

**Document of  
The World Bank**

Report No: ICR88876

IMPLEMENTATION COMPLETION AND RESULTS REPORT  
(GUARANTEE NO. B-002-0-BD)

ON A

IDA PARTIAL RISK GUARANTEE

IN THE AMOUNT OF USD 60.90 MILLION

TO

AES HARIPUR (PRIVATE) LIMITED

FOR

HARIPUR POWER PROJECT

JUNE 24, 2014

Energy Unit  
Sustainable Development Department  
South Asia Region

CURRENCY EQUIVALENTS  
 (Exchange Rate Effective April 02, 2014)  
 Currency Unit = Bangladeshi Taka (BDT)  
 US\$ 1.00 = BDT 77.67

FISCAL YEAR [July 1 – June 31]

**ABBREVIATIONS AND ACRONYMS**

ADB	Asian Development Bank
AES	Applied Energy Services
BERC	Bangladesh Energy Regulatory Commission
BPDB	Bangladesh Power Development Board
CAS	Country Assistance Strategy
DESA	Dhaka Electricity Supply Authority
DESCO	Dhaka Electricity Supply Company
EGCB	Electricity Generation Company of Bangladesh
EIA	Environmental Impact Assessment
GDP	Gross Domestic Product
GoB	Government of Bangladesh
HDI	Human Development Index
HPL	Haripur Power Limited
IA	Indemnity Agreement
IDA	International Development Association
IPP	Independent Power Producer
LIBOR	London Inter-Bank Offered Rate
MCF	An abbreviation denoting a thousand cubic feet
MMSCFD	Million Standard Cubic Feet per Day
NEPC	New England Power Company
NWPGC	North West Power Generation Company
PGCB	Power Grid Company of Bangladesh
PRG	Partial Risk Guarantee
WZPDC	West Zone Power Distribution Company

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**BANGLADESH**  
**Haripur Power Project**

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## ICR DATA SHEET

### A. Basic Information

Country: Bangladesh	Project name: Haripur Power Project
Project ID: P065131	Guarantee Number: B-002-0-BD
ICR Date: 06/15/ 2014	ICR Type: Core
Guarantor: IDA	Guarantee Type: PRG
Borrower: Pendekar Energy Ltd	Beneficiary of Guarantee: Pendekar Energy Ltd
Original guarantee amount: US\$60.9ml	Revised guarantee amount: US\$60.9 ml
Environmental category: A-Full Assessment	Agent Bank: Standard Chartered Bank (SCB); UK
Implementing Agencies: Ministry of Industries; Bangladesh Power Development Board; and Titas Gas Transmission and Distribution Co.	
Co-financiers and Other External Partners: FMO	

### B. Key Dates

Process	Date	Process	Original Date	Revised/ Actual Date
Concept review:	01/07/ 1999			
Appraisal:	02/02/1999	Mid-term Review:	Nil	Nil
Guarantee Approval:	06/01/2000	Project Completion:	06/01/ 2001	12/01/ 2001
Guarantee Effectiveness:	04/04/ 2001	Guarantee Expiry:	12/31/2015	12/31/ 2015
Operation Committee Approval:	01/20/1999	First Drawdown:		

### C. Ratings Summary

C.1 Performance Rating by ICR	
Outcome:	Highly Satisfactory
Risk to Development Outcome:	Low
Bank Performance:	Highly Satisfactory
Borrower (of guaranteed loan)/ Implementing Entity Performance:	Highly Satisfactory
Government:	Satisfactory

C.2 Detailed Ratings of Bank, Borrower and Government Performance					
World Bank	Ratings	Borrower	Ratings	Government	Ratings
Quality at Entry:	Highly Satisfactory				
Quality of Supervision:	Highly Satisfactory				
<b>Overall Bank Performance:</b>	Highly Satisfactory	<b>Overall Borrower Performance:</b>	Highly Satisfactory	<b>Overall Government Performance</b>	Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Prob. Project at any time(Yes/No):	No	Quality at Entry (QEA):	NA
Problem Project at any time(Yes/No):	No	Quality of Supervision (QSA):	NA
DO rating before Closing/Inactive status:	Satisfactory		

#### D. Sector and Theme Codes

	Original	Actual
<b>Sector Code</b> (as % of total Bank financing)		
1. Power	99%	99%
2. Roads & Highways	1%	1%
	Original Priority	Actual Priority
<b>Theme Code</b> (Primary/Secondary)		
1. Infrastructure Services	20%	20%
2. Rural Services	29%	29%
3. Other Urban Design	28%	28%
4. Other Financial and Private	14%	14%

#### E. Bank Staff

Positions	At ICR	At Approval
Vice President:	Philippe Le Hou�rou	Mieko Nishimizu
Country Director:	Johannes Zutt	Frederick Thomas Temple
Sector Manager:	Julia Bucknall	Alastair J. McKechnie
Guarantee Manager:	Pankaj Gupta	Michel Wormser
Project Team Leader:	Mohammad Anis	Marc Heitner/S. Vijay Iyer
Guarantee Team Leader:	Ada Karina Izaguirre	Farida Mazhar
ICR Primary Author:	Aman Sachdeva (Consultant)	

#### F. Results Framework Analysis

##### Project Development Objective:

Increased power availability through low-cost private generation

**Revised Project Development Objective** (as approved by original approving authority): No revision

**(a) PDO Indicator(s)** – from Project Appraisal Document (Indicators entered from the ISR)  
Baseline Values from Project Outcome Indicators/Date of Value (from approval documents)

	Baseline Value	Original Target Values	Formally Revised Target Values	Actual Values Achieved at Completion
<b>PDO Indicator1:</b>				
Plant commissioned on time and to capacity; reduction in power shortages	Plant not commissioned; power shortages prevalent	Commissioning of plant in Dec 2001; Annual offtake of at least 2,100 Gwh	N.A.	Project commissioned in Dec 2001 and was able to reduce the power shortages by 360 MW; Avg annual offtake exceeding 2,500 Gwh per annum
Date achieved		Dec 01, 2001		
Comments	The project has fully achieved its original targets.			

**(b) Intermediate Outcome Indicator(s) - from Project Appraisal Document**  
 Baseline Values from Project Outcome Indicators/Date of Value (from approval documents)

	<b>Baseline Value</b>	<b>Original Target Values</b>	<b>Formally Revised Target Values</b>	<b>Actual Values Achieved at Completion</b>
<b>IO Indicator 1:</b>				
Financing and construction of the Haripur Power Plant	Financing not completed and construction didn't start;	Financial closure in June 2000; plant commissioned in June 2001	N.A.	Financial Closure in April 2001; Plant commissioned on December 1, 2001
Date achieved		05/03/2000		12/01/2001
Comments	The project has fully achieved its targets.			

**G. Ratings of Project Performance in ISRs**

<b>No.</b>	<b>Date ISR Archived</b>	<b>DO</b>	<b>IP</b>
1.	07/19/2006	S	S
2.	04/23/2007	S	S
3.	12/13/2008	S	S
4.	12/23/2011	S	S
5.	06/15/2012	S	S
6.	08/27/2013	S	S

**H. Restructuring (if any): There was no restructuring of the Project.**





## 1. Project Context, Development Objectives and Design

### 1.1 Context at Appraisal

1. At the time of the appraisal in the late 1990s, the macroeconomic situation in Bangladesh was stable while economic growth and social indicators had been improving for some time. However, economic growth was still too slow to reduce poverty substantially. Nearly 36% of the population remained below the poverty line for very poor and 53% below the poverty line for the poor. To further improve economic growth in the country, the Government's development goals included an enabling environment for faster, private-sector and export-led growth. However, weak public institutions and poor public services compromised private-sector oriented growth.

2. The power sector, for instance, was in a very precarious financial situation and unable to provide relatively reliable services to its limited customer base. The poor financial condition of the sector attributable to a combination of low tariffs, high losses (technical and non-technical losses amounted to 30% of net generation) and low level of bill recovery had prevented the utilities from operating in a financially sound manner and meeting the investment requirements of the sector. The sector had a total capacity of 3,100 MW with an available capacity of 2,400 MW. The country suffered from prolonged load shedding of up to 8 hours per day. In addition, power shortages prevented the expansion of electricity coverage beyond the existing low access level of around 15% of the population. Subsidies to government owned utilities amounted to roughly USD 300 million a year<sup>1</sup>. The World Bank (the "Bank") estimated that power shortages were constraining Bangladesh's gross domestic product (GDP) growth by 0.3 to 0.5 percent per annum.

3. The Government produced its vision for the sector under the "Policy Statement on Power Sector Reforms" of January 2000. Key features of the reform strategy were (i) unbundling of the sector into generation, transmission, and distribution; (ii) corporatization and commercialization of sector entities; (iii) creation of a regulatory agency; (iv) participation of private sector in generation and distribution; and (v) cost reflective tariffs; among others. While the reform included many good practices, it didn't provide a specific vision on how private sector participation would be increased in the sector. In addition, there were divergent views among stakeholders on implications of the increased private sector participation.

4. To address the prevailing power shortages in the country, the government had invited private investors in 1997 to bid for generation projects under a competitive and transparent bidding framework. Haripur was the first land based project awarded on a competitive basis to a private entity under this framework. The Project consisted of a 360 MW gas fired combined cycle power plant and was awarded to AES Corporation, USA, [through its Bangladesh subsidiary AES Haripur (Private) Limited] that had vast experience in development and operation of power projects in multiple countries. The project was part of the Government's least-cost power generation investment plan. With the commissioning of this project, it was expected that the project would serve as a reliable cost efficient source of power and contribute to reducing the country's shortages.

5. The perceived country risk of Bangladesh was high at that time and both international IPP developers and financial institutions were sceptical of Bangladesh's power sector due to its precarious financial situation and lack of experience with the IPP model of power project development. To provide comfort to the investors and the lenders on the ability of the country to fulfil its payment obligations under the Project, the GoB requested IDA for a Partial Risk Guarantee (PRG) to backstop the obligations

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<sup>1</sup> Project Appraisal Document (May 3, 2000), Haripur Power Project

of Bangladesh Power Development Board (BPDB) as off-taker and its obligations as stipulated in their contracts with AES in September 1998.

6. By making the risk profile acceptable to the lenders, the PRG aimed to provide the Haripur project with access to the largest commercial financing package in Bangladesh: US\$60.9 million with an overall term of 14 years, the longest tenure to that date for any non-concessional financing in the country.

7. The Project was fully consistent with the Country Assistance Strategy (CAS) at that time which supported the government strategy of a private sector driven economic growth in the power sector by committing to (a) facilitate private participation in new power projects through the IDA-supported Private Sector Infrastructure Development Fund, and IDA Guarantees; and (b) support the emergence of a privatized and competitive industry.

## **1.2 Original Project Development Objectives (PDO) and Key Indicators**

8. Two distinct versions of PDO were included in the PAD: (i) to enable Bangladesh to meet its power demand in a cost-effective manner (page 2), and (ii) to increase power availability through low cost private generation (Annex 1). This ICR uses the definition used in the Annex 1 of the PAD for the assessment in the ICR because it is more measurable than that in the PAD text itself and is does not depend on actions outside the scope of the project itself.

