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BANGLADESH

PROJECT PERFORMANCE ASSESSMENT REPORT

**SECOND GAS DEVELOPMENT PROJECT
(CREDIT 1586-BD)**

**GAS INFRASTRUCTURE DEVELOPMENT PROJECT
(CREDIT 2720-BD)**

July 1, 2004

*Sector and Thematic Evaluation Group
Operations Evaluation Department*

Currency Equivalents (annual averages)

Currency Unit = Taka Tk)

1984	US\$1.00	Tk 26.0	1993	US\$1.00	Tk 39.6
1985	US\$1.00	Tk 26.0	1995	US\$1.00	Tk 40.3
1987	US\$1.00	Tk 30.8	2000	US\$1.00	Tk 52.1
1992	US\$1.00	Tk 39.0	2003	US\$1.00	Tk 58.5

Abbreviations and Acronyms

A-B	Ashuganj-Bakhrabad gas pipeline	IOC	International Oil Company
BAPEX	exploration company	IPPs	Independent Power Producers
BCF	billion cubic feet	LPG	Liquified Petroleum Gas
BCM	billion cubic meters	MEMR	Ministry of Energy and Mineral Resources
CNG	Compressed Natural Gas	MMCFP	Million Cubic Feet Per Day
CIDA	Canadian International Development Agency	MTR	Mid-term review
DfID	Department for International Development, UK	PIU	project implementation unit
EIRR	Economic Internal Rate of Return	PPAR	Project Performance Assessment Report
ESAC	Energy Sector Adjustment Credit	PSC	Production Sharing Contract
GIDP	Gas Infrastructure Development Project	PSI	pounds per square inch
GOB	Government of Bangladesh	RPGCL	an exploration company
GTCL	Gas Transmission Company Limited	SAR	Staff Appraisal Report
HCU	Hydrocarbon Unit	SCADA	Supervisory Control and Data Acquisition
HQ	Bank Headquarters in Washington, DC	SGDP	Second Gas Development Project
ICR	Implementation Completion Report	SGFL	Sylhet Gas Fields Limited
IDA	International Development Association	T&D	Transmission & Distribution
		TA	Technical Assistance
		TCF	Trillion Cubic Feet
		TM	Task Manager
		UNDP	United Nations Development Programme

Fiscal Year

Government: July 1–June 30

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OED Mission: Enhancing development effectiveness through excellence and independence in evaluation.

About this Report

The Operations Evaluation Department assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the Bank's self-evaluation process and to verify that the Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, OED annually assesses about 25 percent of the Bank's lending operations. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or Bank management have requested assessments; and those that are likely to generate important lessons. The projects, topics, and analytical approaches selected for assessment support larger evaluation studies.

A Project Performance Assessment Report (PPAR) is based on a review of the Implementation Completion Report (a self-evaluation by the responsible Bank department) and fieldwork conducted by OED. To prepare PPARs, OED staff examine project files and other documents, interview operational staff, and in most cases visit the borrowing country for onsite discussions with project staff and beneficiaries. The PPAR thereby seeks to validate and augment the information provided in the ICR, as well as examine issues of special interest to broader OED studies.

Each PPAR is subject to a peer review process and OED management approval. Once cleared internally, the PPAR is reviewed by the responsible Bank department and amended as necessary. The completed PPAR is then sent to the borrower for review; the borrowers' comments are attached to the document that is sent to the Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

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The time-tested evaluation methods used by OED are suited to the broad range of the World Bank's work. The methods offer both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. OED evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (more information is available on the OED website: <http://worldbank.org/oed/eta-mainpage.html>).

Relevance of Objectives: The extent to which the project's objectives are consistent with the country's current development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). *Possible ratings:* High, Substantial, Modest, Negligible.

Efficacy: The extent to which the project's objectives were achieved, or expected to be achieved, taking into account their relative importance. *Possible ratings:* High, Substantial, Modest, Negligible.

Efficiency: The extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. *Possible ratings:* High, Substantial, Modest, Negligible. This rating is not generally applied to adjustment operations.

Sustainability: The resilience to risk of net benefits flows over time. *Possible ratings:* Highly Likely, Likely, Unlikely, Highly Unlikely, Not Evaluable.

Institutional Development Impact: The extent to which a project improves the ability of a country or region to make more efficient, equitable and sustainable use of its human, financial, and natural resources through: (a) better definition, stability, transparency, enforceability, and predictability of institutional arrangements and/or (b) better alignment of the mission and capacity of an organization with its mandate, which derives from these institutional arrangements. Institutional Development Impact includes both intended and unintended effects of a project. *Possible ratings:* High, Substantial, Modest, Negligible.

Outcome: The extent to which the project's major relevant objectives were achieved, or are expected to be achieved, efficiently. *Possible ratings:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry and supported implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of the project). *Possible ratings:* Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower assumed ownership and responsibility to ensure quality of preparation and implementation, and complied with covenants and agreements, towards the achievement of development objectives and sustainability. *Possible ratings:* Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

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Principal Ratings

Second Gas Development Project (Cr. 1586-BD)

	<i>ICR*</i>	<i>ICR Review*</i>	<i>PPAR</i>
Outcome	Satisfactory	Satisfactory	Satisfactory
Sustainability	Likely	Likely	Highly Likely
Institutional Development Impact	Negligible	Negligible	Negligible
Bank Performance	Unsatisfactory	Unsatisfactory	Unsatisfactory
Borrower Performance	Satisfactory	Highly Unsatisfactory	Unsatisfactory

Gas Infrastructure Development Project (Cr. 2720-BD)

	<i>ICR*</i>	<i>ICR Review*</i>	<i>PPAR</i>
Outcome	Unsatisfactory	Unsatisfactory	Moderately Unsatisfactory
Sustainability	Unlikely	Unlikely	Likely
Institutional Development Impact	Negligible	Negligible	Modest
Bank Performance	Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
Borrower Performance	Unsatisfactory	Unsatisfactory	Highly Unsatisfactory

* The Implementation Completion Report (ICR) is a self-evaluation by the responsible operational division of the Bank. The ICR Review is an intermediate OED product that seeks to independently verify the findings of the ICR.

Key Staff Responsible

Second Gas Development Project (Cr. 1586-BD)

<i>Project</i>	<i>Task Manager/Leader</i>	<i>Division Chief/ Sector Director</i>	<i>Country Director</i>
Appraisal	U. Kirmani	E. McCarthy	Y. Rovani
Mid-term	H. Morsli	F. Temple	A. Hamilton
Completion	H. Morsli	M. Garcia-Zamor	P. Isenman

Gas Infrastructure Development Project (Cr. 2720-BD)

<i>Project</i>	<i>Task Manager/Leader</i>	<i>Division Chief/ Sector Director</i>	<i>Country Director</i>
Appraisal	N. Zhao	M. Garcia-Zamor	P. Isenman
Mid-term	S. Mukherji	A. McKechnie	P. Landell-Mills
Completion	A. Huq	A. McKechnie	F. Temple

Preface

This is a Project Performance Assessment Report (PPAR) on the Bangladesh Second Gas Development project (Cr. 1586-BD) and Gas Infrastructure Development project (Cr. 2720-BD). The Second Gas Development project was funded by an IDA Credit of SDR 112.9 million, approved in April 1985. Cofinancing of US\$88.2 million was provided by CIDA (US\$26.2 million), DFID (US\$38.3 million), DGIS, Netherlands, (US\$15.2 million), and UNDP (US\$8.5 million). It was closed in December 1993, three and a half years after the original closing date, when an undisbursed balance of SDR 28.7 million was canceled. Subsequently, a credit of SDR 83.4 million was approved in May 1995 to support the Gas Infrastructure Development Project, which closed on schedule in June 2000, when SDR 34.5 million was canceled. Cofinancing of US\$26.9 million was provided by DFID (UK).

This report is based on the Implementation Completion Reports prepared by the South Asia Region, (Report no. 16257 of January 1997 and report no. 21529 of January 2001), the appraisal documents (Report no. 5353, April, 1985, and Report no. 13014, April, 1995) loan documents, project files and discussions with Bank staff. An Operations Evaluation Department (OED) mission visited Bangladesh in December 2003 to discuss the effectiveness of the Bank's assistance with the government, the project implementing agencies, and cofinanciers. The collaboration and assistance of all these officials are gratefully acknowledged.

The Bank has been involved in the development of Bangladesh's gas resources for over 25 years and provided substantial financial support and policy advice to the government for the gas sector during the 1980s and 1990s. This report reviews the last two IDA-funded gas projects in Bangladesh at a time when a re-engagement in the gas sector is under consideration after a hiatus of several years.

The mission also carried out a performance reassessment of the Energy Sector Adjustment Credit (1989), which will be issued concurrently as a separate report. It contains complementary information on institutional reforms and pricing in the gas sector during the 1990s.

Following standard OED procedures, the draft of the PPAR was sent to the Borrower and cofinanciers for comments before finalization. The Borrower's response is attached as Annex B.

Summary

The Second Gas Development Project and the subsequent Gas Infrastructure Development Project were the Bank's last two gas projects so far in the Bangladesh, covering a 15-year period from 1985 to 2000. The projects shared two common objectives: alleviation of the worsening gas supply shortages and strengthening of the institutional capabilities of Petrobangla, the parastatal managing Bangladesh's gas sector. The first project also sought to evaluate gas reserves to provide a basis for long-term gas field development, while the second project focused on further reforms to improve the enabling environment for private sector participation in the sector.

The overall outcome of Second Gas Development Project was satisfactory. Highly relevant objectives were substantially achieved and project resources were effectively utilized. The reservoir engineering study was extremely valuable and led to the tripling of the estimate of Bangladesh's proven gas reserves. Although complex project design and repeated problems of procurement and contract management led to major delays, the project ultimately exceeded its production objectives and yielded high economic returns. Sustainability is rated as highly likely, given that the installations funded by the project have been operating satisfactorily for over a decade. However, the project did not improve Petrobangla's operational and management capability and thus institutional development is rated negligible. Bank and borrower performance are both assessed as unsatisfactory.

