Development Mechanics (CDM) based thereupon in Bangladesh

(4) Study Schedule:

Month January Year 2008 to Month June Year 2008 : 06 months

(5) Expected Major Outputs of the Study:

- 1) Clarifying necessities of coal power development upon the national energy security, which includes;
  - ◇ Reviews of the existing power system development scenarios up to 2025
  - ◇ Study on some alternative case scenarios to be proposed for the best energy mixes, if required, for any unknown factors of practical coal resource availabilities
- 2) Extractions of new coal power potential sites both for domestic and imported coal to be considered
- 3) Development prioritizations of the coal power potential sites, which includes;
  - ◇ Evaluation of technical, social/environmental, and economic/financial aspects
  - ◇ Clarifying possibilities for application of Clean Coal Technologies (CCT) and also Clean Development Mechanics (CDM)

(6) Request for Input from Japanese Government

- 1) JICA will dispatch the Team with a total of 3 experts/20MM and relevant local consultants 60MM, covering the following areas during the period of the Technical Assistance.

a)	Team leader (power system planning)	8.0MM
b)	Coal Power Specialist	10.0MM
c)	Economic and Financial Specialist	2.0MM

d) Local Consultants

60.0MM

- 2) The Team will pursue technical transfer to the counterpart personnel for future updating of the master plan.

(7) Possibility to be implemented/expected funding resources:

- **Master Plan:** Japan's Development Study Program is expected for this master plan study.
- **Feasibility Study:** Regarding the first prioritized project extracted in this master plan, another Japanese TA can be anticipated for the full scale feasibility study
- **Development Implementation:** Japanese Yen Loan is expected for its development if the feasibility could be confirmed in the abovementioned feasibility study.

(8) Environmental and Social Considerations

Environmental Impact Study (EIA) is not required for this master plan however some reviews of social/environmental aspects shall be involved in the respective potential studies. Screening format for this matter can be described in Attachment-1.

(9) Request of the Study to other donor agencies, if any:

Government of Bangladesh has never requested the same study to other donors.

(10) Other relevant information

- Draft National Energy Policy (May 2004)
- Draft Renewable Energy Policy (February 2004)
- National Energy Policy (2007): Coal policy relating thereto will be finalized by Government of Bangladesh soon.

3. Facilities and information for the Study

(1) Assignment of counterpart personnel of the implementing agency for the Study:

< **Power Sector** >

- Director General, Power Cell, Power Division, Ministry of Power, Energy and Mineral Resources
- Chairman, Bangladesh Power Development Board (BPDB)
- Chief Engineer, Planning and Design, Bangladesh Power Development Board (BPDB)

- Director, System Planning Directorate, Bangladesh Power Development Board (BPDB)
- Managing Director, Power Grid Company of Bangladesh Ltd. (PGCB)
- Director Technical, Power Grid Company of Bangladesh Ltd. (PGCB)

**< Energy Sector >**

- Director General, Hydrocarbon Unit, Energy and Mineral Resources Division, Ministry of Power, Energy and Mineral Resources.
- Chairman, Bangladesh Oil, Gas & Mineral Corporation (Petrobangla)
- Director Technical, Bangladesh Oil, Gas & Mineral Corporation (Petrobangla)

(2) Available data, information, documents, maps, etc. related to the Study:

Government of Bangladesh will provide the Team with available data, maps and information necessary for the execution of the Project, which shall include and BPDB shall prepare the following documents;

- Power System Master Plan (PSMP) Update (TA No. 4379-BAN, Power Cell/ADB, June 2006)
- Preparation and Development of Gas Sector Master Plan and Strategy for Bangladesh (Under IDB Grant No. H092 BD, January 2006)
- Draft National Energy Policy (2004) or its update version

(3) Information on the security conditions in the Study Area:

Security conditions for carrying out the Project are fine.

4. Global Issues (Gender, Poverty, etc.)

(1) Women as main beneficiaries or not.

Not applicable

(2) Project components which require special considerations for women (such as gender difference, women specific role, women's participation), if any.

Not applicable

(3) Anticipated impacts on women caused by the Project, if any.

Not applicable

(4) Poverty alleviation components of the Project, if any.

(4) Poverty alleviation components of the Project, if any.

Poverty alleviation will be anticipated by the Goal of the Project.

(5) Any constraints against the low-income people caused by the Project.

Not applicable

5. Undertaking of (the recipient country)

(1) To ensure the necessary entry for the Team to conduct field surveys in Bangladesh

(2) To provide the Team with suitable office space in Dhaka and also at the site

(3) To exempt members of the Team from taxes and duties, and any other charges on the equipment, machinery and other materials brought into and out of Bangladesh for the conduct of the Project

(4) To provide the Team with medical services when needed but the expenses will be chargeable to the members of the Team

(5) To inform the Team of existing risks in the study area and measures deemed necessary to secure the safety

The Government of Bangladesh assures that the matters referred to in this form will be ensured for the smooth conduct of the Development Study by the Japanese Study Team.

[Signed by:]



[Title:]

S. M. Mesbahul Islam  
Joint Secretary  
Power Division  
M/O, Power, Energy & Mineral Resources  
Govt. of the People's Republic of Bangladesh

[Date:]

26 Aug. 2007

On behalf of the Government of People's Republic of Bangladesh

## ATTACHMENTS

- Attachment-1: Screening Format
- Attachment-2: Scenarios in Power System Master Plan  
(ADB/Power Cell, June 2006)
  - ◇ Gas Sufficient (Base) Scenario
  - ◇ Limited Gas Scenario
  - ◇ Early Coal Scenario
- Attachment-3: Map of Grid Network and Gas/Coal Fields
- Attachment-4: Power Development Plan up to 2012, BPDB

## Screening Format

(ATTACHEMENT-1)

### Question 1 Outline of the project

1-1 Does the project come under following sectors?

Yes       No

If yes, please mark corresponding items.

- Mining development
- Industrial development
- Thermal power (including geothermal power)
- Hydropower, dams and reservoirs
- River/erosion control
- Power transmission and distribution lines
- Roads, railways and bridges
- Airports
- Ports and harbors
- Water supply, sewage and waste treatment
- Waste management and disposal
- Agriculture involving large-scale land-clearing or irrigation
- Forestry
- Fishery
- Tourism

1-2 Does the project include the following items?

Yes       No

If yes, please mark following items.

- Involuntary resettlement      (scale:                      households                      persons)
- Groundwater pumping                      (scale:                      m<sup>3</sup>/year)
- Land reclamation, land development and land-clearing (scale:                      hectors)
- Logging    (scale:                      hectors)

1-3 Did the proponent consider alternatives before request?

Yes: Please describe outline of the alternatives  
 No

1-4 Did the proponent have meetings with the related stakeholders before request?

Yes                       No

If yes, please mark the corresponding stakeholders.

Administrative body

Local residents

NGO

Others ( )

Question 2

Is the project a new one or an on-going one? In the case of an on-going one, have you received strong complaints etc. from local residents?

New  On-going(there are complaints)  On-going (there are no complaints)

Others ( )

Question 3 Name of the law or guidelines:

Is Environmental Impact Assessment (EIA) including Initial Environmental Examination (IEE) required for the project according to a law or guidelines in the host country?

Yes  No (EIA is not required for the master plan study)

If yes, please mark the corresponding items.

Required only IEE (Implemented, on going, planning)

Required both IEE and EIA (Implemented, on going, planning)

Required only EIA (Implemented, on going, planning)

Others: ( )

Question 4

In case of that EIA was taken steps, was EIA approved by relevant laws in the host country? If yes, please mark date of approval and the competent authority.

<input type="checkbox"/> Approved: without a supplementary condition	<input type="checkbox"/> Approved: with a supplementary condition	<input type="checkbox"/> Under appraisal
--	---	--

(Date of approval: Competent authority: )

Not yet started an appraisal process

Others:( )

Question 5

If a certificate regarding the environment and society other than EIA is required, please indicate

the title of certificate.

- Already certified                       Required a certificate but not yet done

Title of the certificate :( \_\_\_\_\_ )

Not required

Others ( \_\_\_\_\_ )

**Question 6**

Are following areas located inside or around the project site?

- Yes     No     Not identified

If yes, please mark corresponding items.

- National parks, protected areas designated by the government (coast line, wetlands, reserved area for ethnic or indigenous people, cultural heritage) and areas being considered for national parks or protected areas
- Virgin forests, tropical forests
- Ecological important habitat areas (coral reef, mangrove wetland, tidal flats)
- Habitat of valuable species protected by domestic laws or international treaties
- Likely salts cumulus or soil erosion areas on a massive scale
- Remarkable desertification trend areas
- Archaeological, historical or cultural valuable areas
- Living areas of ethnic, indigenous people or nomads who have a traditional lifestyle, or special socially valuable area

**Question 7**

Does the project have adverse impacts on the environment and local communities?

- Yes             No             Not identified

Reason: ( This study is a master plan stage. )

**Question 8**

Please mark related environmental and social impacts, and describe their outlines.

- Air pollution
- Water pollution



- Soil pollution
- Waste
- Noise and vibration
- Ground subsidence
- Offensive odors
- Geographical features
- Bottom sediment
- Biota and ecosystem
- Water usage
- Accidents
- Global warming
- Involuntary resettlement
- Local economy such as employment and livelihood etc.
- Land use and utilization of local resources
- Social institutions such as social infrastructure and local decision-making institutions
- Existing social infrastructures and services
- The poor, indigenous or ethnic people
- Maldistribution of benefit and damage
- Local conflict of interests
- Gender
- Children's rights
- Cultural heritage
- Infectious diseases such as HIV/AIDS etc.
- Others ( )

**Question 9**

**Information disclosure and meetings with stakeholders**

9-1 If the environmental and social considerations are required, does the proponent agree on information disclosure and meetings with stakeholders in accordance with JICA Guidelines for Environmental and Social Considerations?

- Yes       No

9-2 If no, please describe reasons below.

[ ]

## (ATTACHMENT-2-1)

**Sufficient Gas (Base) Scenario: Power Development Plan**

(Data source: PSMP, Power Cell/ADB, June 2006)

Year	Peak Load, MW	Unit Additions, Number of Units			Installed Capacity, MW	System Reliability Indices		
		700 MW CC	450 MW CC	150 MW SCGT		LOLP, %	ENS, GWH	Reserve Margin, %
2005	4,308	0	0	0	4,458	8.138	180.8	3%
2006	4,693	0	0	0	4,683	10.884	320.9	0%
2007	5,112	0	0	0	5,425	6.350	137.5	6%
2008	5,569	0	0	2	6,002	5.135	108.3	8%
2009	6,066	0	1	0	7,313	0.845	8.9	21%
2010	6,608	0	2	0	7,986	0.750	8.2	21%
2011	7,148	0	1	1	8,586	0.797	9.0	20%
2012	7,732	0	2	0	9,449	0.490	5.1	22%
2013	8,364	0	1	1	9,979	0.834	10.1	19%
2014	9,047	0	2	0	10,879	0.654	7.4	20%
2015	9,786	0	2	1	11,579	0.937	12.6	18%
2016	10,512	0	2	0	12,479	0.848	11.2	19%
2017	11,291	0	0	5	13,229	0.997	13.5	17%
2018	12,128	1	0	2	14,229	0.912	12.2	17%
2019	13,027	1	0	3	15,243	0.880	11.9	17%
2020	13,993	2	0	0	16,643	0.578	6.7	19%
2021	14,924	1	0	3	17,455	0.816	11.2	17%
2022	15,917	2	0	0	18,526	0.949	15.6	16%
2023	16,977	2	0	1	19,867	0.811	12.5	17%
2024	18,107	2	0	0	21,070	0.923	15.9	16%
2025	19,312	1	0	4	22,370	0.950	16.1	16%
	Total	12	13	23	48			
	Total MW	8,400	5,850	3,450	17,700			
	Percent	47%	33%	19%	^ Total Units and MW Added			

**Limited Gas Scenario: Power Development Plan**

(Data source: PSMP, Power Cell/ADB, June 2006)