9. The indicators reported in Annex 1 of the PAD were: (i) Plant commissioned on time and to capacity; and (ii) Reduction in power shortages. The ICR has interpreted the second indicator as an absolute rather than a relative figure, i.e. whether or not the project added generation capacity rather than whether the gap between demand and generation was closed, since the growth in demand is outside the control of this project.

## **1.3 Revised PDO and Key Indicators, and reasons/justification**

10. There were no revisions made to the original PDO.

## **1.4 Main Beneficiaries**

11. The key beneficiaries of the Project were the electricity consumers as well as the potential consumer of electricity who, at the time of appraisal, were denied services on account of shortages of generation capacity. The Project was expected to generate substantial economic benefits to Bangladesh:

- a) When commissioned, it would help alleviate the power shortage, which was a major bottleneck to economic growth;
- b) It would generate estimated savings of about US\$28 million annually by displacing higher cost imported diesel fuelled projects (which also had adverse environmental implications).

## **1.5 Original Components**

12. The operation was for only one component i.e. financing, construction and operation of the Haripur Power Plant.

## **1.6 Revised Components**

13. There were no revisions to the project components.

## **1.7 Other significant changes**

14. There were no significant changes made to the Project design, scope and scale, implementation arrangements and schedule, and funding allocations from the ones approved originally. However, the ownership of the plant changed twice during the implementation phase: AES (original developer) sold its stake in the Plant to Globeleq, a subsidiary of the Commonwealth Development Corporation (CDC) of UK in 2005. Then Globeleq sold its stake to Pendekar Energy Sdn BHD of Malaysia in 2007. The terms and the scope of the IDA guarantee were not modified by the changes in ownership. IDA approved both transfers after careful technical and legal due diligence.

## **2. Key Factors Affecting Implementation and Outcomes**

### **2.1 Project Preparation, Design and Quality at Entry**

15. Haripur was Bangladesh's first land based IPP project to be awarded competitively to a private sector entity. Until the inception of the project, the country's power generation was primarily dependent on simple cycle generation technology. The gas-based combined cycle Haripur project was part of the least-cost power generation investment plan of the Government. The Bank's intervention became indispensable for the project owing to non-availability of adequate financing for the project. After the unsuccessful attempt by the promoters and IFC to secure financing, the Bank's PRG support was requested by the GoB. The Bank's appraisal of the project was comprehensive and covered the project related factors as well as the overall situation of Bangladesh's economy, power sector and the performance of GoB owned utilities whose obligations were to be covered through the IDA guarantee. The project was set against the context of a relatively stable macroeconomic framework and a favorable external debt situation at the time of preparation.

16. Besides the above, the Bank also incorporated certain safeguards in the project structure based on the experience from the projects financed by the Bank and other development agencies like Asian Development Bank (ADB), Japan Bank for International Cooperation (JBIC) and KfW. The overall operation encompassed multiple entities. A robust contractual structure ensured sound allocation of risks and responsibilities to these entities. Annex 9 discusses the contractual framework for the project in detail. Since this IPP would have imposed fixed obligations, denominated in foreign currency, the sector and macroeconomic risks were thoroughly analysed.

### **2.2 Implementation**

17. The Project achieved the Commercial Operation Date (COD) for combined cycle operation (360 MW) in December 01, 2001. Although the project was contractually obligated to declare COD only in combined cycle mode, the project supplied electricity to the grid on simple cycle (gas turbine only) between June 03, 2001 and October 31, 2001 at the request from the Government. The following issues were observed during the implementation of the project:

- a) Although the project met its contractual COD requirement, the delay in issuing certain consents and permits by different government agencies caused the project company to extend its COD date through the provisions in the Implementation Agreement (IA). The delays in issuing consents and permits were largely compensated by the early operation through simple cycle till combined cycle COD was achieved.
- b) The construction activities were at times disrupted due to the political situation in the country. Continuous strikes were called and movements to the construction site were restricted. This

impacted the implementation progress to some extent. However, at the request of the project company, the government provided a police escort during the key construction phases that helped staff movement and continuation of the activities at site.

- c) The GoB intended to create a level playing field between public and private sector power plants in terms of gas pricing. Therefore, the Gas Supply Agreement (GSA) signed between Haripur and Titas (the gas supply company owned by GoB) provided for a price as notified by the GoB for gas being supplied for electricity. However, initially there were issues regarding disparity between gas pricing for public generation projects and the Haripur IPP. Haripur IPP was billed by Titas at Taka 124/MCF vis-à-vis Taka 72.45/MCF for public generation plants. Haripur disputed this and continued to pay the gas bills at the rate of Taka 72.45/MCF as per the GSA. During Bank's initial supervision missions, the issue was raised at the highest level of the government and reflected in the mission AMs. The issue was later resolved in late 2006 by Titas billing Haripur at the same rate as for public generation projects.
- d) Contractually, Haripur was to receive gas on a first priority basis, and this obligation was respected by Titas during the plant's initial years of operation. However, from 2008 onwards the pressure at which gas was supplied was inadequate to enable the plant to use its full available capacity. This was attributable to Haripur's location towards the end of the pipeline, as other customers situated nearer to the source of gas received higher gas pressures and therefore were able to extract more gas. The situation worsened due to the general shortage of natural gas in the country. In August 2008, both BPDB and Petrobangla agreed to an intra-day gas rationing schedule which prioritised the supply of gas to power projects during evening peak. This made it difficult for the government to ensure adequate supply to Haripur.

### **2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization**

18. The Bank designed a comprehensive monitoring and evaluation plan to monitor the achievement of project development objectives. The indicators used by the Bank to monitor the operational performance of the project were generation, capacity factor, availability factor, net plant heat rate, dependable capacity as per the annual capacity test and revenues. In addition, the Bank diligently monitored the contractual performance of GoB (Indemnity Agreement) and its entities (Titas and BPDB). To monitor the achievement of CAS goals, the Bank maintained a regular dialogue with GoB to discuss the status of implementation of the reforms. The supervision was carried out by way of annual missions. Each of these implementation review missions was documented in Aide Memoires (AM) and ISR reports. Being a guarantee project, there was no disbursement for the project and the evaluation was conducted primarily for the identified risks covered under the PRG.

19. The likelihood of occurrence of events to increase the project's risks (forex convertibility, availability of gas, regular payments from BPDB, gas price equalisation) for a potential call on the PRG was highlighted in the Bank's internal and disclosable documents. As covered in section 2.2, Bank interventions were critical to avoid the occurrence of such events.

### **2.4 Safeguard and Fiduciary Compliance**

20. The project complied with all the Bank policies and procedures without any deviations or waivers. There have not been any qualified reports on Haripur's environmental compliance during implementation and operation phases.

21. At the time of appraisal, a detailed Environmental and Social Impact Assessment (EIA) was

completed which covered, in addition to the power plant, offsite structures such as access roads, transmission line and gas pipeline. This EIA report was released for public disclosure through the Bank's Public Information Centre and also at Haripur village and the project site. The resettlement action plans were prepared and implemented with full participation, cooperation and satisfaction of the affected people.

22. The project company required to address few additional social issues during implementation. An old memorial bridge had to be relocated to allow for the construction of the access road of the project. Also, the dredging activity to develop the site for construction of the power plant was identified to cause disruption of aquatic habitats, disruption of fishery resource, siltation effect in the river etc. The dredging then was abandoned at the start of the site development and the required soil for filling up the plant site was transported through water ways from other areas.

23. Since the project was a PRG, there were no financial management or disbursement issues.

### **2.5 Post-completion Operation/Next Phase**

24. The power purchase agreement was signed for a term of 22 years whereas the PRG provided by the Bank was for 14 years. BPDB continues to rely on GoB's budgetary support for meeting its payment obligations to Haripur. The government has increased tariff in different phases in the last three years which has brought down the subsidy requirement. The subsidy will decline further after the retirement of the rentals contracts and when other base load plants come online. The supply of gas to the plant has not been adequate of late and consequently, the plant has not been able to produce electricity up to its available capacity. It is expected that, being the least-cost electricity supplier, both BPDB and Titas will continue to fulfil their obligations towards the plant till the term of PPA and GSA.

## **3. Assessment of Outcomes**

25. At the time PRG for Haripur was approved, there was no Bank policy on PRG ICRs. This was clarified in December 2005 when OP/BP 14.25 was updated. According to the guideline, ICR for guarantee projects are required to be initiated two years after the COD. Therefore, the ICR for this project should have been written in December 2003. This was not initiated then because of the absence of policy guidance; the Bank sector team was not also keen on closing the project sooner as it provided a vehicle to continue the dialogue with the government on certain sector issues identified in the Project Agreements. The long period of Bank supervision has presented the opportunity to evaluate the overall impact of the guarantee on the project over a much longer period than would otherwise have been the case.

### **3.1 Relevance of Objectives, Design and Implementation**

26. The relevance of the PDO i.e. 'to increase power availability through low cost private-sector driven generation' to Bangladesh's country development priorities were high and continue to remain high in the current context as well. This was consistent with both the government's 'Policy Statement on Power Sector's Reform' of the year 2000 and the prevalent Bank's CAS in March, 1998 (and CAS progress discussed by the Board in July 1999) that emphasized the need for engaging the private sector in developing infrastructure. The project developed by AES has been able to meet the generation shortages prevalent in the country. The Haripur project also supported Bank efforts to improve the financial viability of the power sector in Bangladesh, both in terms of its cost structure and ability to increase electricity access to the poor. The PDO is very much in line with current CAS (FY11-15) goals, as captured in outcome 2.2 (increased infrastructure provision and access) and the associated indicator related to increased additional electricity production.

27. The design arrangement of the project was relevant and technically appropriate. The project’s design relied upon the cost effective gas-fired combined cycle technology power plant that was built, owned and operated by the private sector. This was the least cost design option for Bangladesh and its relevance is demonstrated by the high utilization over the years. The tariff offered by the plant is still amongst the lowest in the world. The PRG structure for the project primarily focused on the payment risk of BPDB and was highly instrumental in facilitating the necessary investments in the project.

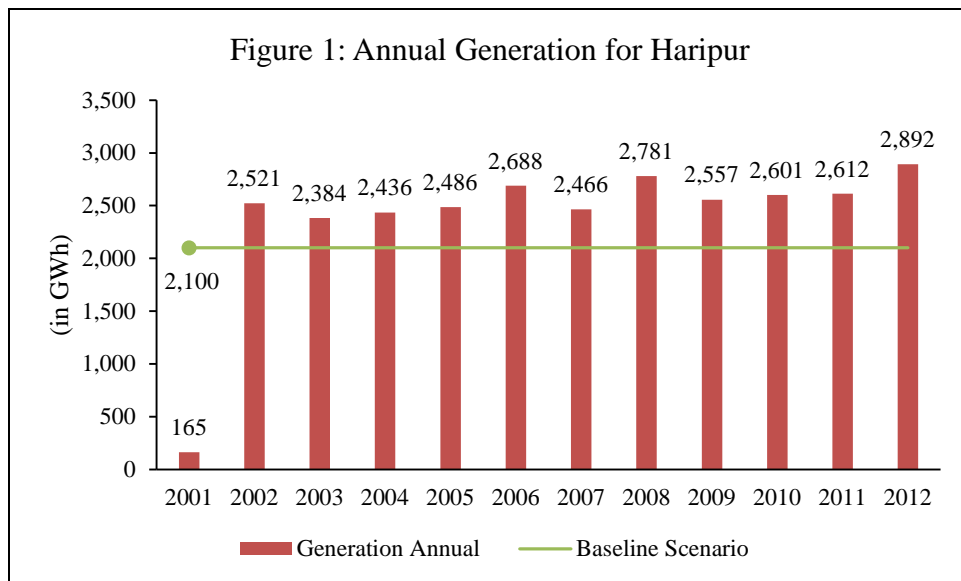
28. The project was implemented by AES, a global power company through a reputed EPC contractor which had vast experience in constructing large power plants in many different countries. Such implementation by a reputed private sector entity using international skills both in construction and development was also relevant to deliver the project on time and in terms of a transfer of knowledge and technical know-how.