The outcome of the Gas Infrastructure Development Project is moderately unsatisfactory, despite its highly relevant objectives. Physical components were built at substantially lower cost than appraised, are operated satisfactorily but only partially increased gas supplies. Sustainability is rated as likely. Modest improvements occurred in Petrobangla's ability to deal with environmental and safety matters and the fledgling gas transmission company was strengthened. Institutional development is rated as modest. At appraisal there was inadequate attention to sector policy and organizational reform - components, actions or loan conditionality to further the private sector development objective were missing. Government's reluctance to raise gas prices and to complete asset transfers to the new gas transmission company forestalled project restructuring that would have enabled the use of major cost savings. As a result, over 40 percent of the Credit that could have been used for investments in system expansion with high economic returns, was canceled. As for its predecessor project, the financial and institutional weakness of Petrobangla is a significant downside risk to overall long-term sustainability.

Bank and Borrower performance is rated highly unsatisfactory. Specifically, the project was unsatisfactory at entry and supervision was deficient. Government ownership was low and it was unwilling to find a solution to the stalled transfer of pipelines to the transmission company. Financial covenants were ignored and there was no corrective action on gas prices, despite repeated reminders from the Bank and other lenders.

The following lessons are drawn from the experience of these two projects:

- In designing institutional development components of projects, the incentives for those directly concerned by proposed changes should be well aligned with the project objectives. In particular, the staffing and remuneration implications of major institutional reorganizations (such as the creation of GTCL), need to be well understood and explicitly addressed if reorganizations are to be successfully implemented;
- Building a strong gas industry of international standard requires a major ID effort: better management, greatly increased training, better remuneration and more autonomy;
- The Bank should take a less dogmatic approach to sector reforms and practice greater sensitivity to local socio-political constraints, if it is to achieve collaborative dialog and succeed in obtaining Borrower 'buy-in' to its proposals.
- When the Bank finds it difficult to justify its support for a particular sector due to policy differences, it should strategically weigh the benefits of maintaining a flexible form of engagement against the consequences of full withdrawal. Repeated sharp changes in the Bank's involvement could be damaging to its credibility and could constrain its ability to seek policy reforms.

Gregory K. Ingram
Director-General
Operations Evaluation

Background

1. Natural gas is the principal source of commercial energy in Bangladesh, accounting for about 40 percent of the total energy supply and well over 60 percent of commercial energy consumption. The country's remaining proven and probable gas reserves are already large but could be substantially increased by field delineation and infill drilling in existing geological structures. The ratio of reserves to annual production is about 38 years, considerably higher than for most gas-producing countries.
2. When the Second Gas Development Project (SGDP) was approved in the mid-1980s, the gas industry in Bangladesh was still at an early stage of development. Six gas fields were in production, and of the country's total gas-in-place only a third was considered proven due to the modest amount of delineation drilling.
3. By 1985, the development of the gas sector had led to rapid growth in commercial energy use and a progressive decline in the share of commercial energy derived from (imported) liquid hydrocarbons. At that time, a main thrust of the energy policy was to reduce the dependence on oil imports by accelerating the development of the domestic gas resources (for power and for fertilizer) and increasing the economy's absorptive capacity for gas.¹
4. Subsequent developments have shown that the faith in the country's gas prospects was justified. Gas production has increased tenfold in the past 20 years, doubling over the past decade. Almost half of all gas produced in Bangladesh is consumed for power generation, which is now overwhelmingly gas-based (almost 90 percent). The fertilizer sector consumes over a fifth of gas production, while the remaining third is consumed by the industrial and residential users.² The demand for gas to 2010 is expected to continue growing at 6 to 8 percent annually,³ driven by the robust growth in power demand and the low level of access to electricity in rural areas.
5. Since 1994, growth in the Bangladesh gas sector has been helped by foreign private companies operating under production sharing contracts (PSCs).⁴ Even so, there has been little systemic reform over the past 20 years. The sector is still largely dominated by the government, acting since the mid-1970s through Petrobangla, a state holding company with multiple subsidiaries.
6. Petrobangla (PB) is responsible for the exploration and development of Bangladesh's oil, gas and mineral resources. It has been a statutory body of the government since 1985, operating under the purview of the Ministry of Energy and Mineral Resources. It holds the shares of all the state-owned companies dealing in oil, gas and mineral exploration and development (now nine in number for gas, plus two for solid minerals) on the Government's behalf. In the mid-1980s the PB Group consisted of

1. At the time, the cost of oil imports was equivalent to about 60 percent of the country's export earnings.

2. About 1.2 million households (only about 5 percent of the total) have access to piped gas supply.

3. Source: Bangladesh Optimal Gas Utilization Study, by HCU/ECON, September 2002.

4. Foreign companies accounted for about 20 percent of total gas production in FY 2001-02.

three production companies⁵, and two transmission and distribution companies.⁶ An exploration company (BAPEX) and natural gas liquids company (RPGCL) were set up in the late 1980s and the gas transmission company (GTCL) was created in the early 1990s. A distribution company to supply gas to consumers west of the Jamuna River was set up in 1999.

Project Objectives, Components and Design

7. The Second Gas Development project and Gas Infrastructure Development project had several common objectives and are treated in this report as a series. The later project has been given greater emphasis than the first in the analysis because the SGDP was completed over a decade ago and the evidentiary trail on it has been somewhat overwritten by the outcomes of the GIDP. Furthermore, the legacy of actions taken by the Bank in the last year of the GIDP continues to be relevant for any new World Bank assistance in the gas sector.

8. The objectives of the **Second Gas Development** project were to (a) increase gas supply to reduce shortages; (b) to evaluate the gas reserves to provide a basis for long-term gas field development; and (c) to strengthen the operational and management capability of the Petrobangla Group companies.

9. The main project components were:

- **Gas Field Development:** The initial development of northeastern gas fields (Kailashtila and Beani Bazar), primarily supplying the Dhaka area, through the drilling of appraisal wells, together with the workovers of two existing wells at Rashidpur (US\$23 million).
- **Gas Field Appraisals:** Initial appraisal wells at four main gas fields (Bakhrabad, Titas, Habiganj, and Rashidpur) (US\$33 million).
- **Gas Infrastructure Development:** Gas and condensate treatment facilities at Kailashtila, Beani Bazar, and Rashidpur, a gas pipeline north-south from Kailashtila via Beani Bazar and Rashidpur to Ashuganj, and a condensate pipeline from Beani Bazar to Kailashtila. (US\$174 million)
- **Reservoir engineering studies of eight gas fields.**

SGDP Design

10. The effort to expedite the development of gas resources in Bangladesh and to bring the gas to the market in the shortest possible time, made project design unduly complex. It was complex and difficult to administer and vulnerable to cascading delays in implementation – a risk that was not fully appreciated at the time of appraisal:

5. Bangladesh Gas Fields Co., Bakhrabad Gas Systems Ltd., Sylhet Gas Fields Ltd.

6. Titas Gas Transmission & Distribution Co., Jalalabad gas Transmission & Distribution Co.

- First, the project was undertaken without firm knowledge of the potential of the relevant gas fields, information that would be provided by the appraisal wells. Given the evident potential of the Bangladeshi gas fields, it was appropriate for the project to incur the risk that this drilling inevitably implied, and the results were on the whole very positive.
- Second, major components of the project were dependent on a sequence of events with the risk of cascading delays: (i) the drilling of the appraisal wells, to be undertaken under a contract financed by CIDA (Canada); (ii) the evaluation of these results to determine gas reserves (iii) the design of the gas pipelines and gas treatment plans; and (iv) the construction of these gas treatment and distribution facilities.
- Third, the resulting size of the project required substantial cofinancing. The total project cost was estimated at appraisal at US\$221 million equivalent, of which IDA was to contribute US\$110 million and bilateral co-financiers (Canada, UK, Netherlands and UNDP) a combined total of US\$83 million. GOB's contribution was to be US\$28 million. While the cofinanciers cooperated well throughout the period of the project, the numerous agreements that were required between the individual cofinanciers and the Government, and between the cofinanciers themselves, inevitably added to the complexity of the project.

11. Even in the absence of the procurement problems that dogged this project, a simpler, multi-project structure would have been preferable. The appraisal drilling, analysis of results and design of the subsequent investments could have comprised an initial operation, with a second, a follow-on project that could have supported the priority investments in field facilities, pipeline and gas fractionation based on fully prepared and mutually agreed investment plans. This would have permitted each project to be prepared in more final form prior to approval, and reduced the administrative burden on the project entities in Bangladesh.

12. The objectives of the **Gas Infrastructure Development project** were to: (a) alleviate the worsening gas supply shortages through partially financing the sector's priority investments; (b) assist in implementing further reforms to improve the enabling environment for private sector participation in the sector; and (c) develop the gas sector entities' institutional capabilities, particularly in the areas of operations and maintenance, safety, environmental protection, accounting, and financial management.

13. The main project components were:

- A gas pipeline from Ashuganj to Bakhrabad (US\$55 million).
- A Supervisory Control and Data Acquisition (SCADA) and pipeline telecommunication system for the entire Petrobangla Group gas transmission trunkline from Kailashtilla to Chittagong (US\$30 million).
- Three production wells at Rashidpur gas field (US\$17 million).

- A gas processing plant to purify gas from the new wells (US\$15 million).
- Technical assistance for: (i) project implementation, (ii) building institutions to develop managerial and technical capabilities of the newly created Gas Transmission Company Limited (GTCL), establish a group-wide environmental and safety management system, strengthen Petrobangla's reservoir management capability, and improve the management systems of the Petrobangla Group; and (iii) training of Petrobangla staff in key aspects of gas sector operations (US\$19 million).