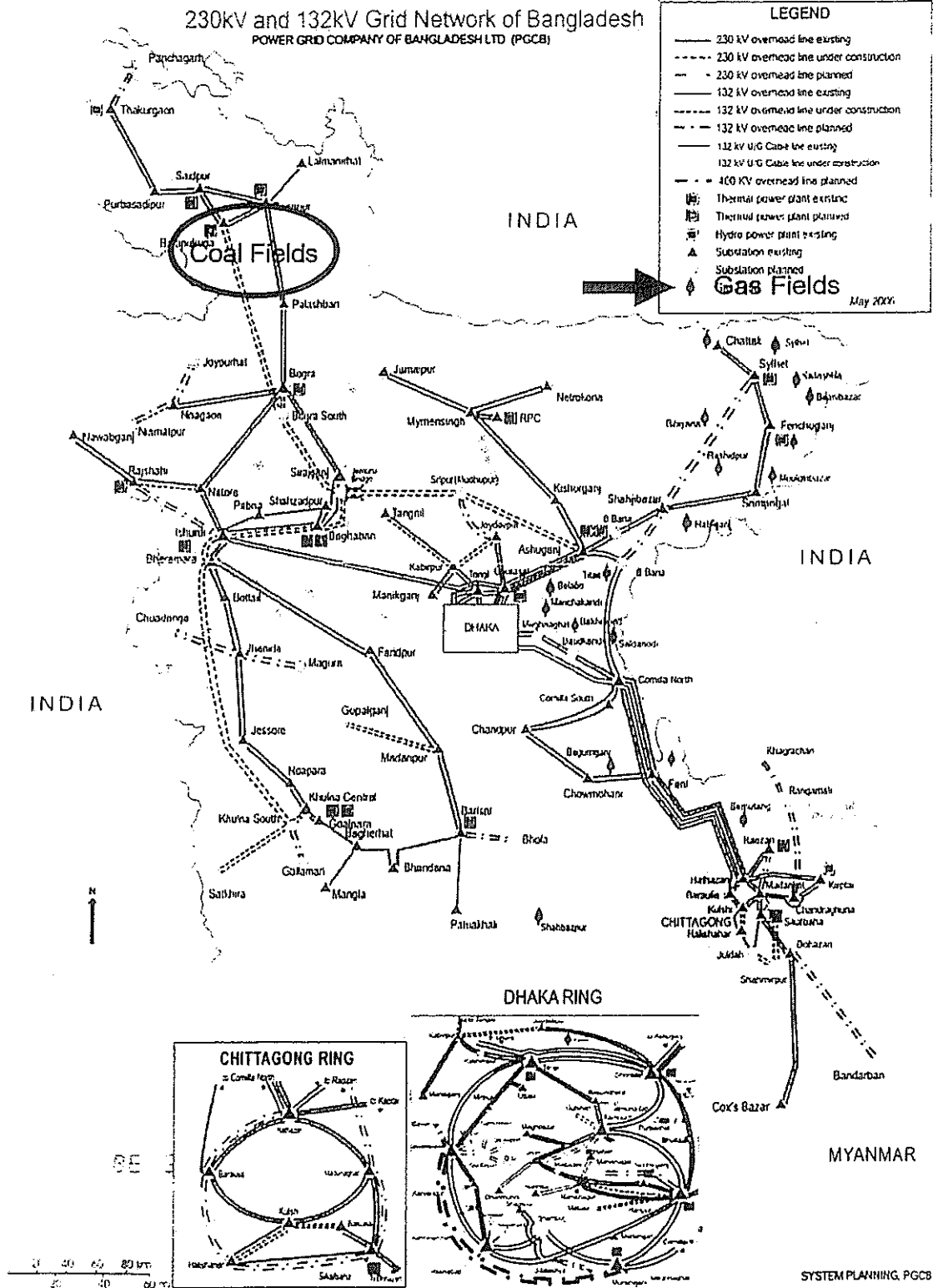
Year	Peak Load, MW	Unit Additions, Number of Units					Installed Capacity, MW	System Reliability Indices		
		700 MW CC	450 MW CC	150 MW SCGT	500 MW Dom Coal	500 MW Imp Coal		LOLP, %	ENS, GWH	Reserve Margin, %
2005	4,308	0	0	0	0	0	4,458	8.138	180.7	3%
2006	4,693	0	0	0	0	0	4,683	10.884	320.9	0%
2007	5,112	0	0	0	0	0	5,425	6.350	137.4	6%
2008	5,569	0	0	2	0	0	6,002	5.135	108.4	8%
2009	6,066	0	1	0	0	0	7,313	0.845	8.8	21%
2010	6,608	0	2	0	0	0	7,986	0.750	8.1	21%
2011	7,148	0	1	1	0	0	8,586	0.797	9.1	20%
2012	7,732	0	2	0	0	0	9,449	0.490	5.1	22%
2013	8,364	0	1	1	0	0	9,979	0.834	10.2	19%
2014	9,047	0	2	0	0	0	10,879	0.654	7.4	20%
2015	9,786	0	2	1	0	0	11,579	0.937	12.6	18%
2016	10,512	0	0	5	0	0	12,329	0.984	12.8	17%
2017	11,291	0	0	0	2	0	13,329	0.954	13.0	18%
2018	12,128	0	0	6	0	0	14,229	0.932	11.6	17%
2019	13,027	0	0	0	3	0	15,593	0.622	6.7	20%
2020	13,993	0	0	0	2	0	16,593	0.890	12.3	19%
2021	14,924	0	0	3	1	1	17,705	0.859	11.6	19%
2022	15,917	0	0	0	0	3	18,876	0.998	16.3	19%
2023	16,977	0	0	1	0	3	20,317	0.837	12.1	20%
2024	18,107	0	0	0	0	3	21,620	0.953	16.0	19%
2025	19,312	0	0	3	0	2	23,070	0.918	14.7	19%
Total		0	11	23	8	12	43			
Total MW		0	4,950	3,450	4,000	6,000	18,400			
Percent		0%	27%	19%	22%	33%	^ Total Units and MW Added			

**Early Coal Scenario: Power Development Plan**

(Data source: PSMP, Power Cell/ADB, June 2006)

Year	Peak Load, MW	Unit Additions, Number of Units					Installed Capacity, MW	System Reliability Indices		
		700 MW CC	450 MW CC	150 MW SCGT	500 MW Dom Coal	500 MW Imp Coal		LOLP, %	ENS, GWH	Reserve Margin, %
2005	4,308	0	0	0	0	0	4,458	8.138	180.8	4%
2006	4,693	0	0	0	0	0	4,683	10.884	320.9	0%
2007	5,112	0	0	0	0	0	5,425	6.350	137.5	6%
2008	5,569	0	0	2	0	0	6,002	5.135	108.3	8%
2009	6,066	0	1	0	0	0	7,313	0.845	8.9	21%
2010	6,608	0	2	0	0	0	7,986	0.750	8.2	21%
2011	7,148	0	1	1	0	0	8,586	0.797	9.0	20%
2012	7,732	0	1	0	1	0	9,499	0.471	5.0	23%
2013	8,364	0	1	1	0	0	10,029	0.823	10.2	20%
2014	9,047	0	1	0	1	0	10,979	0.633	7.5	21%
2015	9,786	0	1	1	1	0	11,729	0.885	12.6	20%
2016	10,512	0	1	2	0	0	12,479	0.995	14.6	19%
2017	11,291	0	1	0	1	0	13,429	0.968	14.2	19%
2018	12,128	0	1	1	1	0	14,529	0.790	10.6	20%
2019	13,027	0	0	4	1	0	15,493	0.876	12.3	19%
2020	13,993	0	0	4	1	0	16,593	0.890	12.3	19%
2021	14,924	0	0	3	1	1	17,705	0.859	11.5	19%
2022	15,917	0	0	0	0	3	18,876	0.998	16.2	19%
2023	16,977	0	0	1	0	3	20,317	0.837	12.2	20%
2024	18,107	0	0	0	0	3	21,620	0.953	16.0	19%
2025	19,312	0	0	3	0	2	23,070	0.918	14.6	20%
Total		0	11	23	8	12	43			
Total MW		0	4,950	3,450	4,000	6,000	18,400			
Percent		0%	27%	19%	22%	33%	^ Total Units and MW Added			

(ATTACHMENT-3)



**Map of Grid Network and Gas/Coal Fields**

## (ATTACHMENT-4)

**Power Development Plan up to 2012, BPDB**

**Bangladesh Power Development Board**  
**System Planning Directorate**  
**New Generation Projects upto 2012**

Date : 17.06.07  
 9E:\Project List\Newd 57.xls

Sl. No.	Generating Station	Type of Fuel	Capacity (MW)	Project Cost		Expected Commissioning date	Status (Source of Fund)
				Total (Million Taka)	Foreign (Million Taka)		
<b>Under-construction</b>							
<b>Public Sector</b>							
1	Sylhet(Fenchuganj) 90 MW CCPP 2nd Phase	Gas	35 GT 35 ST	7172	0	Oct/07 Dec/07 June/08	Contract Signed/ Construction work started (GOB)
<b>Sub-Total</b>			<b>185</b>	<b>7172</b>	<b>0</b>		
<b>New :Planned</b>							
<b>Public Sector</b>							
2	Siddhirganj 2x120 MW peaking power plant	Gas	240	6851	4184	FY 2009 (Dec/08)	Contract Signed (ADB)
3	Chandpur 150 MW CCPP (100 MW GT) and Associated Power Evacuation Facilities	Gas	100	6884	4780	FY 2009	Contractor is invited to Signed the Contract (GOB)
4	Sikalbaha 150 MW Gas Turbine	Gas	150	8047	5545	FY 2009	Tender under evaluation (Expected from GOB)
5	Sylhet 150 MW CCPP ( 100 MW GT ) and Associated Power Evacuation Facilities	Gas	100	4071	1065	FY 2010	Tender floated (Fund expected from GOB)
6	Siddhirganj 2x150 MW Gas Turbine P/S (Including evacuation facilities)	Gas	300	11113	7594	FY 2010	Tender to be floated (WB)
7	Haripur 360 MW Combined Cycle Power Plant	Gas	360	29205	18607	FY 2011	DPP under revision (JBIC)
8	210 MW Khulna Thermal Power Station	Gas	210	9275	8015	FY 2010	Tender floated (Expected Supplier's credit)
9	Bhola 150 MW CCPP	Gas	150	6251	3771	FY 2010	Feasibility Study will be undertaken soon (Fund expected from GOB)
10	Khulna 150 MW Peaking Power Plant	Gas	150	8050	5154	FY 2010	Loan Agreement to be signed (ADB)
11	210 MW Siddhirganj Thermal Power Station Unit #2	Gas	210	9220	5098	FY 2010	Credit Agreement to be signed (Russian state credit expected)
12	Sirajganj 150 MW Gas Turbine	Gas	150	6878	4331	FY 2010	Loan Agreement to be signed (ADB)
13	Kaptai Power Plant extension 2x50 MW (6th & 7th unit)	Hydro	100	8740	4078	FY 2012	(Not yet funded)
14	Sikalbaha 225 MW Combined Cycle Power plant	Gas	225	15890	11000	FY 2010	(Kuwait Fund Expected)
15	Sylhet 150 MW Gas Turbine	Gas	150	4070	1384	FY 2011	(Not yet funded)
16	Bheramara 450 Combined Cycle Power Plant	Gas	450	17456	7887	FY 2011	(Not yet funded)
17	Barapukuria 125 MW ( 3rd Unit ) Coal fired	Coal	125	10583	7075	FY 2011	(Chinese Suppliers Credit)
<b>Sub-total (Public Sector)</b>			<b>3276</b>	<b>167767</b>	<b>97668</b>		
<b>Private Sector</b>							
18	Baghabari (West Mont) CC: 40 MW ST addition to existing 80 MW	Gas	40			June/07	Under construction by IPP(Westmont) (IPP)
19	Baghabari (West Mont) 130 MW CC ( 90 MW +40 MW ST) (2nd Phase)	Gas	130	3900	3120	Fy 2009 (Jan/09)	Contract Signed West Mont (IPP)
20	Sirajganj 450 MW Combined Cycle Power Plant Unit #1	Gas	150 150 150	13807	8828	Nov/09 Dec/09 June/10	PQ process to be initiated soon
21	Meghnaghat 450 MW CC (Unit -2)	Gas	187 187 187	12050	7710	Nov/08 Jan/09 Nov/09	PPA , IA Signed
22	Meghnaghat 450 MW CC (Unit -3)	Gas	450	12050	7710	FY 2010	PQ to be invited (IPP)
23	Meghnaghat 450 MW CC (Unit -4)	Gas	450	12050	7710	FY 2011	(IPP)
24	Sirajganj 450 MW Combined Cycle Power Plant Unit-2	Gas	450	12050	7710	FY 2012	(IPP)
25	10-30 MW Small IPP	Gas	200			Oct/08	(IPP)
26	Rental Power Plant	Gas	260			Dec/08	(Rental)
<b>Mixed Sector/RPC</b>							
27	Mymensingh (RPC) CC : 70 MW ST	Gas	70			May/07	Test Run is going on (RPC)
<b>Sub-total</b>			<b>3081</b>	<b>66908.68</b>	<b>42788.31</b>		
<b>GRAND TOTAL (FY 2009 - FY 2012)</b>			<b>6336</b>	<b>219938</b>	<b>131688</b>		
<b>Public Sector</b>			<b>3276</b>	<b>164031</b>	<b>88399</b>		
<b>Private Sector</b>			<b>3081</b>	<b>66908.68</b>	<b>42788.31</b>		