### 3.2 Achievement of Project Development Objectives

29. As explained in section 1.2, the two indicators that have been analysed to assess the achievement of the PDO are: a) Increase in power supply; and b) Low cost of generation for power from Haripur.

#### a) Increase in power supply:

30. The budgeted values for the project at the time of appraisal assumed annual generation of 2,100 GWh per annum. The following figure shows the annual generation of the Haripur project since commissioning:



31. It can be observed that except for the year 2001 (in which the project was operational for only a month), Haripur has consistently generated more power than 2,100 GWh every year.

32. Besides meeting the generation targets, the project has also consistently passed all the capacity tests conducted periodically by exceeding the 360 MW mark as stipulated by the PPA. At the time of commissioning, Haripur contributed more than 10% of available capacity in Bangladesh, and as of 2013 the plant contributes around 4%. This shows that the plant has provided reliable base load capacity to Bangladesh.

**Table 1: Net Dependable Capacity Test Results**

		Net Dependable Capacity (MW)		
		Test	PPA	Test vs. PPA
Initial Test	29-Nov-01	363.8	360	1.10%
2 <sup>nd</sup>	22-Apr-03	362.46	360	0.70%
3 <sup>rd</sup>	10-May-04	366.29	360	1.70%
4 <sup>th</sup>	10-Mar-05	367.81	360	2.20%
5 <sup>th</sup>	14-Mar-06	364.53	360	1.30%
6 <sup>th</sup>	21-Mar-07	363.64	360	1.00%
7 <sup>th</sup>	11-Mar-08	363.53	360	1.00%
8 <sup>th</sup>	18-Jul-09	362.99	360	0.80%
9 <sup>th</sup>	27-Mar-10	361.95	360	0.50%
10 <sup>th</sup>	11-Jun-11	361.52	360	0.40%
11 <sup>th</sup>	01-May-12	361.01	360	0.30%

33. It can be concluded that Haripur was able to supply reliable electricity which in turn contributed towards increased power supply for Bangladesh.

b) Low cost of generation for power from Haripur

34. The combined cycle operations of Haripur Power Plant achieved commissioning on December 2001. The availability factor has averaged 92.40% (against 90% assumed in the calculations at the time of appraisal) since it began commercial operations. The plant is continuously producing at a heat rate which is lower than that stipulated in the PPA. While the PPA heat rate is used to calculate energy payments to Haripur, the actual heat rate is used to calculate the fuel payments to be made by Haripur. Because the project is producing at a lower heat rate as compared to the PPA heat rate, the differential between the two is a profit for Haripur. The various operational metrics and indicators as set out in Table 2 demonstrate that the plant is being operated very efficiently.

**Table 2: Operating Figures for the Project**

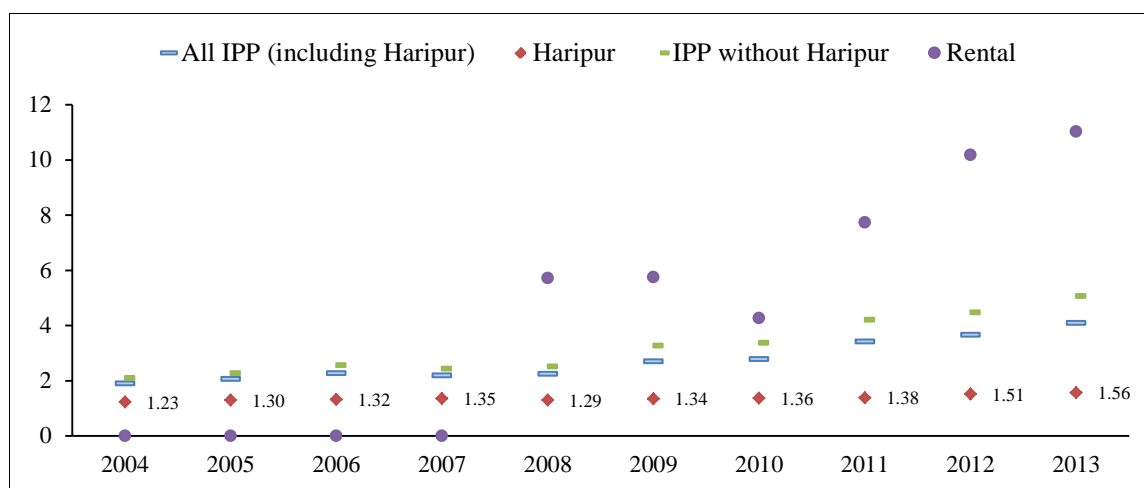
Year	Availability Factor (%)	Plant Capacity Factor (%)	Plant Utilization Factor	Generation Annual (mWh)	Actual Net Heat Rate		PPA Heat Rate	
					(kj/kWh)	(Btu/kWh)	(kj/kWh)	(Btu/kWh)
2001	87.00%	61.50%	70.70%	164,694	8,031	7,612		
2002	92.70%	80.00%	86.20%	2,521,334	7,593	7,197		
2003	92.20%	75.60%	82.00%	2,384,056	7,528	7,135		
2004	92.90%	77.00%	82.90%	2,435,678	7,539	7,146	7,486	7,095
2005	92.90%	78.80%	84.80%	2,486,156	7,429	7,041	7,507	7,115
2006	97.00%	85.20%	87.90%	2,688,068	7,368	6,984	7,412	7,025
2007	88.40%	78.20%	88.50%	2,466,159	7,383	6,998	7,465	7,075
2008	96.40%	87.90%	91.20%	2,780,738	7,229	6,852	7,396	7,010

Year	Availability Factor (%)	Plant Capacity Factor (%)	Plant Utilization Factor	Generation Annual (mWh)	Actual Net Heat Rate		PPA Heat Rate	
					(kj/kWh)	(Btu/kWh)	(kj/kWh)	(Btu/kWh)
2009	90.50%	81.10%	89.60%	2,557,200	7,098	6,728	7,396	7,010
2010	91.50%	82.50%	90.10%	2,600,527	7,225	6,848	7,552	7,158
2011	96.60%	82.80%	85.70%	2,612,276	7,173	6,799	7,448	7,059
2012	88.50%	78.80%	89.00%	2,891,721	7,294	6,913	7,408	7,021

35. Table 3 and Figure 2 below illustrate the per-unit cost for electricity as paid by BPDB over the years to private producers. From the data, it can be inferred that Haripur has been amongst the most cost effective power projects operating in Bangladesh. The list of IPP projects over the years, with their dates of commissioning are as set out below:

**Table 3: IPP Purchases in 2012-13**

Project Name	Fuel	COD	Per unit purchase cost 2012-13 (Taka/kWh)
Khulna Power Company Limited	HFO	October, 1998	16.03
NEPC	HFO	June, 1999	20.20
Westmont	Gas	June, 1999	2.48
Haripur	Gas	December, 2001	1.56
Meghnaghat	Gas	November, 2002	2.33
Rural Power Company	Gas	July, 2007	3.23



**Figure 2: Per Unit Electricity Purchase Cost for BPDB (in Taka/kWh)**

36. The above analysis clearly shows that despite being in operation for more than 13 years, Haripur continues to be the lowest cost source of power for Bangladesh amongst all the IPPs currently in operation.

37. Based on the above considerations against the two indicators, the achievement of the development objectives is considered **fully achieved**.



### 3.3 Efficiency

38. The monetary benefits arising out of the project have been estimated through an opportunity cost analysis i.e., by estimating the cost incurred by BPDB for purchasing the same amount of electricity, had the Haripur project never been commissioned.

**Table 4: Opportunity Cost of Power Purchased from Haripur**

Year→	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
IPP Purchase Cost without Haripur	2.10	2.27	2.56	2.43	2.51	3.27	3.37	4.20	4.47	5.06
Purchase Cost from Haripur (Taka per kWh)	1.23	1.30	1.32	1.35	1.29	1.34	1.36	1.38	1.51	1.56
Difference	0.87	0.97	1.23	1.08	1.22	1.93	2.00	2.82	2.96	3.50
Purchases from Haripur (GWh)	2,480	2,382	2,564	2,536	2,753	2,585	2,675	2,610	2,602	2,527
Savings (Taka million)	2,170	2,322	3,166	2,750	3,371	4,990	5,358	7,371	7,705	8,845
Savings (USD million)	28	30	41	35	43	64	69	95	99	114

39. The opportunity cost analysis as set out in the table above indicates that annual savings to Bangladesh range from USD 28 million in 2004 to approximately USD 114 million by 2013. The opportunity cost has been assumed to be average IPP purchase cost (assuming Meghnaghat 1 was commissioned) without Haripur. The difference between the two has been multiplied by the annual electricity purchased from Haripur to arrive at the savings. Based on those estimates, Haripur has contributed to annual savings of at least USD 61.9 million between 2004 and 2013<sup>2</sup>. That is substantially higher than the annual saving estimated at appraisal (USD 28 million).

40. A revised economic analysis was also carried out in line with the methodology used in the PAD. The results of the analysis indicate a base case return of 30% as compared to 16% as calculated in the PAD. Returns are also calculated for five (5) different scenarios, with economic IRRs ranging from 27% to 34%. The substantial improvement is mainly attributable to a higher willingness to pay by consumers for electricity, thereby increasing the net benefits offered by the project to the economy. The detailed economic analysis is in Annex 3.

#### Assessment of the Guarantee in support of the Project

41. **Impact of the guarantee in mobilizing private sector financing.** Bangladesh had limited access to international funding because of its lack of credit worthiness. This implied the viable means of financing accessible for GoB were concessional financing facilities from various multilateral and bilateral sources. Given the limited allocation of developmental financing for the country, it was crucial that the project was able to raise commercial financing for a part of its loan requirement. The IDA PRG played a significant role in attracting commercial funding for the project by making the risk profile acceptable to lenders, and given the constraints faced by the country during the project preparation time, it is reasonable to assume that successful financial close would not have been achieved without the IDA PRG.

<sup>2</sup> Calculated using the IPP Purchase figures from BPDB annual reports

42. The PRG lowered the overall cost of financing (LIBOR+2%) which would otherwise have been passed on to the electricity consumers. It has been estimated that the margin for such a transaction, if financing was available at all, would have been in the range of 600 basis points<sup>3</sup>. The debt facility had a tenor of 14 years which was critical to the viability of the Project financing structure, given the very competitive tariff levels agreed under the PPA.