GIDP Design

14. The project did not include any component, actions or loan conditionality to further the private sector development objective (para. 12 (b) above), although the Bank had had an ongoing dialog with GOB since the Energy Sector Adjustment Credit (ESAC, 1989-91) on the measures to improve the enabling environment for private investment in the gas sector. An accompanying PHRD Trust Fund permitted a wide range of gas sector analysis to be carried out and assisted with GOB's promotional activities directed at international oil companies (IOCs). Advice from the Bank also contributed to the publication in mid-1993 of a new petroleum policy by GOB, with liberalized contractual terms for production sharing contracts (PSCs) with international oil companies. The latter had already begun to invest in exploration before Board approval of GIDP. It could therefore be argued that the appraisal process for GIDP had already accomplished a significant breakthrough in improving the environment for PSD. Nevertheless, there remained other sectoral issues which remained unaddressed, but again, these were being tackled outside the framework of GIDP.

15. For example, preparatory work for a suitable regulatory framework (i.e., to divest part of the GOB shareholdings in the Petrobangla operating companies and the replacement of civil servants on operating company Boards by directors from the private sector) was expected to be undertaken as part of an ADB project that was already being implemented. These factors may help to explain the omission of any specific PSD component from the design of GIDP, but it was evidently inappropriate to include an explicit PSD objective without any accompanying project elements. Objective (b) on further reforms and private participation should have been dropped at the time of the mid-term review, or alternatively, the project could have been restructured to explicitly incorporate a component designed to further it, particularly as the actions expected under the ADB project did not materialize.

16. Another significant omission from the GIDP conditionality was a dated timetable for the transfer to GTCL of high-pressure pipelines from the other operating companies. This was a contentious issue which was a frequent irritant in the Bank's relationship with GOB/Petrobangla throughout the 1990s, and which was a contributory factor in the decision not to extend the closing date of GIDP (para. 57). The IDA-funded North-South and Ashuganj-Bakhrabad pipelines could not be operated by GTCL in isolation from the rest of the high-pressure transmission system, over which GTCL lacked control. In addition, full operational responsibility in the hands of GTCL was a *sine qua non* for the SCADA component of GIDP. Despite this, the project design did not include the

preparatory steps for pipeline transfers such as asset valuation, and a study of the staffing and remuneration implications for both the new company as well as the existing operating companies, which were to 'lose' part of their facilities to GTCL.

17. More consultation and a broader debate on the issue of pipeline transfers to GTCL with the staff and management of the affected operating companies during the appraisal process may have helped to smooth the way for these to occur. At the very least, the Bank would have gained a better understanding of the reasons for the resistance from the operating companies and more effort could have gone to finding a solution acceptable to all parties.

18. In light of the above points, this PPAR shares the ICR's assessment of the project's quality at entry as unsatisfactory.

Relevance of Objectives

SGDP

19. IDA's policy views in the mid-1980s were embedded in the formulation of its strategy for the oil and gas sector, which was described as follows in the SAR for SGDP:

- (a) to build up the capability of GOB in the formulation of adequate policies;
- (b) to promote a more efficient operation of the public sector enterprises in the sector;
- (c) to encourage the development of the gas sector by introducing modern technology and field management practices, through the acquisition of seismic data, appraisal drilling and reservoir studies;
- (d) to maximize the absorptive capacity of the economy for natural gas; and to support exploration promotion to the international oil industry.

20. This was a normal IBRD/IDA approach for a developing country's petroleum sector in the mid to late 1980s, – seeking to enhance the quality and competence of the domestic institutions (government and state corporations), supporting key productive investments by these entities, improving policies (particularly pricing), and encouraging foreign investment in the risky exploration for new reserves, but not seeking fundamental changes in the industrial structure, organizational framework and ownership of the hydrocarbons sector.

21. Within this context, SGDP mainly addressed the upstream development of the gas sector ((c) above) through specific high priority investments and corporate strengthening (through training and technical assistance). The Energy Sector Adjustment Credit, which was implemented during 1987-90 (thus overlapping with SGDP), sought the strengthening of the Petrobangla Group by means of an institutional reorganization, based on studies carried out as part of SGDP. Both of these lending operations had covenants concerning gas prices. Gas pricing and sector finances are discussed in more detail in the Reassessment Report for ESAC, which was prepared concurrently with this PPAR.

22. The objectives of SGDP were highly relevant throughout the project's life and beyond. They remain so today, twenty years after the project was appraised in mid-1984. Expansion of gas supplies, appraisal of existing Petrobangla gas fields and strengthening of the Petrobangla Group of companies are still high sectoral priorities.

GIDP

23. GIDP's roots go back to 1990, when the project was first identified. It retained its '1980s flavor' despite the 5-year period to Board approval in 1995. As such, it contained little in the way of sectoral transformation, such as divestiture of assets, or private financing of gas pipelines. The Bank team that took over responsibility for the energy portfolio midway through implementation (in 1998) was uncomfortable with GIDP as initially designed.

24. The objectives of GIDP as spelt out in the SAR were highly relevant to the issues in the gas sector and remain so today. Reforms to improve the environment for private investment in the sector and institutional capacity building within the Petrobangla Group still deserve priority. However, GIDP should probably have had a stronger sector policy and organizational reform focus right from the start. These lacunae became problematic mid-way through implementation. During supervision, the Bank team attempted to tackle big sectoral policy issues without a suitable lending instrument or conditionality with which to engage GOB.

Efficacy

SGDP

25. Despite major delays due to the complex project design and repeated problems of procurement and contract management (para. 42), the project ultimately exceeded its objective of increasing gas supply. The ICR states that at the end of 1995, there were eight operating wells producing at a rate of 90 BCF of natural gas and 0.4 million barrels of condensate per annum, and estimates at that time assumed a cumulative gas production from the project through 2007/08 of 1.8 TCF, double the estimate at appraisal, and also an increase in condensate production. The North-South gas pipeline that was built under SGDP is an integral segment of the main GTCL high-pressure gas transmission system, linking the Dhaka area to gas fields in the north east.

26. The reservoir engineering study carried out under SGDP was extremely valuable and led to the tripling of the estimate of Bangladesh's proven gas reserves from 4 to 12TCF. Although in great need of updating, it remains the sole basis for Petrobangla's analysis and planning of field development programs.

27. However, SGDP only had a minor impact on operational performance of the implementing agencies. Covenants to the Credit for SGDP obliged GoB to introduce gas price increases in 1985 and 1986, with annual adjustments as necessary beginning in 1988. Partial compliance was achieved in FY88, FY89 and FY90, and the covenant was

deemed complied with in FY92, at which time natural gas prices for all consumer groups had been brought up to or above the then estimates of the economic cost of gas supply. Thereafter GOB was increasingly reluctant to take action to maintain gas prices at least constant in real terms and price adjustments were infrequent and insufficient to compensate for inflation. Finances of the Petrobangla Group suffered as a result.

28. Since SGDP satisfactorily met two of the three stated project objectives – increased gas supply and evaluation of gas reserves, the efficacy of the project is evaluated as substantial.

GIDP

29. The physical components of GIDP were designed to increase gas supply. They have partially succeeded in doing so. The Ashuganj to Bakhrabad pipeline was successfully completed at a cost considerably less than appraised. At the time the ICR was written in 2000, gas flows through the Ashuganj-Bakhrabad pipeline averaged under 100 MMCFD, much less than expected at appraisal, due to the unforeseen supply from the Sangu offshore gas field to Chittagong. However, since then there has been a sharp increase in the utilization of the pipeline to supply Dhaka as well as the large new Independent Power Producers (IPPs) at Haripur and Meghnaghat. Without this line, Petrobangla would also be unable to meet the demand of the KAFCO fertilizer plant. The current flow rate is about 220 MMCFD, or about 50 percent of the installed capacity. The commissioning of the Maulavi Bazar field and supply from an additional six wells being drilled in existing fields will lead to a further rise in the flow rate of about 75-100 MMCFD from 2005. Concerns about the oversizing of the pipeline therefore seem to be misplaced since such investments are necessarily ‘lumpy’ and therefore are underutilized in the initial years of operation. OED does not concur with the ICR rating that the outcome of this Ahuganj-Bakhrabad pipeline component is unsatisfactory.

30. Based on the geological and geophysical work undertaken by the reservoir study by the firm IKM⁷, the three wells drilled in the Rashidpur field were expected to produce 90 MMCFD of gas. The maximum combined flow rate from the wells during testing was 71 MMCFD. But once production started, flow rates fell sharply and today they produce only about 30 MMCFD. Since only four wells had been drilled in the field prior to GIDP, the field’s geology was poorly understood. Hence, given the technical knowledge available at the time of appraisal, it is difficult to see how this outcome could have been avoided. After completing these three wells, it was found that the geophysical/geological interpretations in the IKM study regarding the reservoir sands did not match the actual strata discovered by drilling. This is unsurprising. In reality, the three wells drilled under GIDP were more in the nature of field appraisal wells, rather than purely for production. 3-Dimensional seismic work to better understand the geological structure has still to be carried out on this field⁸.

7. Carried out as part of SGDP.

8. The technical understanding of the structure of all of PB’s gas fields would be greatly enhanced by a 3-D seismic program, which should be undertaken before further drilling is carried out.

31. While the outcome is disappointing, it is part of the normal risks inherent in the hydrocarbons business and the Petrobangla Group has had a low failure rate so far by international standards. With hindsight, it appears that it would have been better to award the contracts for the surface processing facilities only after well performance had been verified. But given the delays to this component, the few instances of poor performing producer wells in the past and the pressing need for gas, it is easy to see why this was not done. In any event, the surface facilities can be relocated and used elsewhere if these wells are shut in and other producers developed instead

32. The outcome of the surface facilities component is only moderately satisfactory because the reduced gas flow rates from the Rashidpur wells mean that these facilities can only make a modest contribution to the objective of increasing gas supply in Bangladesh. However, the ICR rating of unsatisfactory is not justified because 300 BCF of gas has been produced already. In addition, the drilling investment also led to the discovery of previously unknown gas sands, which have the potential to increase the ultimately recoverable reserves from the Rashidpur field.