Only Coal  
Power Plant



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE / INFORMATION REQUIRED		Plan Organization :	
PROJECT NAME: The Preparatory Survey on Master Plan Study on Coal Power Development in Bangladesh				Ref. No:	
				Issue Date:	
				Revision Date:	
No.	Questionnaire / Information Required	Reply	Remarks		
<b>1</b>	<b>Power Development General</b>				
<b>1.1</b>	<b>to MPEMR/BPDB</b>				
1.1.1	Latest Annual Report of BPDB.				
1.1.2	Latest progress report for Power Sector Reform as per “3-Year Road Map For Power Sector Reform (YEAR 2007 - 2009)”.				
1.1.3	Candidate site list for coal fired power plants based on PMSP gas limited scenario / early coal scenario to use domestic and imported coal They will be evaluated in the form of Table A, draft at this moment.				
1.1.4	Descriptions explaining Policy for coal transportation by railway and present conditions				
1.1.5	Descriptions explaining Policy for coal transportation by ship and present conditions				
1.1.6	Descriptions explaining Policy for Transmission Line				
<b>1.2</b>	<b>to BPDB</b>				
1.2.1	Power Plant Site conditions as follows 1) Available site space 2) Ground stiffness condition 3) Available water amount as cooling water and etc. Effect of difference between rainy and dry seasons is to				

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE / INFORMATION REQUIRED		Plan Organization :	
PROJECT NAME: The Preparatory Survey on Master Plan Study on Coal Power Development in Bangladesh				Ref. No:	
				Issue Date:	
				Revision Date:	
No.	Questionnaire / Information Required	Reply	Remarks		
1.2.2	<p>be considered.</p> <p>4) Road condition for transportation of machines</p> <p>Coal transportation by railway (In case railway is utilized)</p> <p>1) Distance from coalmine to the power station</p> <p>2) Available railway or easy extension</p> <p>3) Capacity of existing railway for coal transportation</p> <p>4) Additional facilities for coal handling</p> <p>5) Transportation cost by railway</p>				
1.2.3	<p>Coal transportation by ship (In case ship is utilized)</p> <p>1) Distance from coalmine to the power station</p> <p>2) Available port</p> <p>3) Available capacity for ship</p> <p>4) Influence of water level difference between rainy season and dry season</p> <p>5) Additional facilities for coal handling</p> <p>6) Transportation cost by ship</p>				
1.2.4	<p>Transmission line</p> <p>1) Latest existing situation of transmission line system</p> <p>2) Available power transmission capacity</p> <p>3) Loss of transmission</p> <p>4) Power transmission cost</p> <p>5) Study on stability of transmission if available, Stability of tide current</p>				



<b>JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)</b>		<b>QUESTIONNAIRE / INFORMATION REQUIRED</b>		Plan Organization :
PROJECT NAME: The Preparatory Survey on Master Plan Study on Coal Power Development in Bangladesh				Ref. No:
				Issue Date:
				Revision Date:
<b>No.</b>	<b>Questionnaire / Information Required</b>	<b>Reply</b>	<b>Remarks</b>	

	Power system dynamic stability		
--	--------------------------------	--	--

<b>2</b>	<b>Support by other donors</b>		
<b>2.1</b>	<b>to ADB</b>		
2.1.1	What is ADB's stance or opinion in Bangladesh on the followings? - Shortage of gas for power plants - Application of coal for power plants		
2.1.2	Is there any plan to support to update current PMSP?		
2.1.3	Did ADB provide any financial assistance for Phulubari coal mine development project?		
<b>2.2</b>	<b>to WB</b>		
2.2.1	What is WB's stance or opinion in Bangladesh on the followings? - Shortage of gas for power plants - Application of coal for power plants		

<b>3</b>	<b>Coal Development General</b>		
<b>3.1</b>	<b>To Ministry of Power, Energy and Mineral Resources EMRD (Energy and Mineral Resources Division)</b>		
3.1.1	Organization Chart		

<b>JAPAN INTERNATIONAL COOPERATION AGENCY</b> <b>(JICA)</b>		<b>QUESTIONNAIRE / INFORMATION</b> <b>REQUIRED</b>		Plan Organization :
<b>PROJECT NAME:</b> The Preparatory Survey on Master Plan Study on Coal Power Development in Bangladesh				Ref. No:
				Issue Date:
				Revision Date:
No.	Questionnaire / Information Required	Reply	Remarks	
3.1.2	Bangladesh Coal policy (the latest one)			
3.1.3	Coal Price Coal price data and current price fixing mechanism are desired to be provided.			
3.1.4	Policy of coal development such as mining lease, exploration, foreign investment etc.			
3.1.5	Bangladesh Coal production Statistics(the latest one)			
3.1.6	Present situation of Phulbari coal development plan			
<b>3.2</b>	<b>To Petrobangla</b>			
3.2.1	Annual Report of Petrobangla			
<b>3.3</b>	<b>To Barapukuria Mining Company Ltd.</b> <b>(BCMCL)</b>			
3.3.1	Annual Report or introduction paper of Barapukuria Mining Company Ltd. (BCMCL)			
3.3.2	Coal production Plan including present U/G and future O/C			
3.3.3	Coal quality each coal seam			
3.3.4	Mine map of Barapukuria coal mine			
3.3.5	Geological condition of coal seam of Barapukuria coal mine			
3.3.6	Coal seam map of Barapukuria coal mine			

<b>JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)</b>		<b>QUESTIONNAIRE / INFORMATION REQUIRED</b>		Plan Organization :	
PROJECT NAME: The Preparatory Survey on Master Plan Study on Coal Power Development in Bangladesh				Ref. No:	
				Issue Date:	
				Revision Date:	
<b>No.</b>	<b>Questionnaire / Information Required</b>	<b>Reply</b>	<b>Remarks</b>		

3.3.7	Environmental law and regulation for coal mining		
<b>3.4</b>	<b>To The Geological Survey of Bangladesh (GSB)</b>		
3.4.1	Coal resources and coal quality of each coal field		
3.4.2	Geological information of Phulbari coal field		
3.4.3	Coal seam map of Phulbari coal field		
3.4.4	Coal quality of Phulbari coal field		

<b>4</b>	<b>Environmental and Social Considerations</b>		
<b>4.1</b>	<b>To Ministry of Environment and Forest (MOEF)/ BPDB</b>		
4.1.1	<b>EIA</b> 4.1.1.1 EIA reports on the projects done by other donors 4.1.1.2 EIA clearance certificate obtained in previous projects 4.1.1.3 Minutes of stakeholders/public meetings held in previous projects		
4.1.2	4.1.2.1 Opinions presented by other than governmental organizations about construction of thermal power plants through papers or web-site whatever		

<b>JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)</b>		<b>QUESTIONNAIRE / INFORMATION REQUIRED</b>		Plan Organization :
PROJECT NAME: The Preparatory Survey on Master Plan Study on Coal Power Development in Bangladesh				Ref. No:
				Issue Date:
				Revision Date:
<b>No.</b>	<b>Questionnaire / Information Required</b>	<b>Reply</b>		<b>Remarks</b>

4.1.3	<p><b>Involuntary resettlement</b></p> <p>4.1.3.1 Land Acquisition Act (1894) and the Acquisition and Requisition of Immovable Property Rules(1982)</p> <p>4.1.3.2 Current procedures on land acquisition done by ADB and WB</p> <p>4.1.3.3 Experiences of involuntary resettlement in the energy sector including RAP (Resettlement Action Plan) and external monitoring reports</p> <p>4.1.3.4 Experiences/lessons learned by previous human relocation</p>		
4.1.4	<p><b>Social environment</b></p> <p>4.1.4.1 Census and socio-economic data (population, income, occupation, education, etc)</p> <p>4.1.4.2 Distribution of socially vulnerable groups including very poor, landless and indigenous people</p> <p>4.1.4.3 Land-use map</p> <p>4.1.4.4 Circumstances of relevant water utilization (agriculture, etc.)</p> <p>4.1.4.5 Legislation and /or execution of water rights</p> <p>4.1.4.6 Cultural heritage map</p> <p>4.1.4.7 Tourism spots map (e.g. rafting)</p> <p>4.1.4.9 Distributions of infrastructures such as road, railway, power line, river transportation, etc.</p>		

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE / INFORMATION REQUIRED	
PROJECT NAME: The Preparatory Survey on Master Plan Study on Coal Power Development in Bangladesh		Plan Organization :	
		Ref. No:	
		Issue Date:	
		Revision Date:	
No.	Questionnaire / Information Required	Reply	Remarks

4.1.5	<p><b>Natural Environment</b></p> <p>4.1.5.1 Water quality, air quality and noise level monitoring results</p> <p>4.1.5.2 Restriction on development in national parks, relevant laws</p> <p>4.1.5.3 Standard for Quality on similar projects</p> <p>4.1.5.4 Earthquake data/map</p> <p>4.1.5.5 Red data book</p> <p>4.1.5.6 Geological data/map</p> <p>4.1.5.7 Meteorological data</p> <p>4.1.5.8 Hydrological data of rivers</p> <p>4.1.5.9 Hazard map and/or natural disaster records.</p>		
4.2	<b>MOEF</b>		
4.2.1	<p><b>Environmental Administration</b></p> <p>4.2.1.1 Annual budget</p> <p>4.2.1.2 Number of staff, business and expertise</p> <p>4.2.1.3 Organization Chart</p> <p>4.2.1.4 Responsibilities of the organizations</p>		
4.2.2	<p><b>EIA</b></p> <p>4.2.2.1 Confirmation of necessary procedures on the thermal power generation projects in terms of the EIA guidelines</p> <p>4.2.2.2 EIA guidelines for Industries</p> <p>4.2.2.3 National environmental policies</p>		

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		QUESTIONNAIRE / INFORMATION REQUIRED		Plan Organization :
PROJECT NAME: The Preparatory Survey on Master Plan Study on Coal Power Development in Bangladesh				Ref. No:
				Issue Date:
				Revision Date:
No.	Questionnaire / Information Required	Reply	Remarks	

4.3	<b>Local Consultants able to implement EIA/Monitoring</b>		
4.3.1	4.3.1.1 List/contact details of local consultants EIA/ monitoring 4.3.1.2 Company brochure including names of EIA activities engaged before 4.3.1.3 Price lists		
4.4	<b>University/Research Center able to implement EIA/ Monitoring</b>		
4.4.1	4.4.1.1 List/contact details of universities/research centers for EIA/ monitoring 4.4.1.2 University brochure 4.4.1.3 Price list, if any		
4.5	<b>Local/international NGOs able to support Project Affected Persons</b>		
4.5.1	4.5.1.1 List of micro credit NGO 4.5.1.2 List of socially contributing NGO by other than micro credit		

<b>5</b>	<b>Barakupuria Power Plant</b>		
<b>5.1</b>	<b>To BPDB</b>		
5.1.1	Please provide the outline of Barakupuria power plant - Environmental Impact Assessment - Financing Arrangement		

<b>JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)</b>		<b>QUESTIONNAIRE / INFORMATION REQUIRED</b>		Plan Organization :
PROJECT NAME: The Preparatory Survey on Master Plan Study on Coal Power Development in Bangladesh				Ref. No:
				Issue Date:
				Revision Date:
<b>No.</b>	<b>Questionnaire / Information Required</b>	<b>Reply</b>	<b>Remarks</b>	

	<ul style="list-style-type: none"> <li>- Selection of Consultants and Contractors</li> <li>- Design and Engineering</li> <li>- Construction</li> </ul>		
5.1.2	<p>Please provide the design conditions and actual operating conditions for two coal fired plants described in attached sheet Table 1 to 3.</p> <p>Table 1 Plant Outline            Table 2 Requested reliability data is attached.            Table 3 Requested performance data sheet is attached.</p>		