43. **Role and value of the guarantee in addressing critical risks and improving the overall sustainability of the transaction:** Majority of the risks covered by PRG relate to the performance of GoB or GoB owned implementing entities. Bangladesh lacked a track record of successful IPP projects and there were no published credit ratings for Bangladesh in 2001. These factors implied that lenders had very limited understanding of political risks associated with the investment in the country, and specifically in the power sector.

44. A World Bank guarantee helped participation of internationally renowned investors with significant experience in power project development and operations. This has ensured a project which is sound in all aspects and is consistently performing well. Most importantly, the government was also committed to the success of the project since the beginning. The contractual structure helped BPDB to honour its payment obligations to Haripur despite a severe deterioration of the sector finances and power crisis in the country. GOB also supported the structure and ensured that IPPs are paid by allocating adequate budgetary support to BPDB.

45. **Key issues or events that may arise in the future that could lead to a potential call on the guarantee:** The risks of a potential call on the guarantee is considered low at the time of ICR completion given that the PRG would expire in a year's time, and the remaining exposure amounts to only about US\$5 million. The principal risks that could lead to a call on the PRG are discussed below:

a) Unavailability of adequate BPDB cash flows

46. BPDB's weak financial situation carries payment risks for Haripur. The primary reason for this situation is that electricity tariffs are set at below cost. Secondly, due to delays in large base load generation projects coming online, BPDB has had to procure power from expensive and inefficient rental power projects. The GoB has taken steps to correct the situation by increasing tariffs seven times in the past three years. Nevertheless, BPDB's generation and bulk supply unit has suffered a loss of Taka 44 billion, Taka 62 billion and Taka 43 billion over the same period. The below-cost tariff has resulted in BPDB requiring budgetary support to maintain its payment obligations to private generators.

**Table 5: Budgetary Support provided by GoB to BPDB**

Year	Budgetary Support received from GoB		As % of BPDB's Annual Revenues
	(Taka billion)	USD million	
2007	3.00	39	6.05%
2008	6.00	77	10.73%
2009	10.07	130	15.83%
2010	9.94	128	13.97%
2011	40.00	515	49.02%
2012	63.57	818	52.97%
2013	44.06	567	26.10%

<sup>3</sup> Based on the author's transaction experience in the region.

47. As of 2013, BPDB owes Taka 176 billion to GoB against budgetary support received. New base load generation power plants are expected to come online in the next few years and are expected to progressively improve the financial situation at BPDB. As of now, BPDB remains dependent upon GoB for meeting its payment obligations to Haripur. The table 5 above shows the annual budgetary support provided to BPDB, and Table 2 in Annex 2 highlights some key financial indicators for BPDB.

b) Unavailability of adequate natural gas

48. Haripur is being given priority for supply of gas because of its efficiency and the priority accorded to the project in the gas supply contract. However, due to overall shortages in gas availability in the country, Haripur has suffered in the last few years. The GoB has accelerated gas exploration activities and has been focusing upon coal fired projects; however the impact of these initiatives remains to be seen. For a detailed discussion on the availability of gas, please refer to Annex 2.

c) Adequacy of foreign exchange availability

49. As per the PAD, an external debt service to export earnings percentage exceeding 20% would trigger an IDA intervention and require policy responses. This was made a covenant in the Indemnity Agreement to keep the foreign exchange exposure of GoB in check and to pre-empt possible foreign exchange shortages. The PAD estimated the payment obligations under the IPP programme would cause the percentage to increase from 10% to 12%. The Bank also ensured the implementation of a robust system to monitor the liabilities arising out of IPP projects for the GoB. The project has not faced any problems with the conversion of local currency to foreign exchange as Bangladesh's balance of payments situation has remained healthy over the years.

50. The first two risks described above were a major source of concern for the Project shareholders and lenders throughout the implementation phase and continued to be at the closing of the Project. The lack of sustained progress on improving the financial and operational performances of the power and gas sectors combined with the growing demand for their services have meant that the sector faces, at the closing of the Project, similar challenges to those faced at Project inception.

### **3.4 Justification of Overall Outcome Rating**

#### **Rating: Highly Satisfactory**

51. The project has significant positive aspects. These include: i) high relevance of development objectives and design with adequate guarantee framework to cover the risks of noncompliance of GOB obligations under the different project agreements; ii) the economic efficiency (strong economic IRR) of the investment, even after thirteen years of project operation; iii) efficient operations and maintenance of the plant, meeting the key indicators for its performance measurement; and iv) the project is delivering power at a very low tariff for BPDB. The entire operation also had a positive institutional development impact. Successfully implementing the least cost power option has remained highly relevant to government priorities throughout the period of project implementation.

### **3.5 Overarching Themes, Other Outcomes and Impacts**

**(a) Poverty Impact, Gender Aspects, and Social Development** NA.

#### **(b) Institutional Change/Strengthening**

52. The project facilitated a dialogue between the GoB and the Bank on sector's institutional

development. The Bank was able to offer its global expertise on power sector reforms to GoB. Several reforms were implemented, including partial restructuring of BPDB and DESA, setting up of an independent tariff regulator, power tariff rationalization, and equalisation of gas price for public as well as private sector projects. Ministry of Finance have also been monitoring the contingent liabilities in foreign currency generated by public sector entities' direct or indirect commitments to IPPs. This started as a response to the requirement of the Haripur PRG.

53. In addition to the establishment of a financing facility, the project also assisted Bangladesh with crafting transparent procurement procedures, regulatory frameworks, and risk-sharing mechanisms for private sector infrastructure promotion and operation. Both Power Cell and BPDB, entities responsible for large contract awards to private sector producers, later used the Haripur PPA, GSA, LSA and IA as model documents for RFP packages for new projects (with minor customization as needed). Lastly, the entire process of preparation, negotiation and agreements of the guarantee helped the GoB institutions to develop a thorough understanding of the nuances of structuring international project finance transactions.

#### **(c) Other Unintended Outcomes and Impacts (positive or negative)**

54. There were no other unintended outcomes and impacts.

### **3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops**

55. No beneficiary survey was carried out for the preparation of this ICR.

## **4. Assessment of Risk to Development Outcome**

### **Rating: Low**

56. Since, the ICR report for the Haripur project is being prepared thirteen years after COD and the guarantee for the project is about to expire, risk to development outcome has been rated **low**. The risk factors that could have hampered the achievement of this objective comprise of default in payment, unavailability of adequate gas for the project and delays in financial closure and commissioning. The risk pertaining to achievement of financial closure was mitigated by commitment from AES, IDA and other consortium lenders. The risk arising out of delay in project commissioning was addressed by entering into robust fixed price turnkey contractual agreements with the EPC contractor (Hyundai) with liquidated damages applicable for any delays in commissioning. BPDB never defaulted in payments under PPA. The adequate gas supply was ensured by entering into long term contractual agreement with Titas. In the course of plant operations, the issues faced on account of inadequate gas availability were resolved.

## **5. Assessment of Bank, Implementation Entity and Government Performance**

### **5.1 Bank Performance**

#### **(a) Quality at Entry**

### **Rating: Highly Satisfactory**

57. The project appraisal document was exhaustive with a detailed assessment of the alternatives, identified potential risks from all sources and incorporated social and environmental mitigation measures into project design. The Bank correctly targeted the issues with the Bangladesh's power sector and aimed to accelerate reforms by initiating consultative dialogue with the government. At the project level, the Bank clearly identified the potential issues arising out of gas supply and foreign exchange and ensured

that adequate mitigation mechanisms were in place. The Bank structured a comprehensive financing product with adequate coverage to provide comfort to the Lenders. A discrepancy has been observed in structuring of indicators against which the project's performance would be measured; however this discrepancy did not have a noticeable impact on quality at entry.

### **(b) Quality of Supervision**

#### **Rating: Highly Satisfactory**

58. Supervision of partial risk guarantees is expected to cover monitoring of the project's implementation, evaluative review and reporting, as well as assessment of the guarantee obligations. The Bank conducted well-staffed periodic supervision missions to review the construction progress of the Haripur project, its compliance to Bank's social and environment policies and guidelines and also BPDB's financial state to keep track of any potential trigger to call on the guarantee. The Bank also initiated dialogue with the concerned government authorities on policy reforms from time to time, building upon the covenants in the Indemnity Agreement. The performance reporting was brief and highlighted issues at hand in a succinct manner. With its timely intervention, the Bank ensured a smooth flow of operations for the Haripur project.

59. The discussion with the lenders and the sponsors continued to ensure a robust security structure of the project. Bank also monitored operational metrics like annual generation, capacity factor, availability, net plant heat rate and dependable capacity. Any variance with the budget numbers was analysed and highlighted for remedial steps. As described earlier, the Bank's intervention has been crucial in ensuring adequate gas supply for the project (Refer Para 18). The Bank also played critical role in indicating the need to equalize gas price as per the agreement between IDA and the Government. The focus on financial review was to ensure that Haripur received its payments on time. Further, the Bank intervened in the initial years to ensure that Haripur was charged for gas at the same rate as public plants in accordance with the Gas Supply Agreement (Refer Para 18).

### **(c) Justification of Rating for Overall Bank Performance**

#### **Rating: Highly Satisfactory**

60. Overall, Bank performance has been rated as Highly Satisfactory. The Bank took exposure in an underdeveloped market with very limited IPP development experience and successfully structured and closed an important transaction keeping in mind the interests of all the stakeholders. The guarantee risk coverage was comprehensive enough for international lenders to come on board. Risk mitigation measures adopted were also in line with international best practices.

61. The Bank has ensured smooth operations for the project through its proactive engagement with concerned parties. Any adverse issues that emerged during the project implementation and operations phase were diligently addressed by the Bank supervision staff. The relevant intervention by the Bank is well documented in the Bank system.

62. It is noted that there was no formal supervision mission during 2008-2011 and ISR reporting. However, that did not affect the project outcome. The Bank's team engaged in the energy program in the country was in contact with the Haripur plant staff periodically, and there was no major issue for which Bank's intervention was required. The project continued to perform well and in particular, there was no default from BPDB in making payments. Task leadership was transferred to Dhaka based staff in late 2011, after which supervision became regular, issues were dealt with and ISR reporting restarted. The

Bank's intervention in early 2012 that improved the gas supply situation at Haripur was highly appreciated by the Haripur plant management.

## **5.2 Implementation Entity Performance**

### **Rating: Highly Satisfactory**

63. Haripur Power Limited (HPL) is the implementation entity for this project. HPL's performance has been satisfactory on all fronts. They engaged an internationally renowned EPC contractor (Hyundai) for the project on lump-sum turnkey basis. As previously highlighted in Table 2, the owners have ensured that the Plant has adhered to availability, efficiency and delivered energy commitments without any deviation from the contractual agreements. The book keeping standards have also been up to the mark and have been signed off during statutory audits by experienced 3rd party auditors. Based on the site visit conducted, it has been observed that the site has been kept in very good condition. The plant experienced multiple changes in ownership. The performance of all these parties has been consistent. Multiple changes in ownership underpin the marketability of the asset as well.