33. At the time the ICR was written, the Supervisory Control and Data Acquisition (SCADA) component funded by DfID was unfinished because the contractor had gone bankrupt in the final stage of implementation and alternative arrangements had not been made. Hence the outcome of this component was assessed as unsatisfactory. Since then, the physical works have been completed, albeit with a 3+ year delay, and the system is now being tested and put into service. The SCADA system provides GTCL with a powerful, modern, real-time monitoring and control capability over the gas transmission network. But an essential complement of the SCADA system is that GTCL should have full operational authority over all the gas trunk lines operating above 900 psi. This has not yet occurred and the outcome of this component cannot therefore be considered to be fully satisfactory. At the time of the OED mission to Bangladesh, at least three such lines remained with the operating companies and two others had been transferred to GTCL on paper only, with the latter required to pay the original owners to operate them on its behalf.

34. As regards GIDP's two 'non-physical' objectives, the project did not succeed in promoting reforms to encourage private investment in gas⁹. Progress in improving the operational and managerial performance of the Petrobangla Group was limited (para.s. 44-48). Since only one of the project's three stated objectives - increasing gas supply - was fully met, the overall efficacy of GIDP is rated as modest.

9. However, a PHRD Trust Fund assisted with two investment promotion roundtable conferences hosted by Petrobangla in 1993 and 1997. They were highly successful and gave a major impetus to the opening of the gas sector to foreign private capital for exploration activities. Four production sharing contracts were signed in 1994-95 directly as a result of these promotional efforts, two more followed in 1997 and four PSCs were signed in 2000-01.

Efficiency

SGDP

35. According to the ICR¹⁰, the project has a high ex-post EIRR of 82 percent, only slightly lower than the appraisal estimate. Although this review was unable to verify the underlying assumptions used in the ICR to recalculate the EIRR, SGDP's high economic returns appear credible, given the volume of high-value gas and condensate streams to be produced over the lifetime of the investments. Hence the project's efficiency is evaluated as high.

GIDP

36. The ex-post EIRR of 20 percent as presented in the ICR values project benefits at prevailing tariffs¹¹ and is satisfactory. The estimate has been derived using the same 'time-slice' methodology as in the SAR and is only slightly lower than at appraisal. Valuing benefits at international oil prices instead of at GOB-administered gas prices would nearly double the EIRR. The project's efficiency is assessed as substantial.

Outcomes

SGDP

37. The project was unduly complex, performance was marred by numerous delays and contractual disputes and the project implementation unit (PIU) did not work as intended. Nevertheless, SGDP was successful in carrying out important investments in field appraisal and development and in transmission pipeline construction that enabled gas supply to be increased to the main users in the Dhaka area. It was highly relevant to sector needs, substantially met its objectives and was economically efficient in its use of investment capital. The overall outcome of SGDP is therefore assessed to be satisfactory.

GIDP

38. The outcome of GIDP is assessed as moderately unsatisfactory, despite the high relevance of its objectives and its contribution to increasing gas supplies. These do not outweigh the lack of progress in improving sector policies and the disappointing results in the project's equally important objective of institutional capacity building.

10. Details of the calculations of the EIRR were not provided in the ICR, although the SAR methodology appears to have been followed.

11. The methodology used in GIDP differs from that of SGDP. In addition, benefits under the latter were valued at oil-replacement, not at prevailing tariffs.

Sustainability

SGDP

39. The physical components dominated the project and are operating satisfactorily, over a decade after they went into service. There is little risk that they will not continue to be operated satisfactorily for the remainder of their economic life. Project sustainability is therefore assessed as highly likely.

GIDP

40. The physical assets acquired by the Petrobangla Group as part of the project are operating satisfactorily. GTCL is likely to ensure that the A-B pipeline will be properly maintained. Satisfactory maintenance and training arrangements have been made for the nearly-completed SCADA system. The sustainability of the project's net benefits is judged to be likely, given the proven track record of the PB Group under SGDP. However, the financial and institutional weakness of Petrobangla is a significant downside risk to overall long-term sustainability of the public sector gas industry.

Institutional Development

SGDP

41. At the time of appraisal, IDA was aware, as stated in the SAR, (a) that the record of project implementation in almost all sectors in Bangladesh had been weak, and (b) that the gas sector had been characterized by instability in management. IDA - in consultation with the other donors supporting this project - sought to isolate the project from such difficulties through a "centralized project unit concept", which was intended to provide an effective coordination of the various technical and financial contributions. The idea was for implementation responsibility to be entrusted by Petrobangla to an independent (PIU) placed under the authority of a project director satisfactory to IDA. The PIU was supposed to have adequate financial and administrative authority, with the project director reporting directly to the Chairman of Petrobangla.

42. In practice, this arrangement did not work as intended. There were frequent management turnovers in Petrobangla and within the PIU (four changes each during the most active period – 1988-91). The PIU did not have the necessary autonomy to take decisions, which were routinely passed on to the highest levels of Petrobangla and the Government, often through the use of committees. Decision-making thus became centralized, opaque and time-consuming. This particularly affected procurement decisions, as witnessed by the habitual delays, with many of the about one hundred supply, work and service contracts awarded beyond the original bid validity period. IDA was generally satisfied with the quality of the bidding documents, but problems frequently occurred in the subsequent processing, and there were also subsequent complaints from contractors of slow payments, as well as other disputes over contracts, staffing and performance. Especially in view of the time that has since passed, it is

difficult to pass judgment on the specific individual problems or complaints, but the overall picture is one of significant and persistent contract management problems within Bangladesh (the Government and Petrobangla). These difficulties continued to prevail during the implementation of the subsequent IDA-funded project in the sector.

43. The project's modest training efforts had little impact on the institutional development of the Petrobangla Group, which could have greatly benefited from a twinning type of arrangement with a more mature oil and gas corporation from another country. There appears to have been a lack of receptivity to technical assistance on the part of Petrobangla at that time and the proposal was dropped. The project does not appear to have helped improve Petrobangla's operational and management capability, which was one of its stated objectives. Hence, the ID impact is rated as negligible.

GIDP

44. The project's ID impact is rated as modest. Significant improvements in GTCL (para. 45), and modest improvements in Petrobangla's ability to deal with environmental and safety matters as a result of the project, are counterweighed by poor ID results in other GIDP components. The benefits from the (DfID-funded) TA to improve MIS systems, accounting and financial management do not appear to have been sustained. Crucial training programs were not implemented.

45. The three-year twinning arrangement for GTCL with GASCOR (Australia) was very successful and helped to develop the capabilities of this new entity, which at the time of Board approval of the project had barely begun to function. Today, GTCL transports over 5 BCM of gas through its pipelines, is strong in pipeline construction management, can design transmission pipelines and prepare bid documents without external help. It requires further strengthening (such as in SCADA operations) and needs to be able to improve the service conditions for its staff. Recent moves in this direction have been limited to the top management only.

46. The reservoir management study launched under the project had the potential to yield very significant technical, financial and institutional benefits to Petrobangla. The decision to abandon it after the GIDP loan was not extended was damaging to the development of the sector as a whole. Over three years have been unnecessarily lost since then. Today the lack of such a study is a bottleneck to further drilling in Petrobangla's own gas fields. The declining production from the Bakhrabad field alone justifies a specific study of this crucial reservoir. GOB and the Petrobangla Group as a whole could have jointly covered the cost from their own resources, given that only US\$3million was needed.

47. Reorganization of the gas sector along the lines first envisaged under SGDP and then under the ESAC has never been fully implemented. Local vested interests prevented the merger of the two gas producing companies into one. Although GTCL was set up in 1993, it still does not own all the high-pressure gas pipelines in Bangladesh, due to resistance to the pipeline transfers from the staff of the other operating companies.

48. The long-standing problem of insufficient operating company autonomy, the excessive GOB representation on operating company Boards, its control over procurement decisions, involvement in day to day operational matters (such as recruitment and the selection of candidates for training) has not eased to any significant extent during the past decade. Unsurprisingly, neither Petrobangla nor GOB have been keen to reduce their tight control over these entities and pressure from donors in this direction has been to no avail. A Petrobangla-appointed local consultant is expected to report imminently on the institutional relationships between the operating companies, Petrobangla and MEMR.

49. GIDP envisaged a major training program for the entire Petrobangla Group, but in the end none of it was implemented, due to poor performance by the consultants who designed the program, delays in approvals by Petrobangla and GOB and the Bank's decision to close the Credit just at the time when the training was about to begin. Fundamentally, this component lacked ownership on the part of Petrobangla, which should have been more proactive in the early years of GIDP to ensure that the training component was carried out expeditiously. Better results might have been achieved if the program had been designed on operating company rather than Petrobangla Group lines.

50. There has been a loss of skills from the Petrobangla Group during the past few years, in part to the private sector for better remuneration, but also because of the neglect of in-house training, which has suffered due to insufficient provision for it in Petrobangla's annual operating budget. Due to a slowdown in the capital expenditure program, mid-level staff have had less exposure to new projects than their predecessors in the 1980s, when the Petrobangla Group's operations were expanding more rapidly. No staff exchanges with IOCs or state oil companies like ONGC or Petronas have taken place. Petrobangla also faces a problem of succession planning at the level of its senior management. Its Petroleum Concessions Department is stretched to adequately carry out its supervisory responsibilities for PSC operations. In overall terms, the Petrobangla holding company seems to be a weaker entity than before the project. Building a strong Bangladeshi gas industry of international standard in the coming years will require much more effort to improve management, greatly increase training at all levels, offer better remuneration and grant more autonomy to the operating companies.

Bank Performance

SGDP

51. The over-complex project design and cofinancing arrangements were principally IDA's responsibility and contributed to implementation difficulties. An important component that was not part of the initial design, but was decided during project implementation (a gas fractionation plant at Ashuganj) was in the end not carried out, with grave consequences for the subsequent LPG transport and distribution project (Credit 2263-BD). The poor coordination and lack of realism within the Bank led to the premature approval of this new LPG project. Due to the failure to construct the Ashuganj

NGL fractionation plant, this project was ultimately canceled without being implemented -- an additional reason why this PPAR evaluates Bank performance as unsatisfactory.