**Table 1: Plant Outline**

**Barakusuria P.S.**

No	Item	unit	
1	Space of power station	m2	
2	Space of coal yard	m2	
3	Commercial operation date	yy/mm/dd	
4	Number of employee		
5	Number of engineers		
6	Number of plant operators		
7	Boiler manufacture		
8	Turbine manufacture		
9	Treatment of ash disposal		
10			



**Table 2: Plant Reliability and Availability**  
**Barakusuria P.S.**

No	Item	unit	Unit No.1		Unit No.2	
			2006	2007	2006	2007
1	Total operation hour	Hrs				
2	Planned outage	Hrs				
3	Number of planned outage					
4	Unplanned outage	Hrs				
5	Number of unplanned outage					
6	List of unplanned outage					
7						
10	Availability	%				
11	Total power generation (Gross)	MWh/year				
12	Total power generation (Net)	MWh/year				
13	Maximum power generation	MW				
14	Mean power generation	MW				
15	Load factor	%				
16						
17						

**Table 3: Performance Benchmark of Power Plant**

**Barakusuria P.S.**

No	Item	unit	Design	Unit No.1	Unit No.2
1	Load (MW) : generator end	MW			
2	Load (MW) : transmission end	MW			
3	Frequency	Hz			
4	Plant efficiency	%			
5	Heat Rate	kcal/kWh			
6	Boiler efficiency	%			
7	Low Calorific value of fuel	kcal/kg			
8	Fuel flow	T/h			
9	Air flow	T/h			
10	Air temperature (Air heater inlet)	°C			
11	Air temperature (Air heater outlet)	°C			
12	Flue gas temperature (Air heater inlet)	°C			
13	Flue gas temperature (Air heater outlet)	°C			
14	Flue gas O <sub>2</sub> (Air heater inlet)	%			
15	Flue gas O <sub>2</sub> (Air heater outlet)	%			
16	Flue gas CO <sub>2</sub>	%			
17					
18	Main steam flow	T/h			
19	Main steam pressure	kg/cm <sup>2</sup>			
20	Main steam temperature	°C			
21	Reheat steam pressure	kg/cm <sup>2</sup>			
22	Reheat steam temperature	°C			
23	Reheater inlet steam pressure	kg/cm <sup>2</sup>			
24	Reheater inlet steam temperature	°C			
25	Reheater spray flow	T/h			
26					
27	Feed water flow	T/h			
28	Feed water temperature (boiler inlet)	°C			
29	Feed water pressure	kg/cm <sup>2</sup>			
30					
31	Condenser vacuum	mmHg			
32	Condenser cooling water temperature (in)	°C			
33	Condenser cooling water temperature (ou	°C			
34					
35	Generator voltage	kV			
36	Power factor				
37					
38	Boiler flue gas				
39	Sox				
40	Nox	ppm			
41	Solid particles	g/m <sup>3</sup> N			

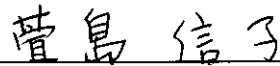
Table A Bangladesh/ Evaluation items for coal fired power plant (Candidate PS)

PC090209

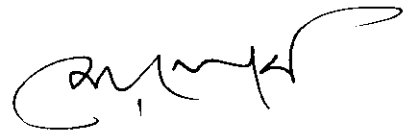
NO	Item	A Site	B Site
1	<p>Power Plant Site conditions</p> <ol style="list-style-type: none"> <li>1) Site space (Including coal yard &amp; Ash mound)</li> <li>2) Ground condition                             <ol style="list-style-type: none"> <li>a) Seismic condition</li> <li>b) Ground stiffness</li> </ol> </li> <li>3) Water (River or sea )                             <ol style="list-style-type: none"> <li>a) Available cooling water amount</li> <li>b) Available make up water</li> </ol>                             Difference between rainy and dry seasons                              Influence of tidal range                         </li> <li>4) Road condition for transportation of machines</li> </ol>		
2	<p>Coal</p> <ol style="list-style-type: none"> <li>1) Coal mine</li> <li>2) Coal specification</li> <li>3) Coal price</li> <li>4) Available coal amount</li> <li>5) Infrastructure for coalmine</li> </ol>		
3	<p>Coal transportation</p> <ol style="list-style-type: none"> <li>1. Transportation by railway                             <ol style="list-style-type: none"> <li>1) Distance from coalmine to the power station</li> <li>2) Available railway or easy extension</li> <li>3) Capacity of existing railway for coal</li> <li>4) Additional facilities for coal handling</li> <li>5) Transportation cost by railway</li> </ol> </li> <li>2. Transportation by ship                             <ol style="list-style-type: none"> <li>1) Distance from coalmine to the power station</li> <li>2) Available port</li> <li>3) Available capacity for ship</li> <li>4) Influence of water level difference between rainy season and dry season</li> <li>5) Additional facilities for coal handling</li> <li>6) Transportation cost by ship</li> </ol> </li> </ol>		
4	<p>Power Transmission</p> <ol style="list-style-type: none"> <li>1) Distance from power demand area</li> <li>2) Available power transmission capacity</li> <li>3) Additional cost for power transmission line</li> <li>4) Voltage</li> <li>5) Loss of transmission</li> <li>6) Power transmission cost</li> <li>7) Stability of transmission                             <ol style="list-style-type: none"> <li>a) Stability of tide current</li> <li>b) Power system dynamic stability</li> </ol> </li> </ol>		
5	<p>Environmental conditions</p> <ol style="list-style-type: none"> <li>1) EIA including regulation around site                             <ol style="list-style-type: none"> <li>a) Atmospheric condition</li> <li>b) Regulation for waste water</li> </ol> </li> <li>2) Involuntary resettlement</li> <li>3) Social environment</li> <li>4) Natural Environment</li> </ol>		
6	<p>Operation &amp; maintenance</p> <p>Advantage for employment of qualified engineers</p>		
7	<p>Power Plant Outline</p> <ol style="list-style-type: none"> <li>1. Boiler &amp; Turbine                             <ol style="list-style-type: none"> <li>1) Power capacity</li> <li>2) Type</li> </ol> </li> <li>2. Environmental facilities                             <ol style="list-style-type: none"> <li>1) Dust remover (Electric filter or Bag filter)</li> <li>2) DeSO<sub>x</sub></li> <li>3) DeNO<sub>x</sub></li> </ol> </li> <li>3. Coal loading &amp; unloading facilities</li> </ol>		

**SCOPE OF WORK**  
**FOR**  
**THE STUDY FOR**  
**MASTER PLAN ON COAL POWER DEVELOPMENT**  
**IN BANGLADESH**  
**AGREED UPON BETWEEN**  
**MINISTRY OF POWER, ENERGY AND MINERAL**  
**RESOURCES**  
**JAPAN INTERNATIONAL COOPERATION AGENCY**

**Dhaka, June 21, 2009**



Nobuko Suzuki Kayashima  
Chief Representative  
Japan International Cooperation Agency  
Bangladesh Office



Md. Msharraf Hossain Bhuiyan, ndc  
Additional Secretary  
Economic Relations Division  
Ministry of Finance



M. Shamsul Kibria  
Joint Secretary (Development)  
Power Division  
Ministry of Power, Energy and Mineral  
Resources

## 1. INTRODUCTION

In response to the request of the Government of People's Republic of Bangladesh (hereinafter referred to as "the Government of Bangladesh"), the Government of Japan decided to conduct the Study for Master Plan on Coal Power Development (hereinafter referred to as "the Study").

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan, will jointly undertake the Study in close cooperation to the authorities concerned of the Government of Bangladesh.

The present document sets forth the Scope of Work with regard to the Study.

## 2. OBJECTIVES OF THE STUDY

The main objective of the Study is to formulate the Coal Power Development Master Plan up to 2025 which shall be practical and comprehensive.

## 3. STUDY AREA

The Study will cover entire area of Bangladesh.

## 4. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the scope of work for the Study shall cover the following items:

### 4.1 Data Collection and review on existed policies

(1) Data Collection and Review

- Collect and review the necessary data such as the existing power system data, the latest power system development plan, and the other relevant data.

(2) Review on policies

- Review on the policies such as energy policy, coal policy, renewable energy policy, etc.

### 4.2 Situation Analysis of primary energies for power in Bangladesh

(1) Domestic coal usage

- Review the coal mine activities and plans in Bangladesh
- Study possibilities for domestic coal supply to the power sector

(2) Imported coal usage

- Study possibility for imported coal usage in the power sector
- Compile business plan of imported coal usage such as purchase agreement, transportation scheme and evaluation of quality and quantity of coal

1

- (3) Other primary energy
- Study possibility for the other primary energy resources for power development such as gas, liquid fuel, renewable, nuclear energies, power purchase from neighboring countries, etc.

#### **4.3 Preparation of Power System Development Plan**

- (1) Demand Forecast
- Review power demand up to 2025 based on the PSMP (2005).
- (2) Power Development Plan
- Prepare power development plan up to 2025
  - Examine base scenario as well as alternative scenarios, considering various power sources such as coal power, gas power, nuclear power, renewable power, hydropower imported from neighboring countries (power grid interconnection), etc.
  - Identify generation types, capacities and specific project sites
- (3) Transmission Development Plan
- Prepare transmission/substation development plan up to 2025
- (4) Financial analysis
- Study on cost analysis and financing strategies

#### **4.4 Selection of high priority-potential projects**

- Make short list on high priority-potential projects in terms of technical, environmental/social issues which follow the Government of Bangladesh and JICA guidelines and cost analysis.

#### **4.5 Workshop**

Disseminated seminar will be held occasionally during study period. Technical workshop will be held at the occasions of Draft Final reporting.

### **5. STUDY SCHEDULE**

The Study will be carried out in accordance with the Tentative Study Schedule as attached in the Appendix. The schedule is tentative and subject to modification when both parties agree upon any necessity that may arise during the course of the Study.

### **6. REPORTS**

JICA shall prepare and submit following reports in English to the Government of Bangladesh through the Ministry of Power, Energy and Mineral Resources (hereinafter referred to as "MPEMR").

- (1) Inception Report:  
Ten (10) copies of English version



2



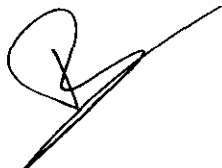
- (2) Interim Report:  
Ten (10) copies of English version
- (3) Draft Final Report:  
Twenty (20) copies of English version

MPEMR shall provide its comments on behalf of the Government of Bangladesh within one month after the receipt of the Draft Final Report.

- (4) Final Report:  
Thirty (30) copies of English version will be submitted within six weeks after the receipt of the comments on the Draft Final Report.

## **7. UNDERTAKINGS OF GOVERNMENT OF BANGLADESH**

- (1) In order to facilitate the smooth conduct of the Study, the Government of Bangladesh shall take necessary measures:
  - a) to permit the members of the JICA Study Team to enter, leave and sojourn in Bangladesh for the duration of their assignments therein, and exempt the members of the JICA Study Team from foreign registration requirements and consular fees;
  - b) to exempt the members of the JICA Study Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of Bangladesh for the conduct of the Study;
  - c) to exempt the members of the JICA Study Team from income taxes and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the JICA Study Team for their services in connection with the implementation of the Study;
  - d) to provide necessary facilities to the JICA Study Team for remittances as well as for the utilization of funds introduced into Bangladesh from Japan in connection with the implementation of the Study;
  - e) to facilitate prompt clearance through customs and inland transportation of equipment, materials and supplies required for the Study and of the personal effects of the members of the JICA Study Team.
- (2) The Government of Bangladesh shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the JICA Study Team.
- (3) Ministry of Power, Energy and Mineral Resources (MPEMR) shall be the responsible organization for the Study and also the coordinating body in relations with the other governmental and non-governmental organizations concerned for the smooth implementation of the Study. Power Cell/BPDB shall act as the counterpart agency to the JICA Study Team.



3



(4) MPEMR, at its own expense, provides the JICA Study Team with the following, in cooperation with other organizations concerned.

- a) security-related information on as well as measures to ensure the safety of the Japanese study team,
- b) information on as well as support in obtaining medical services,
- c) available data (including maps and photographs) and information related to the study,
- d) counterpart personnel,
- e) suitable office space with necessary equipment and facilities in Dhaka,
- f) credentials or identification cards, and
- g) communication facilities such as telephone, facsimile, E-mail, if necessary.

## **8. EFFECTUATION OF SCOPE OF WORK**

Scope of Work of the Study will come into effect after completing necessary arrangement between JICA and the Government of Bangladesh.

## **9. CONSULTATION**

JICA and MPEMR will consult with each other in respect of any matter that may arise from or in connection with the Study.