64. This plant can be considered as one of the best practices in terms of environmental management with no environmental breach - spill or release, during the life of the project. Haripur plant is ISO 14001:2004 and OHSAS 18001:1999 certified. The commitment of the entity to comply with the safeguard standards has been exemplary.

## **5.3 Government Performance**

### **(a) Government Performance**

#### **Rating: Satisfactory**

65. The government, through its Ministry of Finance, has an Indemnity Agreement <sup>4</sup>(IA) with IDA. In this agreement, the government assured to take steps for any non-compliance of its implementing agencies involved in this project. The Government intervened to address non-compliance in a satisfactory manner: (i) as BPDB was unable to generate profits to meet payment commitments to Haripur, the Government provided budgetary transfers to BPDB so that the Board could meet its contractual obligations; (ii) Titas initially invoiced Haripur at a rate mentioned in the RFP document to be used for bid evaluation purpose for the IPPs. As this rate was higher than the rate at which public generation units were billed for natural gas and was in violation of the subsequent GSA signed between Haripur and Titas, the government intervened to resolve the issue and the gas price was equalized.

66. The government also committed in the IA to comply with several covenants to infuse sector discipline, to ensure prudence in further contracting of IPPs and to enable BPDB to purchase power generated by newly contracted IPPs. Several reforms were implemented, including partial restructuring of BPDB, setting up of BERC as regulator, power tariff rationalization, and equalisation of gas price for public as well as private sector projects and completing the financial restructuring plan. However, the three covenants relating to reporting to IDA under the IA are not fulfilled. These covenants include: (i) GoB to consult with the Bank before exceeding a total of 1780 MW of IPP capacity; (ii) BPDB to maintain a minimum debt service coverage ratio (DSCR) of 1.2 (this was considered as an indicator of BPDB's ability to meet IPP payments of 1780 MW); and (iii) GoB to report to IDA on an annual basis

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<sup>4</sup> Indemnity Agreement was signed between the Bank and GoB as a counter guarantee required by the Bank from the host government.

regarding its incremental contingent liabilities from the sector in relation to its overall forex reserves and ensure that external debt service ratio is kept below 20%. These covenants were introduced to keep GoB's liabilities to IPPs in check and reduce the overall risk for a call on the PRG.

67. Due to huge shortages in power generation, the government moved ahead with contracting further IPPs and rentals plants. The covenants (i) and (ii) were covered through regular budgetary transfer and therefore did not have any negative impact on payments to Haripur. With respect to (iii), government's external debt service ratio has always been well below 20% due to adequate foreign exchange reserve, but regular reporting to IDA was not observed. Although the government could have done better in terms of bringing more financial discipline in the sector through further reform and regularly monitoring the IA covenants, its non-compliance with the aforementioned covenants does not represent non-performance vis-à-vis the project.

#### **(b) Implementing Agencies' Performance**

##### **Rating: Satisfactory**

68. The key implementing agencies involved in the project are BPDB and Titas. BPDB signed the PPA with Haripur for purchase of power. Titas is responsible for supply of fuel to the project. The performance of both these entities had an important bearing on the daily operational performance of Haripur. BPDB's payment history to Haripur has been consistent, with the support of annual budgetary transfers from GoB. Although a payment of USD 1.4 million in the nature of penalty interest on delayed payments by BPDB still remains to be discharged, this issue falls outside the scope of the PRG (the Haripur management does not appear keen on pursuing it). Titas supplied gas consistently to the project up through 2010, when gas supply became an issue due to physical constraints in the gas transmission pipeline. Due to this, Haripur's capacity utilization often comes down to 60% even though its availability factor remains above 90%. The country's overall gas supply shortage had a bearing on Titas's inability to ensure required gas pressure at Haripur.

#### **(c) Justification of Rating for Overall Government Performance**

##### **Rating: Satisfactory**

69. GoB has ensured that gas is supplied and that Haripur is paid for electricity generation, although there have been instances where payments were delayed or gas supply was not adequate. Gas supply issue was resolved on an ad hoc basis as the Haripur management raised their concern at the top level engaging Bank staff in the discussion. There is, however, need for Titas management to continue prioritizing its gas supply to Haripur for higher capacity utilization because Haripur is the cheapest reliable source of electricity in the country. Since reform of the sector is not an objective of the project, the government's performance on reform during the project implementation period has not been evaluated negatively for the overall evaluation of the government performance. For the purposes of guarantee, regular payment to Haripur and supply of gas to the project were more critical. In both these aspects, government's commitment was satisfactory. Due to these reasons, even though there were lapses in compliance of a few covenants under the IA, a **Satisfactory** rating of the government's performance are well justified.

## **6. Lessons Learned**

70. The following aspects are considered major learning experiences from the project:
- a) If properly structured, it is possible to successfully implement a private sector project that brings private capital, private sector efficiencies, and first rated investors into an underdeveloped power sector such as that of Bangladesh in 2000 and reap substantial economic benefits for the sector. The Haripur transaction was structured keeping in mind the interests of all the stakeholders, and the project can be considered as successful in achieving its core objectives.
  - b) While project level interventions can lead to successful project outcomes, sector-wide changes require broader interventions and sustained commitment of key stakeholders. At the time of design, it was thought that the Haripur IPP would stimulate power sector reform in Bangladesh. However, project implementation shows that, while it can help accelerate dialogue about reform, one specific investment cannot alone generate sensitive policy reforms. In fact, the reform process slowed down over time mainly due to the lack of political will and strong resistance from the key stakeholders.
  - c) The Bank has a role to play in upstream project financial design to help improve project outcomes. These include: (i) providing government with guidance about workable financial structures and market expectations; and (ii) making more information available about the Bank's lending and guarantee instruments to member governments and potential private sector investors. The Bank did this successfully in the case of the Haripur Project. However, due to rotations within the civil service and evolution of the domestic private sector, knowledge about WBG's guarantee instruments may dissipate over time, so periodic outreach and dissemination to relevant entities about MIGA, IFC and Bank products should be organized.
  - d) Lastly, active monitoring risks covered under a Guarantee operation is critical to ensure timely resolution of emerging issues that start to affect the project negatively. Continued engagement by the Bank has brought positive results for the Haripur project. Therefore, future projects should allow for adequate monitoring and supervision during the life of the guarantee. Bank's portfolio monitoring system and operational portal should include guarantee projects, and the focus for such monitoring should extend beyond repayment history to include other intended benefits also.

## **7. Comments on Issues Raised by Implementation Entity/Implementing Agencies/Partners**

### **(a) Implementation Entity**

71. Haripur Power Limited, the project sponsor in its own ICR has raised the issue that once the Bank ceases its supervisory role or guarantee expires, it is expected that the compliance level of contractual covenants by the parties may deteriorate.

72. The ICR team is of the view that the government is committed to continue its payment record to Haripur and to provide gas as long as overall gas availability scenario in the country doesn't deteriorate.

### **(b) Government/Implementing Agencies:**

73. The GoB in its inputs has expressed appreciation for the huge success achieved by Haripur and the role played by the PRG instrument. However, they have highlighted the following reasons for non-replication of the structure for other projects:



- a) Lack of discussion on the PRG instrument and its success at the policy level due to limited dissemination of success story among policy makers;
- b) Limited capacity and financial exposure available with the line ministries and implementing agencies;
- c) Lack of institutional arrangement for identifying good candidate projects for the PRG;
- d) Lack of adequate orientation program on available Bank's lending instruments.

74. GoB would also like to see PRG facilities extended to other infrastructure projects which have strong commercial viability and potential interests of private sector engagement (such as deep sea-port, power plants, LNG terminals, airport construction, large bridges, and highways).

**(c) Lenders, Co-financiers and/or Co-Guarantors:** Lender's comment not received.

**(d) Other partners and stakeholders**  
(*e.g. NGOs/private sector/civil society*)

## Annex 1. Project Costs and Financing

### (a) Project Cost by Component (in USD Million equivalent)

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
EPC	124.0	124.0	100%
Other Construction	22.0	19.6	89%
Development Cost	8.0	8.0	100%
Contingencies	5.0	0.0	0%
Financing Cost	3.0	3.0	100%
IDC	12.0	12.0	100%
Debt Service Reserve Account	9.0	9.0	100%
<b>Total Cost</b>	<b>183.0</b>	<b>175.6</b>	<b>96%</b>

### (b) Financing

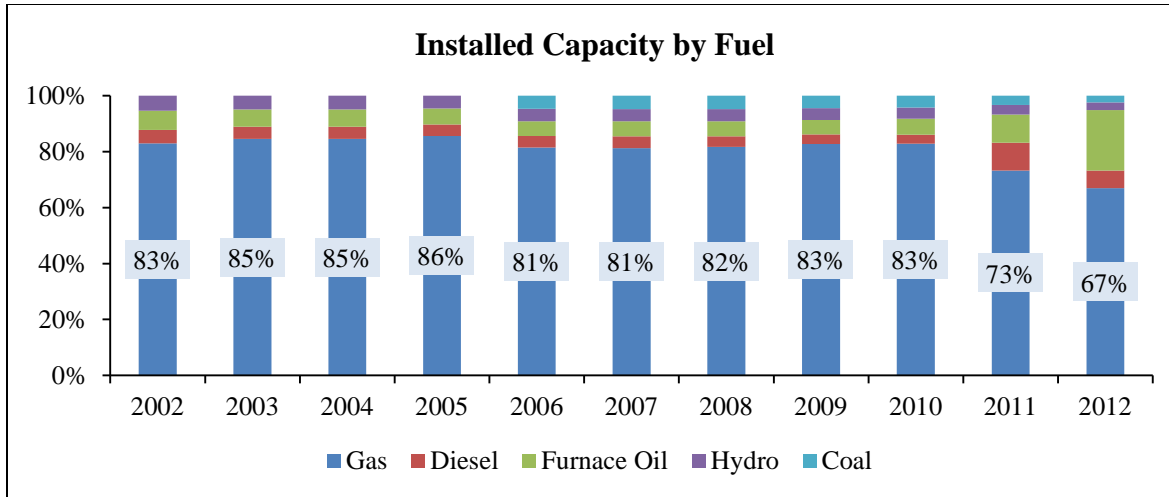
The total financing cost of the Project was US\$183 million during appraisal. The revised project cost came down to US\$175.6 million which was financed through a combination of equity, subordinated sponsor loan, and senior debt. The debt equity ratio of the Project was about 54:46. The equity component consists of 20% of base equity and the balance as subordinated sponsor loan. The senior debt consists of a commercial loan of US\$60.9 million supported by the IDA PRG and a US\$37 million Senior Sponsor Facility provided by AES Corporation. The IDA guaranteed commercial debt of US\$60.9 million has been underwritten by ANZ Investment Bank for a term of 14 years and is expected to be syndicated shortly to a group of international banks.