GIDP

52. The Bank's involvement in the gas sector during the 1990s was extensive and varied, with different forms of overlapping interventions. Separating the impact of one from another is difficult and to some degree arbitrary. The assessment is further complicated by the active participation in the sector of other donors such as ADB and DfID, which were also pursuing similar objectives. Hence even the assigning of credit for particular results to one donor or another is subject to the same risks of arbitrariness.

The Bank Was Not Sensitive Enough to GOB's Constraints on gas exports

53. The Bank-GOB dialog on the issue of large-scale gas exports to India was difficult. The Bank was insensitive in not understanding the political constraints¹² faced by GOB, (regardless of which party was in power) and then was unwilling to admit that political factors could be such an obstacle to what the Bank took to be a very advantageous arrangement. Only recently has the Bank recognized that such exports would not yield massive revenues to GOB¹³. For several years, the Bank persisted in arguing that GOB should consider major gas exports, thereby created unnecessary tension/friction in the relationship. This also distracted attention from other approaches to sector development, such as a major push to develop internal gas markets, particularly in the West Zone, which was also poorly served with electricity. Bringing gas supply to the urban centers west of the Jamuna River would have had significant economic benefits and at the same time would have reduced resistance to gas exports. Once the gas transmission network is built to serve towns only a short distance from the Indian border, this may eventually lead to small-scale exports across the border, in a low-key, non-political setting.

Staff Turnover Undercut Bank Effectiveness

54. The project suffered from frequent changes in Bank staff, most particularly prior to the start of implementation. GIDP was prepared and appraised by one task manager, then post-appraised by a second TM, negotiated and presented to the Board by a third and then immediately handed over to a fourth TM. During the same period, there were also three changes of sector manager. Another change of TM and Sector Manager took place around the time of the mid-term review (MTR) and the TM changed again before final closure.

55. In the 2nd half of the 1990s, the Bank's Bangladesh energy team at HQ was predominantly new. These staff had no prior involvement in Bangladesh, were in tune

12. The only realistic market is India, with which Bangladesh has a politically delicate and complex relationship of unequal neighbors with close but difficult ties.

13. The HCU/ECON Gas Utilisation Study (September 2002) estimated a netback value of US\$1.50-2.10/mmbtu for exports of 250 MMCFD, yielding total benefits with a NPV of US\$400m over 20 years.

with the Bank's very pro-private sector stance of that époque and were ill at ease with GIDP, an 'old-style' project dominated by hardware investments and implemented entirely within the public sector. This was a contributory factor in the decline of the relationship between the Bank and Petrobangla/GOB. Personalities on both sides also played a large part in undermining the trust and collaborative attitudes necessary to overcome the difficulties in the dialog arising from the factors mentioned above.

56. The quality of project supervision appears to have declined after the mid-term review (MTR). Despite the clear signs of a lack of GOB/Petrobangla commitment to meet the project restructuring conditions proposed at the MTR, and the deteriorating sector finances in 1998-99, the supervision ratings in the PSRs remained unchanged, when declining performance should have been flagged to signal that the project was at risk. Closer involvement in project supervision by the field office would have been beneficial at this juncture, but task management responsibility remained at HQ until the very end of the project.

Soured Relationships and Differing Perspectives Prematurely Closed the Project

57. Meanwhile, Bank-GOB relations in the sector were souring, even though the Bank kept open its offer to retroactively finance the eligible costs of the W. Zone interconnector for two years after the MTR. However, GOB was unable or unwilling to take the necessary actions to unblock the IDA funding. This is hard to explain. Mutual antagonisms between Borrower and Bank staff were a contributory factor to the stalemate.

58. Six months before the closing date, IDA informed GOB that not only would the US\$47 million of cost savings be canceled, but that no extension would be granted either, despite the recognized importance of the training and reservoir management components. GOB's plea to the Bank to reconsider the matter (in the interests of carrying out these components) shortly before the closing date were to no avail. This PPAR was unable to find any documentary evidence in the Bank's archives to show the extent and type of internal debate on this matter and whether the full implications of the decision to refuse even a partial extension of the Credit had been assessed by the Bank.

59. In the light of the project's unsatisfactory quality at entry and the points discussed above, overall Bank Performance is evaluated as highly unsatisfactory.

Borrower Performance

SGDP

60. The poor experience during implementation with procurement and contract management, governmental interference, and lack of commitment to training and institutional development are the reasons for rating Borrower performance as unsatisfactory.

GIDP

Unsuccessful project restructuring to supply gas to Western Bangladesh

61. In 1997-98, GOB was keen to use the major savings under the project to construct a gas pipeline to the western part of Bangladesh, which was unserved by gas. The Jamuna bridge project was expected to cover the cost of laying a gas pipeline across the bridge concurrently with its construction, but additional resources were required to interconnect it with the existing transmission network and then extend it to consumers in the west, such as a new IPP in Baghabari. A restructuring of GIDP was proposed by the Bank at the time of the mid-term review in late 1997, to take advantage of the savings in the construction of the A-B pipeline. The proposal was a rational scheme to expand the high-pressure network, to serve priority consumers in the power sector (that would otherwise have to burn higher-cost, imported diesel) and had an attractive EIRR. Bank concurrence for the reallocation of GIDP funds depended upon GOB taking action on transfer of gas pipelines to GTCL and to raise gas prices that had been frozen for over three years, thereby declining by 20 percent in real terms. After a lengthy interval, during which GOB took very little action to meet IDA's conditions, it became clear that GOB was not willing to take politically unpopular steps to raise gas prices or to confront the staff of the other PB Group companies affected by pipeline transfers to GTCL. With hindsight, it also appears that the funding was not crucial to GOB, since the interconnection to the West Zone went ahead without IDA resources.

Lack of Government commitment to project goals

62. GOB was unwilling to find a solution to the transfer of transmission pipelines to GTCL. It referred the matter to a committee rather than seeking to break the logjam by taking the lead to hammer out a solution. This illustrates the lack of ownership of the objectives of GIDP on the part of GOB. GOB also did not take action to comply with financial covenants and did not take corrective action on gas prices, despite repeated reminders from IDA as well as other lenders. GOB also refused to discuss a major sector review on gas that the Bank had undertaken in 1998, on the grounds that it had not been consulted or involved in the work. While the latter is true, GOB's attitude meant that this high quality analytical work was entirely wasted.

Petrobangla's shortcomings

63. Even though some of the inordinate delays in project implementation were due to factors beyond Petrobangla's control, it is apparent that Petrobangla did not act expeditiously as regards the training program and reservoir management study. Furthermore, Petrobangla subsequently failed to make alternative arrangements to fund the training program and the reservoir management study during the three years since the IDA Credit was canceled. It would appear that the top management of Petrobangla either was unconvinced of the importance of these activities or was not willing to arrange alternative funds, either from internal or GOB sources to cover the shortfall.

64. For these reasons, overall Borrower performance is assessed as highly unsatisfactory.

Conclusions

65. Could the Bank's departure from the gas sector have been avoided, or the damage contained earlier? The situation in the gas sector was not unique. On the Bank side, the perception that the gas sector was unresponsive to change and resistant to reform was in keeping with a more general view held by the Region's top management that Bangladesh was a 'poor performer'. Total IDA assistance to the country had declined and the CAS 'low case' scenario was the basis for the lending program. This merely reinforced the energy team's conviction that it had to be "firm" in sticking to its reform agenda, and that GOB had to demonstrate results *before* IDA funds could flow.

66. The Bank management's decision not to extend the closing date even once is striking, but is in keeping with this frame of mind. It illustrates the extent to which relations in the sector between GOB and the Bank had deteriorated. The Bank had clearly lost all patience and one has to assume that the decision not to extend the Credit was clearly thought through and was intended to send a strong signal to GOB of the Bank's dissatisfaction and unwillingness to continue to assist a sector in which it had been present for over two decades. It thus seemed to signify an end to any Bank involvement in the sector for a prolonged period. If the purpose of the cancellation was to trigger a response in the form of an internal GOB/Petrobangla re-evaluation of sector management, it failed to lead to any noticeable alterations or improvements in sector performance.

67. An alternative approach would have been to just extend GIDP to cover the training component and reservoir management studies, both of which would have had a very positive institutional development impact. This had been recommended by the supervision mission just prior to the decision to maintain the original closing date. With hindsight, it might have been preferable to have provided a selective extension to the closing date, because that would also have kept open the door to a more active involvement in future, should circumstances change. Now that IDA is keen to increase lending for infrastructure projects and is once again receptive to the idea of financing projects in the gas sector, it has to recognize that an early re-engagement, in the absence of progress in policy matters since its pullout, would be seen as damaging to its credibility and limit its effectiveness in seeking reforms.

Lessons

68. The main lessons that emerge from the assessment of these two projects are:
- In designing institutional development components of projects, the incentives for those directly concerned by proposed changes should be well aligned with the project objectives. In particular, the staffing and remuneration implications of major institutional reorganizations (such as the creation of GTCL), need to be well understood and explicitly addressed if reorganizations are to be successfully implemented;

- Building a strong gas industry of international standard requires a major ID effort: better management, greatly increased training, better remuneration and more autonomy;
- The Bank should take a less dogmatic approach to sector reforms and practice greater sensitivity to local socio-political constraints, if it is to achieve collaborative dialog and succeed in obtaining Borrower 'buy-in' to its proposals.
- Strong and continuing field office involvement in substantive project work is more effective than intermittent, long-distance involvement of HQ staff.
- When the Bank finds it difficult to justify its support for a particular sector due to policy differences, it should strategically weigh the benefits of maintaining a flexible form of engagement against the consequences of full withdrawal. Repeated sharp changes in the Bank's involvement could be damaging to its credibility and could constrain its ability to seek policy reforms.