:END

Appendix : Tentative Study Schedule



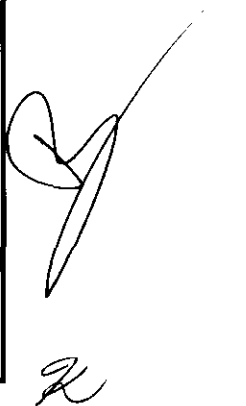


APPENDIX  
Tentative Study Schedule

Study Content	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Data Collection and Review Existing Policies	■														
2. Situation Analysis on Coal Development		■													
3. Situation Analysis on Primary Energy Balance			■												
4. Study of potential power station sites				■											
5. Preparation of Optimal Plan								■							
6. Selection of Potential Sites									■						
7. Environmental and Social Considerations										■					
Report	△	Ic/R							△	It/R			△	Df/R	F/R
Workshop and Seminar		△							△				△		Workshop

Note

■ Working period



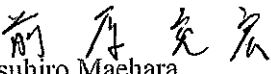
Ic/R: Inception Report  
F/R: Final Report

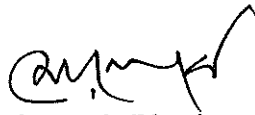
It/R: Interim Report  
Df/R: Draft Final Report

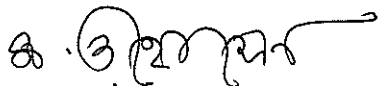
WS: Workshop

MINUTES OF MEETING  
FOR  
THE STUDY ON MASTER PLAN ON COAL POWER  
DEVELOPMENT IN THE PEOPLE'S REPUBLIC OF  
BANGLADESH  
AGREED UPON BETWEEN AUTHORITEIS CONCERNED OF  
THE PEOPLE'S REPUBLIC OF BANGLADESH  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

Dhaka, 25<sup>th</sup> February, 2009

  
Mitsuhiro Maehara  
Team Leader  
Preparatory Survey Team  
Japan International Cooperation Agency

  
Md. Mosharraf Hossain Bhuyian. ndc  
Additional Secretary  
Economic Relations Division  
Ministry of Finance

  
Mohammad Wahid Hossain, ndc  
Joint Secretary (Administration)  
Power Division  
Ministry of Power, Energy and Mineral  
Resources

The Government of the People's Republic of Bangladesh (hereinafter referred to as "the Government of Bangladesh") officially requested the Government of Japan to extend technical assistance for carrying out the Study on Master Plan Study on Coal Power Development in the People's Republic of Bangladesh (hereafter referred to as "the Study") in August 2007. In response to the request, the Preparatory Survey Team (hereafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereafter referred to as "JICA") was dispatched and had a series of discussions with the Ministry of Power, Energy and Mineral Resources (hereinafter referred to as "MPEMR"), Economic Relations Division, Ministry of Finance (hereinafter referred to as "ERD") and other authorities concerned with the Government of Bangladesh from 18<sup>th</sup> February to 25<sup>th</sup> February. (List of Main Attendance is shown in ANNEX 1.)

Discussions were conducted in a friendly and cordial atmosphere and both parties agreed to record the following points as summarized conclusion of the discussions.

## 1. Main Discussions

- a) Although the Government of Bangladesh is still in process of adopting a Coal Policy, authorities concerned agreed on main concept of the Study proposed by the Team.
- b) Both sides agreed that the Study should formulate power system development plan up to 2025 and also should make endeavor to achieve the Government of Bangladesh's goal, "electricity for all by 2020".
- c) Both sides agreed that, considering present gas reserve scenario, the Study should review and update Power System Master Plan 2005.
- d) Both sides agreed that the Study should consider various sources of primary energies, i.e., not only coal but also gas, oil, nuclear, imported-hydro, renewable energy, etc. for power development plans.
- e) Both sides discussed some of potential sites for coal power plants and others in the attached list (Annex 2).
- f) The Government of Bangladesh requested the Team to use the CYME software for grid system stability analysis, because of being familiar to Bangladesh side.
- g) The Team confirmed that if required coal import for power stations could be exercised by the power sector entities as Bangladesh Power Development Board had imported coal for Barapukuria#1-2 power station.
- h) Both sides confirmed that the Study should identify high priority generation and transmission projects, etc. for early implementation, and feasibility studies for identified projects would be required separately.
- i) The Team confirmed that there was no existing Coal Sector Master Plan presently but it would be prepared after coal policy is approved.
- j) Both sides understood that high efficiency coal power plants should be considered in the Study.

## 2. Relevant Discussions



- a) During discussion with Power Division, MPEMR, The Government of Bangladesh requested JICA's financing to Barapukuria Coal Power Station #3 (125MW), as issued the request letter (ERD/JAP-1/project/proposal/09 /2007 /(part-1)/36) to JICA dated upon 4<sup>th</sup> February 2009, and the Team expressed the views that JICA may consider much higher efficiency coal power plants for cooperation.
- b) During discussion with Petrobangla, it was mentioned that The Government of Bangladesh will request JICA soon to support environmental/social mitigation activities for development of the Barakupuria coalmine site. The Team informed in the meeting that JICA may consider the request separately.
- c) The Team informed in the meeting with Power Division, MPEMR, that Asian Development Bank (ADB), who assisted in the preparation of PSMP 2005, has already understood the concept of the Study.

### **3. Signing of the Scope of Work Agreed**

After discussions and the basic agreement on the Draft Scope of Work shown in ANNEX 3, the Draft Scope of Work will be forwarded to relevant authorities for their final review. The comments from above mentioned organizations would be considered for incorporation into the Draft Scope of Work before finalization. After the final approval by JICA Headquarters, MPEMR, ERD and JICA Bangladesh office will sign the Scope of Work. Then, JICA Headquarters will process for appointment of consultant for the Study.

### **4. Establishment of Steering Committee**

In order to do successful implementation of the Study, Steering Committee (SC) shall be formed during the study period. SC will make key decisions during the Study. SC will be headed by Secretary, Power Division, MPEMR. Power Cell under Power Division/BPDB will be responsible for overall management and coordination for the Study.

SC will consist of Power Division, Energy Division MPEMR, Bangladesh Power Development Board and other power utilities, Ministry of Environment and Forest, ERD, and Finance Division Ministry of Finance. SC Members and JICA will have joint meeting occasionally.

### **5. Office space with necessary equipment**


Power Division, MPEMR agreed to provide JICA Study Team with adequate office space with enough furnishing, a telephone line and internet access that are needed to carry out the Study in Dhaka.

END

Annex 1: Attendance List

2: Potential Sites List

3: Draft Scope of Work



## List of Main Attendance

### **Ministry of Power, Energy and Mineral Resources**

Mr. Nasiruddin Ahmed (Secretary, Power Division)  
Mr. Ahmed Ullah (Joint Secretary, Energy Division)  
Mr. Mohammad Abdul Jalil (Director General, Power Cell)  
Mr. Mizanur Rahman (Deputy Director, Power Cell)

### **Economic Relations Division, Ministry of Finance**

Mr. Md. Mosharraf Hossain Bhuiyan. ndc (Additional Secretary)

### **Bangladesh Power Development Board**

Mr. Md. Showkat Ali (Chairman)

### **Petrobangla**

Mr. Jalal Ahmed (Chairman)

### **Barakupuria Coal Mining Company Ltd**

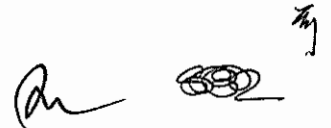
Mr. Khurshidul Hasan (Managing Director)

### **JICA Preparatory Survey Team**

Mr. Mitsuhiro Maehara (Team Leader)  
Mr. Koji Jitsukawa (Study Planning)  
Mr. Hajime Endo (Coal Development Technology)  
Mr. Takeo Shoji (Environmental and Social Considerations)

### **JICA Bangladesh Office**

Mr. Mitsuaki Suzuki (Representative)  
Mr. Zaki Md. Ziaul Islam (Program officer)  
Mr. Seiichi Suzuki (JICA expert)



Results of Informal Discussion between the Team and Power Entities  
For Potencial Sites of Coal Power Station and others

Annex 2

Name	Expected Developer	Land (acre)	Resettlement (persons)	Capacity (MW)	Coal / Source (t/day)	Coal Transportation	Evacuation	Water Resources	Concern / Others
Barakupuria	NWPGCL /IPPs	200	0	1,000	10000 /domestic	By belt conveyor	230kV / 700MW line available	20Km far away	Not enough coal, Open pit/tunnel?
Barapukuria #3	BPDB	Already prepared	0	125	1250 /domestic	By belt conveyor	230kV / 700MW line available	Beside river	Low efficiency / Requested to JICA
Khulna	NWPGCL /IPPs	150	4500	500	5,000 /import	By berge	230kV / 700MW line available	Beside river	Too much resettlement
Bheramara	NWPGCL /IPPs	150	0	250-500	Domestic and import	By railway transportation (quite difficult)	230kV / 700MW line available	Beside river	Another PS (500MW) construction System stability difficult
Megnagatt #2&3	EGCB/IPPs	200-300	0	1,000-2,000	20,000 /import	By 5000ton berge (available)	400kV/700MW available	Beside river	Gas pipe line ready for #2&3, so gas based PS preferable
Mawa Upstream	EGCB/IPPs	300	10,000	2,000	20,000 /import	By berge (available)	Not available	Beside river	Flood control required
Mawa Downstream	EGCB/IPPs	300	0	2,000	20,000 /import	By berge (available)	Not available	Beside river	Permission from bridge authority
Chittagon	BPDB/IPPs	-	-	2,000	30,000 /import	By berge	230kV / 700MW available	Beside river	Permission from bridge authority
Cox Bazar	BPDB/IPPs	-	-	3,000	30,000 /import	By berge	-	Beside sea	Resettlement issues
Mongla	NWPGCL /IPPs	-	-	-	? /import	By berge	-	Beside sea	Environmental issues
Chandpur	PDB /EGCB	-	-	500	5,000 /import	By berge	-	Beside sea	Environmental issues (World Helitage)
Phulbari	NWPGCL /IPPs	-	-	-	?/domestic	-	Not enough	Beside river	Flood control
Karaspur	NWPGCL /IPPs	-	-	-	?/domestic	-	-	-	Timing of coal development
Diripara	NWPGCL/IPPs	-	-	-	?/domestic	-	-	-	Timing of coal development
Ruppur (nuclear)	AEC	-	0	800-1000	(Nuclear)	NA	-	Beside river	Timing of coal development
interconnection	-	-	-	-	(Hydro)	NA	-	-	AEC: Atomic Energy Commission
Renewable	-	-	-	-	(Renewable)	NA	-	-	Nepal, Bhutan preferable
									Review on JBIC's Renewable Study Report (Jan. 2006)

(DRAFT)  
SCOPE OF WORK  
FOR  
THE STUDY FOR  
MASTER PLAN ON COAL POWER DEVELOPMENT  
IN BANGLADESH  
AGREED UPON BETWEEN  
MINISTRY OF POWER, ENERGY AND MINERAL  
RESOURCES  
JAPAN INTERNATIONAL COOPERATION AGENCY

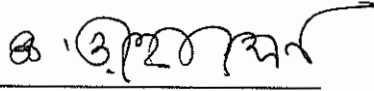
Dhaka, , 2009



---

Nobuko Kayashima  
Chief Representative  
Japan International Cooperation Agency,  
Bangladesh Office

---

Md. Musharraf Hossain Bhuiyan, ndc  
Additional Secretary  
Economic Relations Division  
Ministry of Finance

  
Mohammad Wahid Hossain, ndc  
Joint Secretary (Administration)  
Power Division  
Ministry of Power, Energy and Mineral  
Resources

  ৳

## 1. INTRODUCTION

In response to the request of the Government of People's Republic of Bangladesh (hereinafter referred to as "the Government of Bangladesh"), the Government of Japan decided to conduct the Study for Master Plan on Coal Power Development (hereinafter referred to as "the Study").

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan, will jointly undertake the Study in close cooperation to the authorities concerned of the Government of Bangladesh.

The present document sets forth the Scope of Work with regard to the Study.

## 2. OBJECTIVES OF THE STUDY

The main objective of the Study is to formulate the Coal Power Development Master Plan up to 2025 which shall be practical and comprehensive.

## 3. STUDY AREA

The Study will cover entire area of Bangladesh.