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Equity		76.7	73.7	96%
Senior Sponsor facility/FMO		37	37	100%
Subordinated Sponsor Loan		8.4	8.4	100%
IDA Guaranteed Commercial Loan		60.9	60.9	100%
<b>Total</b>		<b>183</b>	<b>175.6</b>	<b>96%</b>

## Annex 2: Outputs by Component

### Availability of Natural Gas

1. Bangladesh's Power Sector has always relied heavily upon natural gas for base load generation. The following chart provides a snapshot of the installed generation capacity fuel wise over the years:



2. In terms of share of natural gas in energy generation, the figure stands at more than 75% of the total energy generation. However, the production has not increased in line with increasing demand for natural gas. The following table gives the production and usage profile of natural gas in Bangladesh.

**Table 1: Bangladesh Production and Usage of Natural Gas**  
(in billion cubic feet)

Year	Production	Usage					
		Power	Fertilizer	Industry	Domestic	Commercial	CNG
2000-01	372.16	175.27	88.43	47.99	31.85	4.06	0.65
2001-02	391.53	190.03	78.78	53.56	36.74	4.25	0.73
2002-03	421.16	190.54	95.89	63.76	44.80	4.56	0.74
2003-04	451.92	231.43	92.80	46.49	49.22	4.83	2.94
2004-05	486.75	248.81	93.98	51.66	52.66	4.86	4.43
2005-06	526.92	273.25	89.08	63.26	56.74	5.20	17.59
2006-07	562.21	283.65	93.47	77.47	63.24	5.66	12.59
2007-08	600.86	314.50	78.66	92.19	69.02	6.59	23.52
2008-09	653.70	351.85	74.83	104.59	73.38	7.49	31.80
2009-10	703.00	395.73	64.71	118.80	80.20	8.11	38.91
2010-11	708.90	395.00	62.80	121.50	87.40	8.50	39.30

3. The production has almost doubled between 2001 and 2011; however, the demand has outpaced increased production. Forecasted demand for years 2014 and 2015 are 1.46 and 1.52 trillion cubic feet respectively (as per Petrobangla's estimates). This results in reduced gas supply for power projects and industries. Petrobangla (the official government owned Oil Company of Bangladesh) is unable to commit gas supply to new power plants and for 2012-13, 700-1000 MW of installed capacity was unable to generate power due to non-availability of gas. Power shortages compel the industrial units to set up smaller captive generation units, which are inefficient as compared to larger base load generation

power plants. These captive generation units are run using natural gas. This further aggravates the situation. The subsidised gas prices are promoting inefficient usage of natural gas. The GoB is planning to meet the shortfall by augmenting the existing production capacity. As per estimates by Petrobangla, between March 2013 and June 2016, an increase of 1,048 MMSCFD or 382.52 billion cubic feet per annum is expected. Furthermore, GoB has now started to diversify its fuel mix by putting in efforts into coal exploration. In addition, the GoB is also contemplating upon importing Liquefied Natural Gas (LNG) to meet the gas shortage in short term and which would also complement the well-developed pipeline network in the country.

4. To conclude, Haripur is being given priority for supply of gas because of its efficiency and the priority accorded in the gas supply contract. However, the situation for the economy remains grim vis-à-vis gas supply situation and the impact of government initiatives remains to be seen.

5. A weak financial situation at BPDB would mean enhanced payments risk for Haripur. The primary reason for the situation was the electricity tariffs being set at below cost. Secondly, the large base load generation projects could not come online as planned and BPDB had to procure power from expensive and inefficient rental power projects. The GoB has taken steps to overcome the situation by increasing tariffs seven times in the past three years. Therefore, it is expected that new base load generation power plants that are expected to come online will improve the financial situation at BPDB.

**Table 2: Financial Indicators for BPDB**

	<b>Return on Assets<sup>5</sup></b>	<b>Operating Ratio<sup>6</sup></b>	<b>Operating Cash Expenses to Cash Collection</b>	<b>Current Ratio<sup>7</sup></b>	<b>Loss (Taka Million)</b>
<b>2004</b>	2%	96%	82%	110%	(1,133)
<b>2005</b>	(4%)	107%	92%	105%	(6,086)
<b>2006</b>	(8%)	115%	103%	95%	(9,381)
<b>2007</b>	(5%)	114%	117%	92%	(9,041)
<b>2008</b>	(4%)	112%	104%	90%	(9,821)
<b>2009</b>	(4%)	110%	99%	92%	(8,286)
<b>2010</b>	(2%)	106%	98%	84%	(6,358)
<b>2011</b>	(25%)	151%	149%	92%	(46,206)
<b>2012</b>	(35%)	147%	140%	104%	(66,933)
<b>2013</b>	(15%)	122%	131%	85%	(50,438)

<sup>5</sup> Operating Income to Operating Average Fixed Assets

<sup>6</sup> Operating Expenses to Operating Revenue

<sup>7</sup> Current Assets to Current Liabilities

### Annex 3: Economic Analysis

1. The purpose of this analysis is to value the economic benefits of the electricity generated by Haripur project and compare that with the original EIRR estimation in the PAD which was 16%. The methodology compares the differences between the business as usual scenario and the scenario in which an intervention in the form of the project is made.

2. The following elements are considered in the analysis:

a) **Benefits:** At the time of appraisal, the benefits were measured by the consumer's willingness to pay (WTP) for electricity above the actual tariff. This was the only benefit considered under the benefits stream in the PAD. The base case analysis assumes that the WTP increases from Taka 4.66/kWh in the year 2001 to Taka 15/kWh in the year 2013 and then remains constant. The former is the average yield (billed retail sales) of the Rural Electricity Board in the year 2000 and the latter is the cost of liquid fuel powered rental power projects connected to the grid. This method does not differentiate between consumers with existing electricity connection and those without, for whom the WTP may be much higher. The upside case assumes the upper bound WTP at Taka 20/kWh and downside case assumes the same to be at Taka 12/kWh.

b) **Fuel Cost:** This measures the cost for the fuel consumed in generating power, however, valued not at the contractual rate (which is subsidized by the government) but at the market price of gas. The best available proxy for market price of gas in Bangladesh is the price at which India (one of Bangladesh's largest neighbours) imports gas. The earliest such contract was signed in 2004 between Qatar's RasGas and India's Petronet at USD 2.53/MMBtu with the price escalated to USD 3.12/MMBtu in 2009 implying a 23% escalation. For the purpose of this analysis, it has been assumed that since 2009 gas prices have been increased every 5 years at the same escalation rate.

c) **Operation and Maintenance Expenses:** These have been considered at the actual rate from Haripur's annual reports.

d) **Transmission and Distribution Charge:** This is levied to provide for the capital expenditure and O&M of the incremental transmission and distribution infrastructure. This is levied on the billed sales by adjusting energy generated for distribution system losses. Actual values for distribution system losses have been considered till 2013, after which the same has been assumed to remain constant. This has been assumed at the rate of USD 0.031/kWh.

3. Taking the above parameters into consideration, the base case Economic Rate of Return (EIRR) comes out to 30.18%. Additionally following scenarios have also been considered as part of the sensitivity analysis:

a) **Lower Utilization:** As has been pointed out in the report, there is a risk of plant not being utilized to the extent possible because of limited availability of gas. This may result in plant generating lesser electricity. Annual generation has been reduced by 10% from 2014 onwards.

b) **Higher WTP:** This assumes the upper bound of WTP at Taka 20/kWh

c) **Lower WTP:** This assumes the upper bound of WTP at Taka 12/kWh

d) **Gas prices increasing at 50% from 2014 onwards**

e) **Gas prices increasing at 12% from 2014 onwards**

**Table: EIRR Results**

<b>Case</b>	<b>EIRR</b>
Base Case	30.18%
Lower utilization	29.93%
Higher WTP	33.95%
Lower WTP	26.99%
Gas price increasing at 50%	30.01%
Gas price increasing at 12%	30.24%

4. In comparison with the 16% EIRR estimation in the original PAD, the above table shows that the Project has achieved a higher EIRR.

## Annex 4. Bank Lending and Implementation Support/Supervision Processes

### (a) Task Team members

Name	Title	Unit
<b>Preparation</b>		
Subramaniam V. Iyer	Director	SEG
Reidar Kvam	Senior Manager	CESPQ
A.S.M Basirul Huq	Senior Energy Specialist	SASDE
Farida Mazhar	Lead Financial Officer	SASDE
Md. Iqbal	Senior Energy Specialist	SASDE
Chrisantha Ratnayake	Senior Power Engineer	AFTG1
Raihan Elahi	Senior Energy Specialist	SASDE
Zafrul Islam	Lead Procurement Specialist	SARPS
Jitendra J. Shah	Lead Environmental Specialist	ECSEN
Chrisantha Ratnayake	Senior Power Engineer	CCGPT
Sameer Akbar	Senior Environmental Specialist	SARPS
Pankaj Gupta	Manager	TWIFS
Kevin William Casey	Lead Procurement Specialist	ECSOQ
Junxue Chu	Senior Finance Office	CTRLN
Thelma Rutledge	Program Assistant	
Anna Goodman	Program Assistant	ECSHD
Shaheda Karim	Program Assistant	SASDO
<b>Supervision</b>		
Midori Makino	Lead Evaluation Officer	IEGPS
Andres Londono	Senior Operations Officer	SASDE
Malcom Cosgrove-Davies	Sector Manager, Energy	LCSEG
Alan F. Townsend	Senior Energy Specialist	SASDE
Andrew S. Fitchie	Senior Counsel	
Pankaj Gupta	Manager	TWIFS
Penelope J Crooke	Sector Manager	SASDE
Farida Mazhar	Lead Financial Officer	TWIFS
Ada Karina Izaguirre	Infrastructure Specialist	TWIFS
Mohammad Anis	Senior Energy Specialist	SASDE
Jie Tang	Lead Energy Specialist	SASDE
Jitendra J. Shah	Lead Environmental Specialist	ECSEN
Raihan Elahi	Senior Energy Specialist	SASDE
Md. Iqbal	Senior Energy Specialist	SASDE
Zubair K.M. Sadeque	Senior Energy Specialist	SASDE
Mark L. Heitner	Lead Financial Analyst	SASDE
Mohua Mukharjee	Senior Energy Specialist	SASDE
Alastair J. Mckechnie	Director	SASDE
Shakil Ahmed Ferdousi	Senior Environment Specialist	SASDI
Md. Abul Fayez Khan	Program Assistant	EDS12
Tarak Chandra Sarker	Program Assistant	SASDO

**(b) Staff Time and Cost**

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	US\$ Thousands (including travel and consultant costs)
<b>Preparation</b>		
FY99	0.00	172.29
FY00	107.04	343.48
FY01	0.00	0.43
<b>Total:</b>	<b>107.04</b>	<b>516.20</b>
<b>Supervision</b>		
FY01	27.69	104.46
FY02	11.67	61.49
FY03	15.40	60.38
FY04	14.09	62.69
FY05	14.20	43.50
FY06	10.19	57.40
FY07	9.16	57.70
FY08	16.71	83.34
FY09	8.02	41.04
FY10	3.83	24.65
FY11	0.20	0.24
FY12	9.36	11.68
FY13	10.20	18.48
FY14	6.45	38.98
<b>Total:</b>	<b>30.04</b>	<b>666.03</b>



## **Annex 5: Beneficiary Survey Results**

No Beneficiary Survey was conducted under the project

## **Annex 6: Government of Bangladesh Input**

### ERD's (Economic Relations Department) Observation on Haripur Power Plant

In the year 2000, when power shortage was acute the World Bank Group's IDA Guaranteed Facility Agent came forward to give comfort to the lenders by providing PRG (Partial Risk Guarantee) for the HPL (Haripur Power Limited), led by Australia and New Zealand Banking Group Limited. And thus a 360 MW gas turbine Haripur Power Project was developed as built, owned and operated (BOO) by the private sector as an IPP which opened a new window of opportunity for channeling commercial financing in the power and infrastructure sector of Bangladesh.