Annex A. Basic Data Sheet

SECOND GAS DEVELOPMENT PROJECT (CREDIT 1586-BD)

Key Project Data *(amounts in US\$million)*

	<i>Appraisal Estimate</i>	<i>Actual or current estimate</i>	<i>Actual as % of appraisal estimate</i>
IDA Credit	110.0	102.4	93
Cofinancing	83.0	88.2	106.0
Government	46.4	89.3	192.0
Total Project Costs	239.4	279.9	117.0

Cumulative Estimated and Actual Disbursements *(US\$millions)*

	<i>FY86</i>	<i>FY87</i>	<i>FY88</i>	<i>FY89</i>	<i>FY90</i>	<i>FY91</i>	<i>FY92</i>	<i>FY93</i>	<i>FY94</i>
Appraisal estimate	8.0	32.8	71.3	103.7	110.0				
Actual	6.13	7.78	8.86	17.98	73.98	97.62	113.68	115.93	113.20
Actual as % of estimate	77	24	12	17	67	89	104	105	103
Date of final disbursement: 1/12/1994									

Project Dates

	<i>Original</i>	<i>Actual</i>
Appraisal	April/May, 1994	July, 1984
Negotiations	February, 1985	February, 1985
Board presentation	April 30, 1985	April 30, 1985
Signing	May 2, 1985	May 2, 1985
Effectiveness	August 2, 1985	March 14, 1986
Closing date	June 30, 1990	December 31, 1993

Staff Inputs (*staff weeks*)

	<i>Actual weeks</i>	<i>Actual US\$000</i>
To appraisal	38.9	88.3
Appraisal through Board approval	87.7	190.7
Board approval through effectiveness, supervision and completion	219.6	466.1
Total	346.2	745.1

Mission Data

	<i>Date (month/year)</i>	<i>No. of persons</i>	<i>Staff days in field</i>	<i>Specializations represented</i>	<i>Performance rating</i>	<i>Types of problems</i>
Identification	March, 1983	-	-	-	N/A	N/A
Preparation	Nov. 2-18, 1983	3	7	2PE, EC	N/A	N/A
Appraisal	July, 1984	-	-	-	-	-
Supervision 1	April 16-27, 1985	2	11	FA, GE	1	N/A
Supervision 2	Sept. 30-Oct. 12, 1985	3	13	EC, FA, PE	-	-
Supervision 3	Nov. 27-Dec. 2, 1986	1	6	PE	2	P, T
Supervision 4	Mar. 1-16, 1987	1	16	PE	2	P, T
Supervision 5	Sept. 20-Oct. 9, 1987	2	20	GF, FA	2	P, T
Supervision 6	Dec. 8-22, 1987	2	15	EC, FA	2	P, T
Supervision 7	April 17-May 3, 1988	2	17	PE, FA	2	P, T
Supervision 8	Mar. 25-Apr. 13, 1989	2	20	PE, FA	2	P, T, AF
Supervision 9	Dec. 1-19, 1989	4	20	PE, EC, FA, GE	3	P, T
Supervision 10	May 14-31, 1990	1	13	PE	3	P, T
Supervision 11	May 4-28, 1991	3	25	PE, EC, FA	3	M, P, T, F

Staff abbreviations:

PE=Petroleum Engineer; GE=Geologist; PS=Procurement Specialist; FA=Financial Analyst; EC=Economist

Project Status Ratings:

1=No significant problems; 2=Moderate problems; 3=Major problems being addressed;

Problem Designation:

F=Financial; M=Managerial; T=Technical; P=Procurement; AF= Availability of funds.

GAS INFRASTRUCTURE DEVELOPMENT PROJECT (CREDIT 2720-BD)

Key Project Data *(amounts in US\$million)*

	<i>Appraisal Estimate</i>	<i>Actual or current estimate</i>	<i>Actual as % of appraisal estimate</i>
IDA Credit	120.80	67.90	56.00
Cofinancing	10.60	34.90	329.00
Government	30.20	32.00	106.00
Total Project Costs	161.60	134.80	83.41

Cumulative Estimated and Actual Disbursements *(US\$millions)*

	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>
Amount disbursed	16.6	16.4	4.1	12.0	9.9	1.8
Cumulative	16.6	33.1	44.2	56.2	66.1	67.9

Project Dates

	<i>Original</i>	<i>Actual</i>
Appraisal		06-09/1993
Negotiations		09/1994
Board presentation		05/09/1995
Signing		05/24/1995
Effectiveness		6/24/1995
Closing date	6/30/2000	6/30/2000

Staff Inputs *(staff weeks)*

	<i>Actual weeks</i>	<i>Actual US\$000</i>
Identification/Preparation	119.8	326.3
Appraisal/Negotiations	195.8	634.1
Supervision	220.9	431.1
ICR	23.52	26.6
Total	560.02	1418.1

Mission Data

	Date (month/year)	No. of persons	Specializations represented	Performance rating	
				Implementation status	Development objectives
Identification/ Preparation	November 1992	12	PROC, ECON, PGM (2) FNA, EGR CONS (6)		
	February 1993	2	EGR, FNA		
Appraisal/ Negotiation	September 1993	9	PGM, ECON (2), FNA, EGR (2), CONS (2), PROC		
	December 1993	6	ECON, EGR (3), PGM, CONS		
	April 1994	1	CONS		
	June 1994	3	PGM, EGR, CONS		
Supervision 1	September 1995	2	FNA, PGO	S	S
Supervision 2	April 1996	3	FNA, PGO, OPA	S	S
Supervision 3	October 1996	3	FNA, OPA, PGO	S	S
Supervision 4	June 1997	5	FNA, OPA, EGR (2) PGO	S	S
Supervision 5	October 1997	6	FNA, ECO, OPA, EGR (3)	S	S
Supervision 6	May 1998	3	EGR (2), CONS	S	S
Supervision 7	March 1999	4	EGR, PGM (2), FNA	S	S
Supervision 8 (Mid-term review)	December 1999	4	PGM, EGR, FNA, DISB	S	U
ICR	August 2000	3	PGM, FNA, DISB	S	U

ENG=Engineer; FNA=Financial Analyst; PGM=Program Manager; PROC=Procurement Specialist;
DISB=Disbursement; S=Satisfactory; U=Unsatisfactory

Annex B. Borrower Comments

“গ্যাস জাতীয় সম্পদ” এর অপচয় রোধ
করে জাতীয় দায়িত্ব পালন করুন।

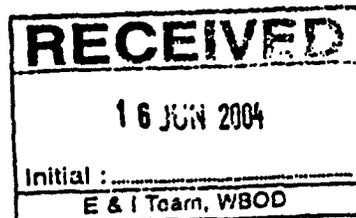


বাংলাদেশ তৈল, গ্যাস ও খনিজ সম্পদ কর্পোরেশন (পেট্রোবাংলা)
Bangladesh Oil, Gas & Mineral Corporation (Petrobangla)

No. 32.07.70/186

Dated : 15 -06-2004.

The Secretary
Energy and Mineral Resources Division
Ministry of Power, Energy and Mineral Resources
Bangladesh Secretariate
Dhaka-1000.



Attention : Begum Maksura Noor, Sr. Asstt. Secretary.

Sub: Comments of Petrobangla on Draft Project Performance Assessment Report of Second Gas Development Project (Cr. No.1586BD), Gas Infrastructure Development Project (Cr. No. 2720-BD) and Bangladesh-Energy Sector Adjustment Credit (Credit No.1999-BD).

Dear Sir,

Kindly refer to the World Bank letter of 17 May, 2004 addressed to the Secretary, Economic Relations Division along with the copy of Draft Project Performance Assessment Report of Second Gas Development Project (Cr. No.1586BD), Gas Infrastructure Development Project (Cr. No. 2720-BD) and Draft Project Performance Re-assessment Report of Bangladesh-Energy Sector Adjustment Credit (Credit No. 1999-BD). As desired necessary comment concerning Petrobangla is attached herewith for kind perusal and further necessary action.

Thanking you,

Sincerely Yours.

[Signature]
Major Md. Muqtadir Ali (Retd.)
Director (Planning)

Enclo : As stated above.

c.c.

1. ✓ Mr. Alain Barbu, Manager, Sector and Thematic Evaluation Group
Operation Evaluation Department, World Bank Office, 3A, Paribagh, Dhaka.
2. Manager (Co-ordination), Chairman Section, Petrobangla, Dhaka.

Comments of Petrobangla on Draft Project Performance Report of 2nd Gas Development Project (Cr. No. 1586-BD) and Gas Infrastructure Development Project (Cr. No.2720-BD).

Para no.	World Bank's Comments	Comments & observations by Petrobangla
1.	Natural gas is the principal source of commercial energy in Bangladesh, accounting for about 40 percent of the total energy supply and well over 60 percent of commercial energy consumption. The country's remaining proven and probable gas reserves are already large but could be substantially increased by field delineation and infill drilling in existing geological structures. The ratio of reserves to annual production is about 38 years, considerably higher than for most gas-producing countries.	At present 70% of the commercial energy is supplied by gas. Considering the present trend of demand proved plus proven reserve may cater demand of gas up to 2020 only. Therefore the comment may be reviewed accordingly.
2.	When the Second Gas Development Project (SGDP) was approved in the mid- 1980s, the gas industry in Bangladesh was still at an early stage of development. Six gas fields were in production, and of the country's total gas-in-place only a third was considered proven due to the modest amount of delineation drilling.	Agreed
3.	By 1985, the development of the gas sector had led to rapid growth in commercial energy use and a progressive decline in the share of commercial energy derived from (imported) liquid hydrocarbons. At that time, a main thrust of the energy policy was to reduce the dependence on oil imports by accelerating the development of the domestic gas resources (for power and for fertilizer) and increasing the economy's absorptive capacity for gas.	Agreed
4.	Subsequent developments have shown that the faith in the country's gas prospects was justified. Gas production has increased tenfold in the past 20 years, doubling over the past decade. Almost half of all gas produced in Bangladesh is consumed for power generation, which is now overwhelmingly gas-based (almost 90 percent). The fertilizer sector consumes over a fifth of gas production, while the remaining third is consumed by the industrial and residential users. The demand for gas to 2010 is expected to continue growing at 6 to 8 percent annually, driven by the robust growth in power demand and the low level of access to electricity in rural areas.	Demand of gas in Bangladesh will continue at the rate of 6 to 10% upto 2010.
5.	Since 1994, growth in the Bangladesh gas sector has been helped by foreign private companies operating under production sharing contracts (PSCs). Even so, there has been little systemic reform over the past 20 years. The sector is still largely dominated by the government, acting since the mid-1970s through Petrobangla, a state holding company with multiple subsidiaries.	Petrobangla is a corporation and owns exploration, production, transmission and distribution companies on behalf of GOB.
6.	Petrobangla (PB) is responsible for the exploration and development of Bangladesh's oil, gas and mineral resources. It has been a statutory body of the government since 1985, operating under the purview of the Ministry of Energy and Mineral Resources. It holds the shares of all the state-owned companies dealing in oil, gas and mineral exploration and development (now nine in number for gas, plus two for solid minerals) on the Government's behalf. In the mid-1980s the PB Group consisted of three production companies, and two transmission and distribution companies. An exploration company (BAPEX) and natural gas liquids company (RPGCL) were set up in the late 1980s and the gas transmission	Instead of two transmission and distribution companies it should be three transmission and distribution companies