## 4. SCOPE OF THE STUDY

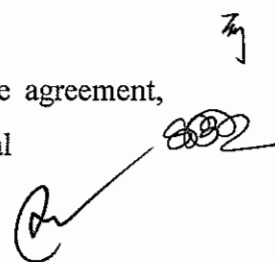
In order to achieve the objectives mentioned above, the scope of work for the Study shall cover the following items:

### 4.1 Data Collection and review on existed policies

- (1) Data Collection and Review
  - Collect and review the necessary data such as the existing power system data, the latest power system development plan, and the other relevant data.
- (2) Review on policies
  - Review on the policies such as energy policy, coal policy, renewable energy policy, etc.

### 4.2 Situation Analysis of primary energies for power in Bangladesh

- (1) Domestic coal usage
  - Review the coal mine activities and plans in Bangladesh
  - Study possibilities for domestic coal supply to the power sector
- (2) Imported coal usage
  - Study possibility for imported coal usage in the power sector
  - Compile business plan of imported coal usage such as purchase agreement, transportation scheme and evaluation of quality and quantity of coal





- (3) Other primary energy
- Study possibility for the other primary energy resources for power development such as gas, liquid fuel, renewable, nuclear energies, power purchase from neighboring countries, etc.

#### **4.3 Preparation of Power System Development Plan**

- (1) Demand Forecast
- Review power demand up to 2025 based on the PSMP (2005).
- (2) Power Development Plan
- Prepare power development plan up to 2025
  - Examine base scenario as well as alternative scenarios, considering various power sources such as coal power, gas power, nuclear power, renewable power, hydropower imported from neighboring countries (power grid interconnection), etc.
  - Identify generation types, capacities and specific project sites
- (3) Transmission Development Plan
- Prepare transmission/substation development plan up to 2025
- (4) Financial analysis
- Study on cost analysis and financing strategies

#### **4.4 Selection of high priority-potential projects**

- Make short list on high priority-potential projects in terms of technical, environmental/social issues which follow the Government of Bangladesh and JICA guidelines and cost analysis.

#### **4.5 Workshop**

Disseminated seminar will be held occasionally during study period. Technical workshop will be held at the occasions of Draft Final reporting.

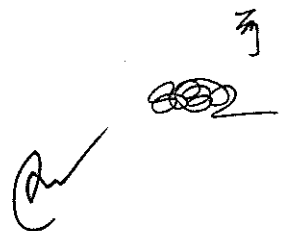
### **5. STUDY SCHEDULE**

The Study will be carried out in accordance with the Tentative Study Schedule as attached in the Appendix. The schedule is tentative and subject to modification when both parties agree upon any necessity that may arise during the course of the Study.

### **6. REPORTS**

JICA shall prepare and submit following reports in English to the Government of Bangladesh through the Ministry of Power, Energy and Mineral Resources (hereinafter referred to as "MPEMR").

- (1) Inception Report:  
Ten (10) copies of English version



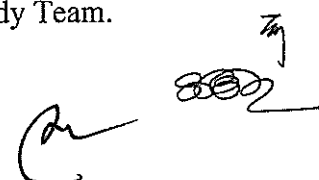
- (2) Interim Report:  
Ten (10) copies of English version
- (3) Draft Final Report:  
Twenty (20) copies of English version

MPEMR shall provide its comments on behalf of the Government of Bangladesh within one month after the receipt of the Draft Final Report.

- (4) Final Report:  
Thirty (30) copies of English version will be submitted within six weeks after the receipt of the comments on the Draft Final Report.

## 7. UNDERTAKINGS OF GOVERNMENT OF BANGLADESH

- (1) In order to facilitate the smooth conduct of the Study, the Government of Bangladesh shall take necessary measures:
  - a) to permit the members of the JICA Study Team to enter, leave and sojourn in Bangladesh for the duration of their assignments therein, and exempt the members of the JICA Study Team from foreign registration requirements and consular fees;
  - b) to exempt the members of the JICA Study Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of Bangladesh for the conduct of the Study;
  - c) to exempt the members of the JICA Study Team from income taxes and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the JICA Study Team for their services in connection with the implementation of the Study;
  - d) to provide necessary facilities to the JICA Study Team for remittances as well as for the utilization of funds introduced into Bangladesh from Japan in connection with the implementation of the Study;
  - e) to facilitate prompt clearance through customs and inland transportation of equipment, materials and supplies required for the Study and of the personal effects of the members of the JICA Study Team.
- (2) The Government of Bangladesh shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the JICA Study Team.
- (3) Ministry of Power, Energy and Mineral Resources (MPEMR) shall be the responsible organization for the Study and also the coordinating body in relations with the other governmental and non-governmental organizations concerned for the smooth implementation of the Study. Power Cell/BPDB shall act as the counterpart agency to the JICA Study Team.



(4) MPEMR, at its own expense, provides the JICA Study Team with the following, in cooperation with other organizations concerned.

- a) security-related information on as well as measures to ensure the safety of the Japanese study team,
- b) information on as well as support in obtaining medical services,
- c) available data (including maps and photographs) and information related to the study,
- d) counterpart personnel,
- e) suitable office space with necessary equipment and facilities in Dhaka,
- f) credentials or identification cards, and
- g) communication facilities such as telephone, facsimile, E-mail, if necessary.

## 8. EFFECTUATION OF SCOPE OF WORK

Scope of Work of the Study will come into effect after completing necessary arrangement between JICA and the Government of Bangladesh.

## 9. CONSULTATION

JICA and MPEMR will consult with each other in respect of any matter that may arise from or in connection with the Study.

:END

Appendix : Tentative Study Schedule

Handwritten signature and stamp. The signature is a cursive 'Cm' followed by a horizontal line. To the right is a circular stamp with illegible text inside, and a small mark above it.

APPENDIX  
Tentative Study Schedule

Study Content	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Data Collection and Review Existing Policies	■														
2. Situation Analysis on Coal Development		■													
3. Situation Analysis on Primary Energy Balance			■												
4. Study of potential power station sites				■											
5. Preparation of Optimal Plan								■							
6. Selection of Potential Sites									■						
7. Environmental and Social Considerations										■					
Report	△	△						△	△				△	△	△
Workshop and Seminar		△						△	△	2nd Seminar			△	△	Workshop

Note

■ Working period

△ Ic/R: Inception Report

△ F/R: Final Report

△ It/R: Interim Report

△ Df/R: Draft Final Report

WS: Workshop

4. 面談議事録

面談議事録

日時：	2009年2月18日 11:30～12:50	
相手国機関：	MPEMR	
場所：	MPEMR	
出席者	MPEMR	Nasirudiin Ahmed 次官ほか
	調査団	前原総括、実川団員、遠藤団員、庄司団員 鈴木所員、鈴木専門家、Zaki 所員
	その他	
協議内容		
<p>バングラデシュ側 Nasirudiin 次官の主な発言は以下のとおり。</p> <ul style="list-style-type: none"> <li>・電気はバングラデシュで非常に重要な役割をもっており、JICA が発電事業を支援していることに感謝したい。</li> <li>・ Coal Policy の内容についてはのちほど Energy division から説明する。</li> <li>・ 2020 年までにすべての国民に電気を供給することが開発目標である。</li> <li>・ バラプクリア炭鉱の現在の出炭量では、125MW の発電所への供給が精一杯で、400～500MW 級の発電所には石炭は供給できないし、計画もない。</li> <li>・ 石炭開発のスケジュールはのちほどわたす。</li> <li>・ 輸入炭の荷揚げ港としては Chittagong がよいと考える。</li> <li>・ 新たな炭田開発に向けて豪州の会社が探査を始めている。</li> <li>・ バラプクリアの 125MW 火力発電所増設について、今後の新規電源としてマスタープランに組み入れてほしい。F/S、石炭確保への方策などは検討済みである。</li> <li>・ 支援内容について、目標年次の 2025 年を 2020 年にしてほしい。</li> <li>・ 2025 年には国内炭 4 万 t/日・輸入炭 6 万 t/日が必要。</li> <li>・ バラプクリア火力発電所 125MW 増設に対する支援はすぐに行ってほしい（調査団より：必要性についてはマスタープラン調査のなかで検討する予定だが、低効率発電に対する支援は行わない旨回答）。</li> <li>・ カウンターパートは Energy Division と Power Division の数名からなる。</li> <li>・ SW の Signer はあとで知らせる。</li> </ul> <p style="text-align: right;">以上</p>		

## 出席者リスト

No	Name	Designation, and Organization
1	Nasirudiin Ahmed	Secretary, MoPEMR
2	Mohammad Wahid Hossain	Joint Secretary-Admin, Power Division
3	Syed Mahbubur Rahman	Asst. Chief, Power Division
4	Md. Nazrul Islam	Deputy Chief, Power Division
5	Md. Nurul Islam	Deputy Secretary, EMRD (Energy and Mineral Resources Division)
6	Mohammad Abdul Jalil	MD, Power Cell
7	Md. Mizanur Rahman	Power Cell
8	Meer Abdul Matin	GM, BCMCL (Barapukuria Coal Mining Co. Ltd.)
9	Khurshidul Hasan	MD, BCMCL
10	Showkat Hossain	Chairman, BPDB (Bangladesh Power Development Board)
11	Noor Muhammad Bhuiyan	SDE-System Planning, BPDB
12	A.K. Mahmud	Deputy Director, System Planning Directorate, BPDB
13	Santi Ram Roy	Director- Technical, EGCB (Electricity Generation Company of Bangladesh)
14	Ibrahim Shafi	Manager, EGCB
15	AHM Murtaza Ali	MD, EGCB
16	Md. Nazim Uddin	GM, Planning & Design, PGCB (Power Grid Company of Bangladesh)
17	Arun Kumar Saha	Manager-System Planning, PGCB
18	M. Yousuf A. Talukder	Director-Operations, Petrobangla
19	A. M. Khurshidul Alam	MD, NWPGL (North-West Power Generation Co., Ltd.)
20	Mitsuhiro Maehara	Team Leader, JICA Preparatory Study Team
21	Koji Jitsukawa	JICA Preparatory Study Team
22	Hajime Endo	JICA Preparatory Study Team
23	Takeo Shoji	JICA Preparatory Study Team
24	S. Suzuki	JICA Expert
25	M. Suzuki	JICA Dhaka Office
26	Zaki Md. Ziaul Islam	Program Officer, JICA BD

## 面談議事録

日時：	2009年2月18日 15:40～16:45	
相手国機関：	ペトロバングラ	
場所：	ペトロバングラ	
出席者	ペトロバングラ	次ページ参照
	調査団	前原総括、実川団員、遠藤団員、庄司団員 鈴木専門家、Zaki 所員
	その他	
協議内容		
<ol style="list-style-type: none"> <li>1. Coal Policy は Energy Division にて作成、政府内部で承認作業中。</li> <li>2. バラプクリア炭鉱開発は mining lease (採鉱権) と mining license (鉱業権) を取得して操業中。</li> <li>3. ディヒパラは探査権を取得したところ。</li> <li>4. フルバリは mining license をまだ取得していない。初期の開発を行った Asia Energy は撤退し、その後 Global Coal Management が継承したが、その後の活動は不明。</li> <li>5. ペトロバングラはオイルと違って石炭の輸入についての独占権を国から付与されていない。したがって石炭の輸入は誰でもできる。</li> <li>6. 輸入炭による発電所建設地は Chittagong がよいと思われる。</li> <li>7. 石炭開発を U/G (Underground) か O/C (Open Cut) かは環境社会配慮の観点から sensitive な対応が求められる。</li> <li>8. 石炭火力発電所のマスタープランに加え炭鉱開発のマスタープラン作成も併せて支援してほしい。</li> <li>9. バラプクリアは増産体制に入っており、採掘切羽設備を更に 1 ユニット導入する予定で、150 万 t 生産体制をつくっている。現在、Top Caving 採掘法 (中国で実用化された高層採炭技術だが、自然発火等の課題がある) を検討中。</li> <li>10. その結果、バラプクリアに 125MW の発電所を増設が可能となる。150MW でも可能だが、これを円借案件として支援をお願いしているところ。</li> <li>11. 石炭需要は 3 倍 (需要 350 万 t/年に対して生産 100 万 t/年のみ) あり、バラプクリア炭の輸出は考えられない。</li> <li>12. 現在の技術では 2025 年までにはバングラデシュ全体で 2 万 5,000t/日が精一杯。</li> <li>13. 4,000MW の石炭火力に 4 万 t/d の石炭が必要ならば、現段階では輸入炭を検討すべきと考える。</li> <li>14. バラプクリア炭鉱拡張に伴う地表沈下対策に係る技術協力を日本にお願いすべく、1 ヶ月前にバングラデシュ政府宛て要請書を提出したところ。</li> <li>15. 反対運動の起こったフルバリへ踏査に行くことは、全く問題ない。</li> <li>16. ADB の TA にてバングラデシュ側で策定しているはずと調査団の説明するところの、国家住民移転ポリシーについては全く知らない。</li> </ol>		
以上		