With the Bank's PRG, it was possible for the sponsors of the HPL to have access the markets to mobilize funds on terms and conditions significantly better than it could had been on its own, including lower interest rate basis, repayment structure and maturity that match the project's requirements. The borrower's better financial term in mobilizing fund allowed the project to be implemented at a lesser cost and thus helped to offer lower tariff for power. The Bank's PRG also allowed participation from global reputed firms through a competitive bidding. However, this kind of PRG instrument proved to be efficient and least cost for Government of Bangladesh which was reflective in the lowest tariff offered by the project company in Bangladesh.

The sponsors of Haripur Power Project assumed commercial risks in the form of financing risk, project construction and design risks as well as operation & maintenance risks. The IDA PRG, on the other hand, provided guarantee to sponsors in the event of default by the government agency's failure to meet its payment obligations under the Project Agreement. IDA's PRG coverage also extends to breach of contract by government agencies, political force majeure events including expropriation, convertibility and transferability of foreign exchange or changes in law.

A long-term international commercial financing to a project was made possible for the first time in Bangladesh by the IDA PRG. This paved the way to the generation of affordable electricity for the people of Bangladesh. The PRG also provided cushion to the fiscal management as there was no financial engagement of the Government and the instrument offered comfort to foreign investment in Bangladesh, particularly in power sector.

Despite the huge successes of Haripur Power Project, the PRG instrument was not replicated in other projects. Though it is a matter of good research to figure out the reasons, some issues are apparent- the PRG instrument and its success were not much discussed in the policy level due to limited dissemination of success story among the policy makers, limited capacity and financial exposure of the line ministries and implementing agencies, missing of institutional arrangement for selecting good candidate projects, lack of adequate orientation program on available Bank's lending instruments. We should also consider such PRG facilities to extend in other infrastructure sectors like deep sea-port, power plants, LNG terminals, airport construction, large bridges, highways which have strong commercial viability and potential interests of private sector engagement.

## **Annex 7: Implementing Entity's Input**

### **Haripur Power Limited, the project sponsor's input**

#### **Introduction**

This report has been prepared as part of the Implementation Completion and Results (ICR) Report of the IDA Guarantee (B-002-0 BD) provided to lenders for the Haripur Power Limited, led by Australia and New Zealand Banking Group Limited, the IDA Guaranteed Facility Agent.

AES Corporation successfully developed the project and commenced its commercial operation in December 2001. Later on, after successful operation till 2005 the ownership of the plant was transferred to Globeleq, a subsidiary of the Commonwealth Development Corporation (CDC) of the UK. And after that in 2007 the ownership was again taken over by Pendekar Energy Sdn BHD of Malaysia.

#### **Financing of the Project**

The IDA PRG provided coverage for debt service default caused by contractual obligations of the Government of Bangladesh (GoB) under the Implementation and Guarantee Agreements entered into between the GoB and the Project Company, then the AES Haripur (Private) Limited (AESH) and which was later renamed as Haripur Power Limited (HPL).

This was the first time that such long-term international commercial financing had become available in Bangladesh. With the support of the World Bank, it paved the way to the generation of affordable electricity for the people of Bangladesh.

At one stage of the project financing development, when reliable progress could not be achieved in procuring finance from the conventional power sector financiers like the IFC, the project company was able to draw senior loan for the project from its parent company, AES Victoria Holdings, in addition to a subordinated sponsor loan and its equity contribution for the project, to comply with the financing time frame obligation from the project agreements. The subordinated sponsor loan was later (2003) taken over by FMO of Netherlands through bridge financing. The IDA Guarantee provided the ground for arrangement of Syndicated Commercial Loan for the project through lead arranger ANZ Investment Bank.

The Project started simple cycle operations in June 2001 and combined cycle operations in December 2001 at an electricity tariff below US\$.03/kWh which was amongst the lowest offered to date by an IPP internationally.

#### **Objectives of the Project**

The objectives of the project were (a) to enable Bangladesh to meet its power demand in a cost-effective and reliable manner; (b) to mobilize private sector financing for the power generation; and (c) generate savings by displacing less efficient plants running on imported liquid fuel.

#### **Assessment of Outcome**

##### **Achievement of the Objectives**

1. When AES Haripur (Private) Limited (AESH) signed the Implementation Agreement with the GoB on 17 September 1998 to set up a 360 MW Combined Cycle Power Plant the country was faced with

acute power shortage. The estimated requirement was almost 50% more than the generation capacity. AESH was set to provide reliable and clean power at a tariff that was the lowest offered by any IPP at that time in the subcontinent. Being one of the largest power generation company in the world at that time, AESH brought along its vast experience and expertise in the power sector of the country and which ensured reliable power from its power plant to be set up. Under the PRG, AESH also could arrange cost effective finance for the project. So, we feel that this objective was fully met.

2. Having the IDA Guarantee for the Project enabled the Project Company to approach for private sector financing for the project. So this objective was also achieved. The AESH project was the first case of international financing to any power generation project in the private sector in Bangladesh.

3. The project was designed and developed to use indigenous natural gas as the only fuel. For being developed based on combined cycle generation technology, the plant was capable to generate electricity making the optimum use of the countries natural resource. Dependency of the country on imported liquid fuel for power generation was significantly alleviated.

Until the inception of the project the country's power generation was primarily dependent on simple cycle generation technology. The success of the project paved the development of subsequent combined cycle power plants in the country. From an environmental perspective, the project significantly contributed towards reduction of air pollution by reducing the carbon dioxide emission from operation of a similar capacity power plant elsewhere in the country.

#### **Implementation Status of the Physical Components:**

The Project achieved its financial closing by the due date as in the Contract Agreements. The COD was declared before the scheduled date. During the construction phase, progress in installation and erection of the power plant and the offsite structures such as the gas pipe line and the transmission line was monitored by IDA supervision missions as well as by the Independent Engineer appointed by the private sector commercial lenders of the project.

Hyundai, as the EPC contractor for the project also completed the construction of the project ahead of the scheduled date. The implementation schedule of the project was all successfully achieved and the simple cycle COD of the project was declared almost six months ahead of its combined cycle COD.

#### **Environmental and Social Aspects of the Project**

Comprehensive Environmental Impact Assessment (EIA) study was carried out following the guidelines of the World Bank and the Department of Environment (DoE) of the GoB, for large power plants. The EIA report for the project was developed and was subsequently approved by both the World Bank and the DoE. The EIA report of the Project covers the environmental impacts of the project and the proposed/planned mitigation measures to be taken both during the construction phase as well as during the operation phase.

In the EIA report the environmental aspects those have been identified to have impacts on the environment from construction and operation of the power plant are:

1. Sitalakkhya River Dredging: The dredging activity, required to be undertaken to develop the site for construction of the power plant, was identified to cause disruption of aquatic habitats, disruption of fishery resource, siltation effect in the river etc. However the dredging was abandoned as the soil quality

of the river bed was not suitable for land filling. The required soil for filling up the plant site was transported through water ways from remote places.

2. Jetty Construction: Was identified to have adverse effect on river erosion on the other side of the river. The jetty design was carried out addressing the concern. The design was reviewed and approved by the relevant GoB agency.

3. Bridge on the Akkha Canal for Access road construction: An old memorial bridge was required to be relocated for development of the project site. The new site for the bridge was selected with direct and active participation of the local people on the same canal, around half kilometer upstream from the original location. The new bridge was constructed with higher capacity and longer service life.

### **Operation Impacts Identified:**

1. Air Quality: Base line data was collected on the ambient air of the vicinity of the power plant site. As the fuel gas to be used for operation of the plant was with zero sulphur content, there was no concern for emission of sulphur dioxide from operation of the plant. Level of Nox emission from the plant was also predicted to be very low compared to the DoE and the World Bank guidelines and for achieving that Low Nox Burners (LNB) was incorporated in the design of the gas turbine for the project.

2. Monitoring: During the operation of the plant for the last twelve years the ambient air on site has been routinely monitored for suspended particle and Nox level. For regulatory purpose, the tests had been carried out by the DOE and on top of that HPL had been carrying out the tests on the ambient air and stack emission routinely, which is six times a year, using its own in-house facilities and apparatus.

3. SPM measured comes up to be at the higher end of the limit and in occasions even exceeded the limit. This was primarily due to contribution from the industrial activities surrounding the power plant site.

4. Noise: Baseline study was carried out in the EIA study. Routine monitoring is carried out every month at four different places of the plant site both during the day time and night time. Reference is taken from the World Bank guidelines for mixed zone since the area surrounding the power plant site has developed in a bustling commercial and industrial character. Human habitat at one side of the plant is still there but noise at that point contributed from the operation of the power plant is low.

5. Waste Water Discharge: Waste water is generated from the power plant operation mainly from the water treatment system. A full capacity ETP is installed with a full facility in-house laboratory. The treated waste water discharge is monitored on-line for pH level to confirm compliance with the DoE guidelines. And on top of that as many as seventeen other chemical properties are routinely tested bi-monthly both at the in-house laboratory and the DoE laboratory. There were no instances, that any of the parameters of the treated waste water exceeded the relevant guideline limit.

6. Cooling Water Discharge: The plant uses once through cooling system for cooling the steam turbine condenser. The plant is designed to maintain the rise of the cooling water temperature to be within 5.5 degrees C at the discharge point of the condenser. More over the rise of temperature at a point 100 m from the point of discharge on the river is to be maintained below 1.0 degrees C. Online monitoring is there to monitor the rise of the cooling water temperature at the condenser discharge point.

The monitored data has always been well within the guideline limits.

As part of the EIA study a detail plume modeling was carried out on the Shitalakkhya River in the vicinity of the power plant area to develop baseline data. A follow up study was carried out in 2005, as was suggested in the EIA report, to evaluate the actual impact of the plumes on the temperature of the river water. The actual scenario was found within the ranges as predicted in the original study.

### **Social Impact and Compensation:**

The project has caused influx of as many as two hundred temporary workers during the annual maintenance periods of the plant. Out of that group usually half are from the local population while the rest are from remote areas from around the country. During those seven and fifteen days for the combustor inspection and the HGPI inspections respectively and which occurs in alternate years, and the 40 days of annual maintenance every six years skilled temporary workers are hired to support the scheduled maintenance works. Side-by-side the local economy gets boost from providing those workers food, accommodation and ancillary services as was predicted in the EIA report of the project.

Other than the scheduled outage program, the plant uses temporary hires solely from the local population who had by this time, developed sufficient skill to support day to day maintenance works on the power plant.