	company (GTCL) was created in the early 1990s. A distribution company to supply gas to consumers west of the Jamuna River was set up in 1999.	
7.	<p>Project Objectives, Components and Design</p> <p>The Second Gas Development project and Gas Infrastructure Development project had several common objectives and are treated in this report as a series. The later project has been given greater emphasis than the first in the analysis because the SGDP was completed over a decade ago and the evidentiary trail on it has been somewhat overwritten by the outcomes of the GIDP. Furthermore, the legacy of actions taken by the Bank in the last year of the GIDP continues to be relevant for any new World Bank assistance in the gas sector</p>	Agreed
8.	The objectives of the Second Gas Development project were to (a) increase gas supply to reduce shortages; (b) to evaluate the gas reserves to provide a basis for long-term gas field development; and (c) to strengthen the operational and management capability of the Petrobangla Group companies.	Agreed
9.	<p>The main project components were:</p> <ul style="list-style-type: none"> • Gas Field Development: The initial development of northeastern gas fields (Kailashtila and Beani Bazar), primarily supplying the Dhaka area, through the drilling of appraisal wells, together with the workovers of two existing wells at Rashidpur (US\$ 23 million). • Gas Field Appraisals: Initial appraisal wells at four main gas fields (Bakhrabad, Titas, Habiganj, and Rashidpur) (US\$ 33 million). • Gas Infrastructure Development: Gas and condensate treatment facilities at Kailashtila, Beani Bazar, and Rashidpur, a gas pipeline north-south from Kailashtila via Beani Bazar and Rashidpur to Ashuganj, and a condensate pipeline from Beani Bazar to Kailashtila. (US\$ 174 million) • Reservoir engineering studies of eight gas fields. 	Agreed
10	<p>The effort to expedite the development of gas resources in Bangladesh and to bring the gas to the market in the shortest possible time, made project design unduly complex. It was complex and difficult to administer and vulnerable to cascading delays in implementation - a risk that was not fully appreciated at the time of appraisal:</p> <ul style="list-style-type: none"> • First, the project was undertaken without firm knowledge of the potential of the relevant gas fields, information that would be provided by the appraisal wells. Given the evident potential of the Bangladeshi gas fields, it was appropriate for the project to incur the risk that this drilling inevitably implied, and the results were on the whole very positive. • Second, major components of the project were dependent on a sequence of events with the risk of cascading delays: (i) the drilling of the appraisal wells, to be undertaken under a contract financed by CIDA (Canada); (ii) the evaluation of these results to determine gas reserves (iii) the design of the gas pipelines and gas treatment plans; and (iv) the construction of these gas treatment and distribution facilities. • Third, the resulting size of the project required substantial cofinancing. The total project cost was estimated at appraisal at \$221 million equivalent, of which IDA was to contribute \$110 million and bilateral co-financiers (Canada, UK, Netherlands and UNDP) a combined total of \$ 83 million. GOB's contribution was to be \$28 	Agreed

	<p>million. While the co financiers cooperated well throughout the period of the project, the numerous agreements that were required between the individual cofinanciers and the Government, and between the cofinanciers themselves, inevitably added to the complexity of the project.</p>	
11.	<p>Even in the absence of the procurement problems that dogged this project, a simpler, multi-project structure would have preferable. The appraisal drilling, analysis of results and design of the subsequent investments could have comprised an initial operation, with a second, a follow-on project that could have supported the priority investments in field facilities, pipeline and gas fractionation based on fully prepared and mutually agreed investment plans. This would have permitted each project to be prepared in more final form prior to approval, and reduced the administrative burden on the project entities in Bangladesh.</p>	Agreed
12.	<p>The objectives of the Gas Infrastructure Development project were to (a) alleviate the worsening gas supply shortages through partially financing the sector's priority investments; (b) assist in implementing further reforms to improve the enabling environment for private sector participation in the sector; and (c) develop the gas sector entities' institutional capabilities, particularly in the areas of operations and maintenance, safety, environmental protection, accounting, and financial management.</p>	Agreed
13.	<p>The main project components were:</p> <ul style="list-style-type: none"> • A gas pipeline from Ashuganj to Bakhrabad (US\$ 55 million). • A Supervisory Control and Data Acquisition (SCADA) and pipeline telecommunication system for the entire Petrobangla Group gas transmission trunkline from Kailashtilla to Chittagong (US\$ 30 million). • Three production wells at Rashidpur gas field (US\$17 million). • A gas processing plant to purify gas from the new wells (US\$ 15 million). • Technical assistance for (i) project implementation, (ii) building institutions to develop managerial and technical capabilities of the newly created Gas Transmission Company Limited (GTCL), establish a group-wide environmental and safety management system, strengthen Petrobangla's reservoir management capability, and improve the management systems of the Petrobangla Group; and (iii) training of Petrobangla staff in key aspects of gas sector operations (US\$ 19 million). 	Agreed

from

14.	<p>GIDP Design</p> <p>The project did not include any component, actions or loan conditionality to further the private sector development objective (para 12 (b) above), although the Bank had had an ongoing dialog with GOB since the Energy Sector Adjustment Credit (ESAC, 1989-91) on the measures to improve the enabling environment for private investment in the gas sector. An accompanying PHRD Trust Fund permitted a wide range of gas sector analysis to be carried out and assisted with GOB's promotional activities directed at international oil companies (IOCs). Advice from the Bank also contributed to the publication in mid 1993 of a new petroleum policy by GOB, with liberalized contractual terms for production sharing contracts (PSCs) with international oil companies. The latter had already begun to invest in exploration before Board approval of GIDP. It could therefore argued that the appraisal process for GIDP had already accomplished a significant breakthrough in improving the environment for PSD. Nevertheless, there remained other sectoral issues which remained unaddressed, but again, these were being tackled outside the framework of GIDP.</p>	Agreed
15.	<p>For example, preparatory work for a suitable regulatory framework (i.e., to divest part of the GOB shareholdings in the Petrobangla operating companies and the replacement of civil servants on operating company Boards by directors from the private sector) was expected to be undertaken as part of an ADB project that was already being implemented. These factors may help to explain the omission of any specific PSD component from the design of GIDP, but it was evidently inappropriate to include an explicit PSD objective without any accompanying project elements. Objective (b) on further reforms and private participation should have been dropped at the time of the mid-term review, or alternatively, the project could have been restructured to explicitly incorporate a component designed to further it, particularly as the actions expected under the ADB project did not materialize.</p>	Agreed
16.	<p>Another significant omission from the GIDP conditionality was a dated timetable for the transfer to GTCL of high-pressure pipelines from the other operating companies. This was a contentious issue which was a frequent irritant in the Bank's relationship with GOB/Petrobangla throughout the 1990s, and which was a contributory factor in the decision not to extend the closing date of GIDP (para 57). The IDA-funded North-South and Ashuganj-Bakhrabad pipelines could not be operated by GTCL in isolation from the rest of the high-pressure transmission system, over which GTCL lacked control. In addition, full operational responsibility in the hands of GTCL was a <i>sine qua non</i> for the SCADA component of GIDP. Despite this, the project design did not include the preparatory steps for pipeline transfers such as asset valuation and study of the staffing and remuneration implications for both the new company as well as the existing operating companies, which were to 'loss' part of their facilities to GTCL .</p>	Agreed
17.	<p>More consultation and a broader- debate on the issue of pipeline transfers to GTCL with the staff and management of the affected operating companies during the appraisal process may have helped to smooth the way for these to occur. At the very least, the Bank would have gained a better Understanding of the reasons for the</p>	Agreed

	resistance from the operating companies and more effort could have gone to finding a solution acceptable to all parties.	
18.	In light of the above points, this PAR shares the ICR's assessment of the project's quality at entry as unsatisfactory.	Agreed
19	<p>Relevance of Objectives</p> <p>SGDP</p> <p>IDA's policy views in the mid-1980s were embedded in the formulation of its strategy for the oil and gas sector, which was described as follows in the SAR for SGDP:</p> <p>(a) to build up the capability of GOB in the formulation of adequate policies;</p> <p>(b) to promote a more efficient operation of the public sector enterprises in the sector;</p> <p>(c) to encourage the development of the gas sector by introducing modern technology and field management practices, through the acquisition of seismic data, appraisal drilling and reservoir studies;</p> <p>(d) to maximize the absorptive capacity of the economy for natural gas; and to support exploration promotion to the international oil industry.</p>	Agreed
20	This was a normal IBRD/IDA approach for a developing country's petroleum sector in the mid to late 1980s, - seeking to enhance the quality and competence of the domestic institutions (government and state corporations), supporting key productive investments by these entities, improving policies (particularly pricing), and encouraging foreign investment in the risky exploration for new reserves, but not seeking fundamental changes in the industrial structure, organizational framework and ownership of the hydrocarbons sector.	Agreed
21.	Within this context, SGDP mainly addressed the upstream development of the gas sector «c) a bove) through specific high priority investments and corporate strengthening (through training and technical assistance). The Energy Sector Adjustment Credit, which was implemented during 1987-90 (thus overlapping with SGDP), sought the strengthening of the Petrobangla Group by means of an institutional reorganization, based on studies carried out as part of SGDP. Both of these lending operations had covenant concerning gas prices. Gas pricing and sector finances are discussed in more detail in the Reassessment Report for ESAC, which was prepared concurrently with this PPAR.	Agreed
22.	The objectives of SGDP were highly relevant throughout the project's life and beyond. They remain so today, twenty years after the project was appraised in mid-1984. Expansion of gas supplies, appraisal of existing Petrobangla gas fields and strengthening of the Petrobangla Group of companies are still high sectoral priorities.	Agreed
23.	<p>GIDP</p> <p>GIDP's roots go back to 1990, when the project was first identified. It retained its 1980s flavor' despite the 5-year period to Board approval in 1995. As such, it contained - little in the way of sectoral transformation, such as divestiture of assets, or private financing of gas pipelines. The Bank team that took over responsibility for the energy portfolio midway through implementation (in 1998) was uncomfortable with GIDP as initially designed.</p>	Agreed
24.	The objectives of GIDP as spelt out in the SAR were highly relevant to the issues in the gas sector and remain so today. Reforms to improve the	Agreed