## 出席者リスト

No.	Name	Title
1	Jalal Ahmed	Chairman, Petrobangla
2	Eng. Moazzem Hossain	Deputy General Manager, Mine Operation, Petrobangla
3	Kh. Md. Abdul Bari	Deputy General Manager, Mine Operation, Petrobangla
4	Eng. D.M Zakbayed Hossain	Manager, Mine Operation, Petrobangla
5	Moue Md. Mobibul Hassain	Planning, Petrobangla
6	Merlnya Ahmad Fargue	General Manager, Planning and Maintaining, Petrobangla
7	Meer Abdul Matin	General Manager, Barapukuria Coal Mining Co.,Ltd.
8	Kurshidul Hasan	Manager Director, Barapukuria Coal Mining Co.,Ltd.
9	Mitsuhiro Maehara	Team Leader, JICA Preparatory Study Team
10	Koji Jitsukawa	JICA Preparatory Study Team
11	Hajime Endo	JICA Preparatory Study Team
12	Takeo Shoji	JICA Preparatory Study Team
13	S. Suzuki	JICA Expert
14	Zaki Md. Ziaul Islam	Program Officer, JICA BD



## 面談議事録

日時：	2009年2月19日 10:30～12:30	
相手国機関：	Power Cell	
場所：	Power Cell	
出席者	Power Cell	以下参照
	調査団	前原総括、実川団員、遠藤団員、庄司団員 鈴木専門家、Zaki 所員
	その他	
協議内容		
<p>1. 調査団より新規発電所の候補地についての検討状況を質したところ、石炭火力を中心に、出力、地点、克服すべき課題とともに先方より添付のとおり提案があった。</p> <p style="text-align: right;">以上</p>		

## 出席者リスト

No.	Name	Title
1	Mohammad Abdul Jalil	Director General, Power Cell
2	Md. Ruhul Amin	MD, Power Grid Co.
3	Md. Mizanwe Rahman	Power Cell
4	Md. Tahir Mian	Director Technical, North-West Power Generation Co., Ltd.
5	Md. Nornzzaman	Director Finance, North-West Power Generation Co., Ltd.
6	Kamal Uddin Ahmed	North-West Power Generation CO., Ltd.
7	A. M. Khurshedul Atau	MD, North-West Power Generation CO., Ltd.
8	Arun Kumar Shar	Manager, System Planning, Power Grid Company of Bangladesh
9	Mitsuhiro Maehara	Team Leader, JICA Preparatory Study Team
10	Koji Jitsukawa	JICA Preparatory Study Team
11	Hajime Endo	JICA Preparatory Study Team
12	Takeo Shoji	JICA Preparatory Study Team
13	S. Suzuki	JICA Expert
14	Zaki Md. Ziaul Islam	Program Officer, JICA Dhaka Office

Name	Developer	Land, acre	Resettlement, persons	Capacity, MW	Coal (t/day)	Transportation	T/L,S/S	Water Resources	Others	Concern
Barakupuria	NW	200	0	1,000	10,000	By belt conveyor	230kV / 700MW line already available	20Km far away		Open pit/tunnel?
Unit 3	NW	0	0	125		ditto	ditto	Beside river	To Japan	Low efficiency
Khulna	NW	150	4500	500	5,000 imported		ditto	Beside river		
Bheramara	NW			250-500	Domestic and imported	By railway transportation (quite difficult)	ditto	Beside river		Another PS (500MW) construction System stability difficult
Megnagatt 2 & 3	EGCB	200-300	N/A	1,000-2,000	20,000 imported		400kV/700MW	Beside river		
Mawa Upstream	EGCB	300	10,000	2,000	20,000 imported	By berge (available)	Not available	Beside river		Flood control required Permission from bridge authority
Mawa Downstream	EGCB	300	0	2,000	20,000 imported					
Chittagon	PDB	under investigation		2,000	30,000 imported		230kV / 700MW line	Beside river		Environmental issues
Cox Bazar	-	-	-	3,000	-	-	-	-		Environmental issues
Mongla	NW	-	-	-	-	-	-	-		Not yet visited
Chandpur	PDB /EGCB	-	-	500	5,000 imported		Not enough			Flood control
Phulbari	?									
Karaspur	NW									Not visited

Name	Developer	Land, acre	Resset tlemnt, persons	Capacity, MW	Coal (t/day)	Transportation	T/L,S/S	Water Resources	Others	Concern
Diripara	NW									Not visited
Ruppur (nuclear)				800-1000						Not visited
interconnection					with Nepal, Bhutan					
Renewable										Review on JICA study, exsiting studies

## 面談議事録

日時：	2009年2月19日 12:45～13:15	
相手国機関：	Bangladesh Power Development Board (BPDB) 環境担当	
場所：	Power Cell	
出席者	BPDB	Mr. S. M. Zahid Hasan, Assistant Engineer, 450MW Bheramara CCPP Project
	調査団	庄司団員
	その他	
協議内容		
<ol style="list-style-type: none"> <li>1. 石炭火力発電所建設は Red Category Project であり、環境許可証を取得するために IEE 及び EIA 両方を実施することが必要である。</li> <li>2. 事業者は IEE を実施し、報告書に土地所有者からの許可証である Land Clearance、地方行政からの許可証である Non Objection Certificate を添付し管轄地区の Department of Environment Divisional Office に申請する。Divisional Office は Headquarter に裁可を受け事業者に意見書を添付し返答する（60日以内）。</li> <li>3. 意見書に基づき事業者は EIA を実施し報告書を Divisional Office に提出する。Divisional Office は HQ から裁可を受け事業者に返答する、すなわち Environmental Clearance を出す。</li> <li>4. IEE・EIA 報告書には、それぞれの段階のレベルに応じてフィージビリティ、操業工程概要、環境管理計画・特に排水・排煙処理対策、住民対策、住民協議について記さなければならない。</li> <li>5. Land Clearance は所有者が行政であれば所轄官庁の許可とする。所有者が私人であれば Local District Commission Office (DC) に申請し土地取得の代行を行ってもらおう。</li> <li>6. DC は申請があれば土地価格評価委員会（土地価格の決定）と住民移転委員会（各戸への補償総額の決定）を設置する。土地価格は土地登記所で調べ 50%割り増しして補償単価とする。</li> <li>7. 現在 ADB の支援で策定した国家住民移転政策を承認待ちである。この政策は、例えば送電線下での経済活動に制約を受けるものに対して補償を行うことを定める等住民配慮に篤い。</li> <li>8. 事業者は詳細設計を行い、建設工事を行い操業をする。このとき、Divisional Office は毎年モニタリングを行い環境管理計画書／環境基準を満たさない工事・操業に対して Environmental Clearance を取り消す場合がある。</li> <li>9. EIA 審査料として 50croos (5億タカ) 以上のプロジェクトは 1 Lakh (10万タカ) が必要である。その後モニタリング代として 2万5,000 タカが毎年必要である。</li> <li>10. DOE は格安で EIA のためにモニタリングを実施している。</li> </ol>		
以上		

## 面談議事録

日時：	2009年2月19日 14:00～14:20	
相手国機関：	Engineers Associated Limited	
場所：	Power Cell	
出席者	BPDB	Mr. Syed BAhar Uddin
	調査団	庄司団員
	その他	
協議内容		
<ol style="list-style-type: none"><li>1. 環境測定単価については決まったものはないとのことであった。</li><li>2. Engineers Associated Limited社のブローシャ、実施業務経験、技術者の経歴の資料を依頼した。</li><li>3. 本マスタープランにて実施されるべきIEEの実施内容及び価格見積りを依頼した。</li></ol>		
以上		

## 面談議事録

日時：	2009年2月22日 9:00～12:30	
相手国機関：	バラプクリア炭鉱坑内調査	
場所：	Barapukuria Coal Mining Company Limited (BCMCL)	
出席者	BCMCL	Mr. Habibudin Ahmed, DGM
	調査団	実川団員、遠藤団員、鈴木専門家、Zaki 所員
	その他	
協議内容		
<ol style="list-style-type: none"> <li>1. No.1104 切羽の撤退現場を調査。次期切羽は No.1114。</li> <li>2. 切羽の経過は No.1110 が自然発火で試掘中止、密閉後水を注入、2年後取り開け設備を回収後 No.1101→No.1106→No.1109→No.1103→No.1104 に至る。</li> <li>3. No. 1104 切羽仕様は炭層の最上部を稼行丈 3 m、切り面長：123m、稼行長：600m。切羽設備の自走枠支持力は 440t/枠 (1.5m 幅)、シヤラー (採炭機械) は 375kw (切削用) +132kw (油圧用) で 600t/hr で設計。</li> <li>4. 立坑の深さは GL+33m で全長は 293m。</li> <li>5. 排気量は 120 m<sup>3</sup>/sec と少ないがこれは、ガス発生量が少ないためであり、掘進切羽でも 0.1%以下とのことで、歴精炭炭鉱では極めて異例である。</li> <li>6. 排水量は約25m<sup>3</sup>/min と比較的多い。またこれは雨期、乾期の変動は少ないとのこと。</li> <li>7. 掘進速度は 5 m/shift。</li> <li>8. 稼働方 (Shift) は 3 交代と 4 交代があり、切羽の状況により稼働時間を調整している。</li> <li>9. 炭鉱の人員構成は合計 1,081 人、中国人 (事務関係 45 人を含む 280 人) の S/V の下、現地人への技術移転を行っており、契約は 2011 年まで。中国人の技術移転状況は不明だが、最近中国人と現地人とのトラブルが新聞の記事に出ていたのから推測するに、言葉の問題が課題と思われる。</li> <li>10. 坑内の状況は今回、切羽が稼働していないので、操業状況は不明だが、全体の設備状況はよく、又設備の保全もよいのが印象的。ただし、安全標語、保安用の表示、例えば退避路、危険を示す表示等が全くない (たまにあるのは中国語)。坑内の安全対策は今後の課題となろう。</li> </ol> <p style="text-align: right;">以上</p>		

## 面談議事録

日時：	2009年2月22日 10:15～11:15	
相手国機関：	Upazilla Nirbai Officer (UNO)	
場所：	Upazilla Nirbai Office, Parbatipur, Dinajpur	
出席者	UNO	Mr. Selim Abed
	調査団	前原総括、庄司団員
	その他	
協議内容		
<p>バラプクリア炭鉱開発（石炭火力発電所建設含む）に伴う環境社会配慮上の問題について意見交換を行った。結果は以下のとおり。</p> <ol style="list-style-type: none"> <li>1. 坑内掘りによる家屋のひび割れ・田畑の浸水等地盤沈下などの近隣住民への影響が最も深刻な問題である。被害を申し立てている村は Moupukur、Kalupara、Balarampur、Barapukuria 4村に住む 300～400 世帯である。今後の対策としてジャムナ橋建設のときのような International Standard に基づく以下のような補償が必要である。             <ol style="list-style-type: none"> <li>(1) 沈下エリア（坑内掘り計画エリア）の特定と補償（田畑への損害賠償・居住地買い上げ）</li> <li>(2) 直近に集団住民移転地の準備。移転地は学校・病院その他必要な社会的インフラは整備しておくことが求められる。この移転地のために2次的住民移転が発生するがその対策も講じておく</li> <li>(3) 農地を失う移転住民に仕事を与えること（炭鉱・発電所等での優先雇用）</li> <li>(4) 沈下した田畑の養殖魚池化</li> </ol> </li> <li>2. 炭鉱内については、事故対策の必要性（炭鉱労働者の酸欠対策、石炭の自然発火火災対策）が指摘される。</li> <li>3. 炭鉱及び発電所への取水、同排水処理についても深刻である。現在汲み上げた坑内水は2つの池で沈殿処理をしているのみで放流し、したがって Coal dust を多量に含み漁業・灌漑水として農業に影響を与えている。発電所のための地下水の過剰揚水のために周辺の地下水位が低下して生活用水・農業用水に支障を来している。</li> <li>4. その他、坑内掘りの地下からの騒音振動で悩まされている村は Zigagari、Patigrom、Bashpukur の3村である。今のところ大気汚染被害の報告はない（125MWの発電機＝煙突は2本のみ）。</li> </ol> <p style="text-align: right;">以上</p>		