For rehabilitation of the livelihood of the project affected people the project had undertaken comprehensive programs. To provide the people with alternate occupation who lost their occupation such as cultivation and fishing and boatman, vocational training was provided to them or their selected nominee from the family to restore the economic impact on their livelihood from development of the project. A group of 350 of such people, identified as directly impacted from the project, was rehabilitated following the relevant guidelines of the World Bank.

An old bridge was displaced to accommodate the construction of the approach road to the plant site. The project company constructed a new permanent concrete bridge over the canal at a new location, upstream the canal. The bridge today is providing more utility for the local people, for being on the new location, than before. The cost of the project was nearly about USD 40,000.

A local high school was renovated with addition of new floor on the existing structure by significantly increasing its capacity to provide quality education facility to the local people around the plant site. The cost of the project was nearly about USD 150,000.

As part of the annual Social responsibility program the project allocated nearly USD 25,000 in its fiscal budget. From that fund various infrastructure development activities are carried out to improve the quality and standard of life of the local people.

Some of the mentionable activities are development of storm drainage system, development of library and computer labs in the local schools, distribution of uniform and bags to students of local schools, arrangement of vocational training for the local youths at reputed vocational training center, arranging health check camps separately for elderly people and for mother & child, holding programs to improve health and other woman rights awareness among the local people and also to send their children to school. The project also distributes around two thousand saplings every year among the local inhabitants as part of its environment conservation program.

### **Project Sustainability**

The project was initiated on a robust financial model. Fuel gas availability was confirmed under a sovereign guarantee from the Government of Bangladesh. With inclusion of the most efficient gas

turbine and reliable steam turbine the plant was configured to generate electricity at a high efficiency on the scale of international standard.

With a very reliable maintenance program in place for the gas turbine and conducted under the direct supervision of MHI the original manufacturer of the gas turbine the plant's dependable capacity has been maintained at the design level after twelve years of operation.

Concerns:

1. Payment from BPDB against monthly invoices has so far been regular without default other than few exceptions. Project company did not face any debt repayment problem arose from non-payment by the BPDB.
2. The gas supply situation had been a real concern for the last five years. The gas supply situation has been worsening in steady trend and presently the situation is forcing the plant to be operated at reduced capacity. At situations like that the plant was even required to be shut down due to failure of Titas to supply the required gas to the plant.
3. The project agreements had been safeguarded by both the parties. There had been no instances where any covenant from any agreements was violated by any party to any of the project agreements. Being the project, first of its kind in the country, concern was there regarding the compliance of the covenants by the parties to the project agreements. The Guarantee and the Counter Guarantee Agreements created for the project acted as safeguards for the main project agreements such as the Implementation Agreement, the Power Purchase Agreement, the Gas Supply Agreement and the Land Lease Agreement and based on the dependability of those guarantee instruments the project finance, partly from commercial lenders, were made possible.

## **Performance Assessment**

### **Bank performance**

The co-ordination between the WB's representatives and Project Company had been result oriented all along. On environmental issues, the project company received comprehensive support in designing its monitoring program as well as in the implementation. The Bank has been instrumental in resolving disputes related to environmental issues with the relevant Government agency. All out support from the Bank was received to develop and maintain an effective environmental conservation program related to operation of the plant.

During the initial years of the project's operational life, the Bank's monitoring and supervision was close and supporting. However, the Bank's engagement could be better in the years from 2008 to 2011 when there was no supervision mission that came to talk to us. Since 2011, the project received enhanced supervision support from the Bank in resolving some commercial as well as technical issues with relevant government agencies.

The most recent and ongoing challenge in the plant operation is insufficient of fuel gas from for operation of the plant. Titas has been consistently unable to cater to the fuel requirement of the plant for its full capacity operation. From time to time, there had been solution provided through Bank's intervention but all in ad hoc basis. The project company direly needs the intervention and support from the Bank in resolving such issue in long term. The project's viability and successful operation will be challenged should the fuel gas crisis situation persists.

## **Borrower performance**

Since implementation of the project, it has been generating power with 57% combined cycle efficiency. The reliability of the plant is around 99% while the availability is around 92% and capacity factor varied between 80% and 85% depending on grid requirements. The plant has all along been operated maintaining very high degree of safeguard. All the environmental parameter limits has been maintained and the environmental monitoring program has been strongly followed.

The plant has been operated with high safety standards. There has not been any fatal accident since the COD. Only two Lost Time Accidents (LTAs) recorded and both were related to minor physical injury. Presently the plant is running with 3300 days without any LTA.

The project company also, in any instance, didn't fail to comply with the repayment obligations to its lenders. In all respect, with the support mechanism of the contractual arrangements, the performance as operator has been satisfactory.

## **Key Lessons Learned**

The project is now in the mid-way of the tenure of its contracts with GOB. The WB presence in some instances had been instrumental in resolving some issues. Should the Bank ceases its supervisory role, concern is there that compliance level of the contract covenants by the parties may deteriorate.

Bank's involvement in resolving issues with the GOB could be more visible and direct. Bank's support and intervention in resolving the current gas supply issue is most vital for sustainable operation of the project.

## **Conclusion:**

The IDA PRG was crucial in mobilizing private sector financing from the international debt market for Haripur. This was the first time that such long term international financing was made available for Bangladesh. The successful financial closure of Haripur through the deployment of the IDA Guarantee will serve as an important milestone in establishing a track record for facilitating financial capital flows to the country.

As a whole, the Project Company is grateful for the Bank's support provided for the implementation and operation of the Project. The Project Company would sincerely encourage the Bank's participation in development of similar projects in the developing countries where potential and intending private sector investors require guarantee for their investments. The overall success of the Project can be largely attributed to the participation of the bank in the venture.



## **Annex 8: List of Supporting Documents**

1. BPDB, Annual Reports, 2004-05, 2005-06, 2006-07, 2007-08, 2008-09, 2009-10, 2010-11, 2011-12, 2012-13
2. BPDB, Auditor's Report and Accounts, 2012-13
3. Haripur Power Limited, Annual Reports, FY 2003, 2004, 2006, 2008, 2009, 2010, 2011, 2012, 2013
4. Haripur Power Limited, Technical Advisor Report, Dated 28 June 2011, 03 May 2012 and 12 September 2013
5. Indemnity Agreement between People's Republic of Bangladesh and International Development Association
6. Project Appraisal Document, 3 May 2000
7. Aide Memoire, Implementation Review Missions, December 2004, April 2006, November 2008, January 2012, June 2013
8. Aide Memoire, Appraisal Missions, February-March 1999, November 1999
9. Implementation Status and Results Report, Dated 19 July 2006, 23 April 2007, 13 December 2008, 23 December 2011, 15 June 2012, 27 August 2013
10. Guarantee Agreement between International Development Association and IDA Facility Agent (Australia and New Zealand Banking Group Limited)
11. Petrobangla, Website, [http://www.petrobangla.org.bd/data\\_marketing\\_category.php](http://www.petrobangla.org.bd/data_marketing_category.php)
12. Petrobangla, Annual Report, 2012
13. Bangladesh Bank, Website, <http://www.bangladesh-bank.org/econdata/index.php>

## Annex 9: Contractual Framework for Guarantee Transaction

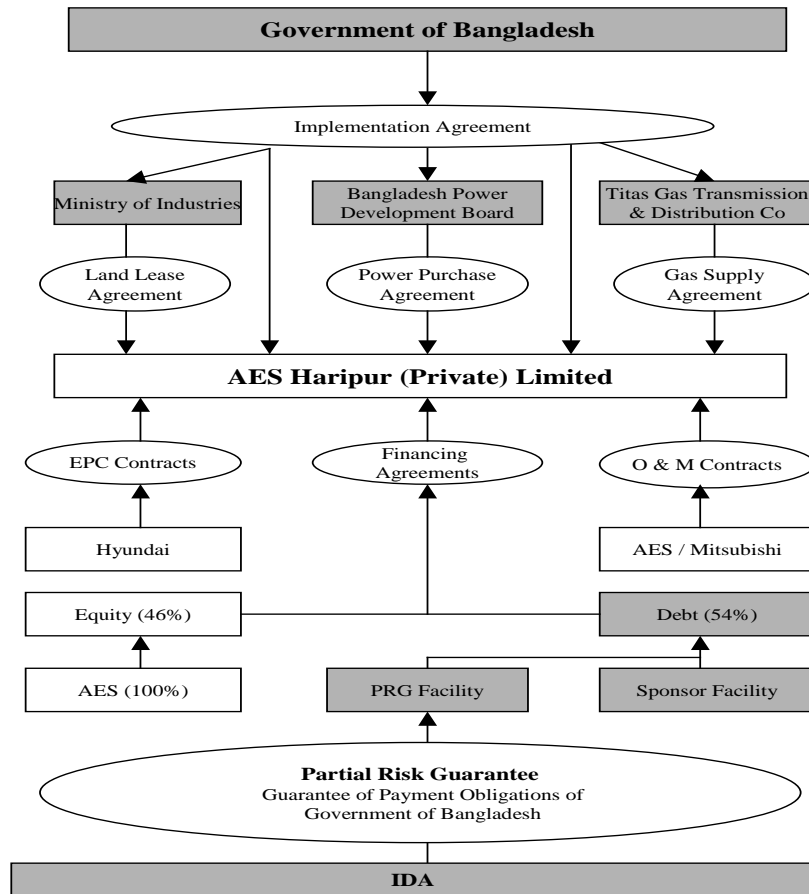


Figure: Contractual Structure for the Haripur Project

The figure above gives a pictorial representation of contractual structure for the Haripur Project. The major contracts that formed part of the project structure are described below:

- The Implementation Agreement (IA) was signed between Haripur and GoB in September 1998, and defines the rights and obligations of the parties. It was for a period of 22 years from commercial operations of the Project.
- The Power Purchase Agreement (PPA) signed between Haripur and BPDB, provides for the sale of electricity to BPDB for the term of the Implementation Agreement.
- A Gas Supply Agreement signed between Haripur and Titas on the same date and for the same term as the IA and the PPA provided for the supply of gas by Titas to the plant at a price to be determined from time to time by the Ministry of Energy and Mineral Resources.
- The Land Lease Agreement (LLA) signed between the project company and the Ministry of Industries, granted a lease to the company for a term that is equal to (i) the 25<sup>th</sup> anniversary of the commercial operations date; or (ii) the third anniversary of the expiration or termination of the PPA, whichever is longer.

- e) The Engineering, Procurement, and Construction (EPC) Contract dated April 1999, between AESH and Hyundai Engineering and Construction (HHI) and Hyundai Heavy Industries (HEC) was a fixed price turnkey contract under which the EPC contractor procured all works and services necessary in connection with the design, engineering, procurement, site clearance, construction, start-up and testing of the plant.
- f) An Operations and Maintenance Service Contract (O&M) dated April 1999 was entered between Haripur and AES Bangladesh Operations (AESBO), an offshore wholly-owned subsidiary of AES Corporation.
- g) Loan Documentation consisted of the Common Terms and Inter-creditor Agreement, the Share Retention and Project Funds Agreement, the Accounts and Security Trust Agreement and the respective loan Agreements.

# Annex 10: Project Map