## 面談議事録

日時：	2009年2月22日 16:00～17:30	
相手国機関：	Barapukuria Coal Mining Co., Ltd. (BCMCL)	
場所：	Meeting room	
出席者	BCMCL	次ページ参照
	調査団	前原総括、実川団員、遠藤団員、庄司団員、鈴木専門家、Zaki 所員
	その他	ペトロバングラ Mr. Md. Abdel Bami
協議内容		
<p>1. パワーポイントにて BCMCL の概況説明。地質、操業、投資、補償状況等の詳細が紹介されたが、全体のソフトコピーは入手できなかったため、一部を入手。</p> <p>2. バングラデシュの石炭埋蔵量として、          バラプクリア：390Mt、カラスピール：685Mt、フルバリ：572Mt、ジャマルゴンジ：1053Mt、          ディヒパラ：(200Mt) 合計 2,900Mt (Khalaspir が事前資料の 400Mt から増えている)。</p> <p>3. 石炭販売額は発電所向けは 2001 年 61.5US\$ が 2008 年 71.5US\$、その他の産業が 111.37US\$。</p> <p>4. 最近の出炭平均は 2,500～3,000t/d、最高出炭は 4,500t/d。揚炭設備（スキップ）の運搬能力は 3,300t/d。したがってこの能力が限界。稼働日は 365 日稼働で、最大でも年間 120 万 t が現設備の限界となる。昨年度（2007 年 9 月～2008 年 8 月）は 61 万 t で、2009 年 1 月までの 1 年間では 100 万 t 出炭している。</p> <p>5. 増産の見通し          現状設備では 1 Mt/y が限界で、将来 Top Caving 又は Sub Caving 採掘法を導入すると 1.5Mt/y 以上の増産が期待できるので、その場合には揚炭用新規立坑を建設予定。</p> <p>6. 現状出炭の見通し          現在 30～40m の炭層をロングウォールのスライシング法で採掘予定だが、金網による人口天盤方式は数年後、腐食によりダメになるとの予測で、現在天盤に石炭を残す採掘法を検討中。この方法だと採掘率が下がるが、人口天盤によるスライシングよりは確実な出炭が期待できる。しかしいずれにせよ、セカンドスライシング（予定は 2011 年以降）は現在よりも出炭は下がると思われる。</p> <p>7. バラプクリア発電所の 125MW 増設計画可能性は上記の理由で、1 Mt/y の安定出炭が確保できるかどうかで現在のところ不明と思われる。</p> <p>8. 環境問題</p> <ul style="list-style-type: none"> <li>・ 操業中の過去の事故として 7 名の死者を出した。</li> <li>・ 2006 年 5 月～2008 年 11 月の間に地盤沈下が複数の村で生じて、補償を行った。             <ol style="list-style-type: none"> <li>(1) 27 世帯の壁の亀裂発生に対して補償支払い TK83,000</li> <li>(2) 200 世帯の田畑の沈下浸水被害に対して補償支払い TK1,300,000</li> <li>(3) 7 世帯にブリキの家の新築 TK400,000</li> <li>(4) 道路の陥没の補修 TK660,000</li> </ol> </li> <li>・ 基本的にバラプクリア村民は移転することに合意している。</li> </ul>		



- ・ BCMCL は「バラブクリア村民住民移転・生計回復計画」のファイナンスをヨーロッパ投資銀行及び JICA に申し入れている。
- ・ 坑内排水は2つの沈殿池で処理している。放流水水質は定期的に検査しており、環境基準内である（有害物質については砒素について分析したとのことである）。
- ・ 排煙については分析していないが環境基準以下であると思われる（Dust）。

入手資料

- ①Annual Report, 2007-2008
- ②事前質問表の回答資料
- ③地質関係資料（パワーポイント）

以上

## 出席者リスト

No.	Name	Title
1	Kh. Md. Abdul Bari	Deputy General Manager, Petrobangla
2	Md. Shaiful Islam Sarkar	Manager, AP&S, BCMCL (BarapukuriaCoal Mining Co., Ltd.)
3	S.M. Nurul Aurangajeb	P.Eng. Deputy General Manger, Surface Operation, BCMCL
4	A.B.M.Kamruzzaman	Deputy General Manager, Geology, BCMCL
5	Habib Uddin Ahmed	Deputy General Manager, Underground Operation, BCMCL
6	Meer Abdul Matin	General Manager, Mining, BCMCL
7	Khurshidul Hasan	Managing Director, BCMCL
8	Khan Md. Zafor Sadie	Manager, Mining, BCMCL
9	Mitsuhiro Maehara	Team Leader, JICA Preparatory Study Team
10	Koji Jitsukawa	JICA Preparatory Study Team
11	Hajime Endo	JICA Preparatory Study Team
12	Takeo Shoji	JICA Preparatory Study Team
13	S. Suzuki	JICA Expert
14	Zaki Md. Ziaul Islam	Program Officer, JICA BD

## 面談議事録

日時：	2009年2月23日 16:00～17:00	
相手国機関：	Energy and Mineral Resource Division, MPEMR	
場所：	MPEMR	
出席者	MPEMR 他	次ページ参照
	調査団	前原総括、実川団員、遠藤団員、庄司団員 Zia ダッカ事務所員
	その他	
協議内容		
<ul style="list-style-type: none"> <li>・ Coal Policy は既に政府に提出済みで、現在 Cabinet の承認待ちの状態である。近々承認が降りる予定であるが、政府内の検討で論点になっているのは炭鉱開発方法（Mining Method）及び環境対策である。</li> <li>・ Power Division と Energy Division とのデマケについて、石炭火力発電所の建設、運営監督は Power Division、炭鉱開発は Energy Division となっている。</li> <li>・ マスタープランでは国内炭、輸入炭両方を活用する発電所建設計画を策定するという方向で検討してほしい。</li> <li>・ Power Division はバラブクリア発電所用の石炭をインドから輸入したことがあるが、これは Open Tender で実施した。量が少なかったため、Power Division が実施した。</li> <li>・ 今検討している Coal Policy では国内炭の開発を優先することが主眼となる。</li> <li>・ 発電所用の石炭の輸入 は Power Division のイニシアティブで行うことになる。</li> </ul>		
以上		

## 出席者リスト

No.	Name	Title
1	Dr. Md. Rafiqul Islam	Senior Assistant Chief, Power Division, MPEMR
2	Syed Mahbubur Rahman	Assistant Chief, Power Division, MPEMR
3	Molla Md. Mobirul Hossain	Director, Planning, Petrobangla
4	Md. Shafiqur Rahman	General manager, Strategic Planning, Petrobangla
5	Md. Abdur Razzaque	Deputy General Manager, Petrobangla
6	M. Yousuf A. Talukder	Director-Operations & Mines, Petrobangla
7	Md. Nehal Uddin	Director, GSB (Geological Survey of Bangladesh)
8	A.K. Mahmud	Deputy Director-System Planning, BPDB
9	Masum Al Beruni	Director, System Planning, BPDB
10	Md. Mizanur Rahman	Deputy Director, Power Cell
11	Arum Kumar Saha	Manager-System Planning, PGCB
12	Ibrahim Safi	Manager, EGCB
13	M.A. Hasnat	Deputy General Manager, EGCB
14	Meer Abdul Matin	General Manager, Mining, BCMCL
15	Engineer Anwar H. Khan	Director General, HCU (Hydro Carbon Unit)
16	Mitsuhiro Maehara	Team Leader, JICA Preparatory Study Team
17	Koji Jitsukawa	JICA Preparatory Study Team
18	Hajime Endo	JICA Preparatory Study Team
19	Takeo Shoji	JICA Preparatory Study Team
20	S. Suzuki	JICA Expert
21	Zaki Md. Ziaul Islam	Program Officer, JICA BD

## 面談議事録

日時：	2009年2月24日 14:30～15:00	
相手国機関：	Department of Environment (DOE) , Ministry of Environment & Forest (MOEF)	
場所：	MOEF	
出席者	DOE	Mr. Md. Shahjahan, Director (Technical) Mr. M.I.M. Shamme, Deputy Director (Technical)
	調査団	庄司団員
	その他	
協議内容		
<p>DOE との面談を通じて、IEE 及び EIA の関連手続きについて以下のとおり確認した。</p> <p>1. まず事業者は DOE に EIA の TOR 案を含む IEE 結果を提出する。DOE は 30 日以内にコメントをつけ返答する。環境対策が不十分であれば IEE の段階でプロジェクトを拒否される場合がある。IEE 報告書は、以下を含むこと。</p> <ul style="list-style-type: none"> <li>● プロジェクト及びサイト周辺の概要</li> <li>● 各サイトのスクリーニング (JICA ガイドラインの提案するすべての項目についてスクリーニングを行う)</li> <li>● 2次データ (既存データ) 収集。既存データがなければ1次データ収集すなわち現地測定を実施する。DOE は1次・2次データの収集に協力する</li> <li>● 上記に基づく環境影響の予測及び緩和策の策定</li> <li>● 選定されたサイトに対して実施する EIA の TOR 案</li> <li>● 概略ステークホルダー協議結果</li> <li>● 最有力候補地点の NOC (地方行政・住民代表の承諾書)</li> </ul> <p>2. 事業者は IEE 結果に基づいて EIA を実施する。EIA を実施し、必要な環境対策を策定し、その対策を実行に移す (例、排水処理施設を建設する)。必要な環境対策を備えた施設を完成させ操業準備が整えば DOE に環境認可 (操業開始認可) の申請書を提出する。そこで DOE は報告書・施設を検査し 30 日以内に操業開始許可を下す、あるいは拒否する。EIA 報告書は以下を含むこと。</p> <ul style="list-style-type: none"> <li>● プロジェクト及びサイト周辺の詳細</li> <li>● 最有力地点の詳細な環境影響評価・緩和策 (モニタリングの実施を含む) の提言</li> <li>● 住民移転計画書</li> <li>● 詳細ステークホルダー協議結果</li> </ul> <p>3. IEE は TOR のスコーピング作製のために実施するものであるが、同時に環境汚染を生じさせないような対策が立てられているかどうか判断しプロジェクトの可否材料の書類となることに留意する必要がある。</p>		

## 面談議事録

日時：	2009年2月25日 10:40～11:20	
相手国機関：	Ministry of Land (MOL)	
場所：	Ministry of Land	
出席者	MOL	Mr. Md. Aminur Rahman, Deputy Secretary
	調査団	遠藤団員、庄司団員
	その他	
協議内容		
<p>大規模開発による住民移転の現状と課題、今後の方針について以下のとおり聴取した。</p> <ul style="list-style-type: none"> <li>・ 住民移転に関する土地省の役割は、事業者が住民移転を計画実施するにあたって必要な法律をつくるといった側面支援である。</li> <li>・ ADBの支援で策定した国家住民移転対策ポリシーをMOLから内閣に提出したところ極めてマイナーな修正のために差し戻された。修正し1週間以内に再提出する予定である。数箇月後には承認されるであろうと見込んでいる。現時点ではポリシーは公開できないが2007年にドラフトとして作製されたものと全く変わらないとあってよい。</li> <li>・ ポリシーの内容は、ADBの住民移転ガイドラインに沿い、現行の法律では補償の対象とならない土地をもたないアルバイト農民（国民の50%を占める）やInformal Sector（不法占拠住民や小規模無許可商売者）も補償の対象となる。</li> <li>・ フルバリの騒動は、古くから住み着いている住民が今更、遠く離れた地に引越しし、今までに築かれた縁者・友人・地域社会のネットワークから外れたくないという思い（Sentimental emotion）に基づくものである（個人的意見と断りつき）。</li> <li>・ 大規模移転住民のために都市計画を立てるような法律は今のところない。</li> <li>・ 移転の基本は金銭補償しかあり得ない。ADBの勧める「代替地の提供」は、すべて開発され尽くしたバングラデシュでは不可能である。2次的な住民移転が発生する。したがって、今住んでいる土地面積が移転によって半分になってもやむをえないであろう。</li> <li>・ かといって移転にはモチベーションが必要である。その意味で水道・電気のない場所から、よりよい生活ができるような場所を用意するといった対策が必要である。</li> <li>・ 移転によって農地を失い、職を失う住民にはプロジェクト工事及び操業に優先的に雇用すべきである。</li> <li>・ 職業訓練のための費用も補償に加えるべきである。</li> </ul> <p style="text-align: right;">以上</p>		