	environment for private investment in the sector and institutional capacity building within the Petrobangla Group still deserve priority. However, GDP should probably have had a stronger sector policy and organizational reform focus right from the start. These lacunae became problematic mid-way through implementation. During supervision, the Bank team attempted to tackle big sectoral policy issues without a suitable lending instrument or conditionality with which to engage GOB.	
25.	Efficacy SGDP. Despite major delays due to the complex project design and repeated problems of procurement and contract management (para 42), the project ultimately exceeded its objective of increasing gas supply. The ICR states that at the end of 1995, there were eight operating wells producing at a rate of 90 BCF of natural gas and 0.4 million barrels of condensate per annum, an estimates at that time assumed a cumulative gas production from the project through 2007/08 of 1.8 TCF, double the estimate at appraisal, and also an increase in condensate production. The North-South gas pipeline that was built under SGDP is an integral segment of the main GTCL high-pressure gas transmission system, linking the Dhaka area to gas fields in the north east.	Agreed
26	The reservoir engineering study carried out under SGDP was extremely valuable and led to the tripling of the estimate of Bangladesh's proven + probable gas reserves from 4 to 12 TCF. Although in great need of updating, it remains the sole basis for Petrobangla's analysis and planning of field development programs.	Out come of the SGDP has increased the gas reserve scenario of Bangladesh but not tripled (proved + probable gas reserve = 12 TCF) the reserve. The para may be revised accordingly.
27.	However, SGDP only had a minor impact on operational performance of the implementing agencies. Covenants to the Credit for SGDP obliged GoB to introduce gas price increases in 1985 and-1986, with annual adjustments as necessary beginning in1988. Partial compliance was achieved in FY88, FY89 and FY90, and the covenant was deemed complied with in FY92, at which time natural gas prices for all consumer groups had been brought up to or above the then estimates of the economic cost of gas supply. Thereafter GOB was increasingly reluctant to take action to maintain gas prices at least constant in real terms and price adjustment were in frequent and insufficient to compensate for inflation. Finances of the Petrobangla Group suffered as a result.	Agree
28.	Since SGDP satisfactorily met two of the three stated project objectives - increased gas supply and evaluation of gas reserves, the efficacy of the project is evaluated as substantial	Agree
29.	The physical components of GDP were designed to increase gas supply. They have partially succeeded in doing so. The Ashuganj to Bakhrabad pipeline was successfully completed at a cost considerably less than appraised. At the time the ICR was written in 2000, gas flows through the Ashuganj-Bakhrabad pipeline averaged under 100 MMCFD, much less than expected at appraisal, due to the unforeseen supply from the Sangu offshore gas field to Chittagong. However, since then there has been a sharp increase in the utilization of the pipeline to supply Dhaka as well as the large new Independent Power Producers (IPPs) at Haripur and	Agree

	<p>Meghnaghat. Without this line, Petrobangla would also be unable to meet the demand of the KAFCO fertilizer plant. The current flow rate is about 220 MMCFD, or about 50 percent of the installed capacity. The commissioning of the Maulavi Bazar field and supply from an additional six wells being drilled in existing fields will lead to a further rise in the flow rate of about 75-100 MMCFD from 2005. Concerns about the oversizing of the pipeline therefore seem to be misplaced since such investments are necessarily 'lumpy' and therefore are underutilized in the initial years of operation. OED does <i>not</i> concur with the ICR rating that the outcome of this Ahuganj-Bakhrabad pipeline component is Unsatisfactory.</p>	
30.	<p>Based on the geological and geophysical work undertaken by the reservoir study by the firm IKM, the three wells drilled in the Rashidpur field were expected to produce 90 MMCFD of gas. The maximum combined flow rate from the wells during testing was 71 MMCFD. But once production started, flow rates fell sharply and today they produce only about 30 MMCFD. Since only four wells had been drilled in the field prior to GIDP, the field's geology was poorly understood. Hence, given the technical knowledge available at the time of appraisal, it is difficult to see how this outcome could have been avoided. After completing these three wells, it was found that the geophysical/geological interpretations in the IKM study regarding the reservoir sands did not match the actual strata discovered by drilling. This is unsurprising. In reality, the three wells drilled under GIDP were more in the nature of field appraisal wells, rather than purely for production. 3-Dimensional seismic work to better understand the geological structure has still to be carried out on this field.</p>	Agree
31.	<p>While the outcome is disappointing, it is part of the normal risks inherent in the hydrocarbons business and the Petrobangla Group has had a low failure rate so far by international standards. With hindsight, it appears that it would have been better to award the contracts for the surface processing facilities only after well performance had been verified. But given the delays to this component, the few instances of poor performing producer wells in the past and the pressing need for gas, it is easy to see why this was not done. In any event, the surface facilities can be relocated and used elsewhere if these wells are shut in and other producers developed instead.</p>	Agreed
32.	<p>The outcome of the surface facilities component is only moderately satisfactory because the reduced gas flow rates from the Rashidpur wells mean that these facilities can only make a modest contribution to the objective of increasing gas supply in Bangladesh. However, the ICR rating of unsatisfactory is not justified because 300 BCF of gas has been produced already. In addition, the drilling investment also led to the discovery of previously unknown gas sands, which have the potential to increase the ultimately recoverable reserves from the Rashidpur field.</p>	Agreed
33.	<p>At the time the ICR was written, the Supervisory Control and Data Acquisition (SCADA) component funded by DfID was unfinished because the contractor had gone bankrupt in the final stage of implementation and alternative arrangements had not been made. Hence the outcome of this component was assessed as unsatisfactory. Since then, the physical works have been completed, albeit with a 3+ year delay, and the system is now being tested and put into service. The SCADA system provides GTCL with a powerful, modern, real-time</p>	So far three trunk line transferred.

	<p>monitoring and control capability over the gas transmission network. But an essential complement of the SCADA system is that GTCL should have full operational authority over all the gas trunk lines operating above 900 psi. This has not yet occurred and the outcome of this component cannot therefore be considered to be fully satisfactory. At the time of the OED mission to Bangladesh, at least three such lines remained with the operating companies and two others had been transferred to GTCL on paper only, with the latter required to pay the original owners to operate them on its behalf.</p>	
34.	<p>As regards GIDP's two 'non-physical' objectives, the project did not succeed in promoting reforms to encourage private investment in gas. Progress in improving the operational and managerial performance of the Petrobangla Group was limited (paras. 44-48). Since only one of the project's three stated objectives - increasing gas supply - was fully met, the overall efficacy of GIDP is rated as modest.</p>	Agreed
35	<p>Efficiency SGDP</p> <p>According to the ICR, the project has a high ex-post EIRR of 82 percent, only slightly lower than the appraisal estimate. Although this review was unable to verify the underlying assumptions used in the ICR to recalculate the EIRR, SGDP's high economic returns appear credible, given the volume of high-value gas and condensate streams to be produced over the lifetime of the investments. Hence the project's efficiency is evaluated as high.</p>	Agreed
36.	<p>GIDP</p> <p>The ex-post EIRR of 20 percent as presented in the ICR values project benefits at prevailing tariffs and is satisfactory. The estimate has been derived using the same 'time-slice' methodology as in the SAR and is only slightly lower than at appraisal. Valuing benefits at international oil prices instead of at GOB-administered gas prices would nearly double the EIRR. The project's efficiency is assessed as substantial.</p>	Agreed
37.	<p>Outcomes SGDP</p> <p>The project was unduly complex, performance was marred by numerous delays and contractual disputes and the PIU did not work as intended. Nevertheless, SGDP was successful in carrying out important investments in field appraisal and development and in transmission pipeline construction that enabled gas supply to be increased to the main users in the Dhaka area. It was highly relevant to sector needs, substantially met its objectives and was economically efficient in its use of investment capital. The overall outcome of SGDP is therefore assessed to be satisfactory.</p>	Agreed
38	<p>GIDP</p> <p>The outcome of GIDP is assessed as moderately unsatisfactory, despite the high relevance of its objectives and its contribution to increasing gas supplies. These do not outweigh the lack of progress in improving sector policies and the disappointing results in the project's equally important objective of institutional capacity building.</p>	Agreed
39	<p>Sustainability SGDP</p> <p>The physical components dominated the project and are operating satisfactorily, over a decade after they went into service. There is little risk that they will not continue to be operated satisfactorily for the remainder of their economic life. Project sustainability is therefore assessed as highly likely.</p>	Agreed

40.	<p>GIDP</p> <p>The physical assets acquired by the Petrobangla Group as part of the project are operating satisfactorily. GTCL is likely to ensure that the A-B pipeline will be properly maintained. Satisfactory maintenance and training arrangements have been made for the nearly-completed SCADA system. The sustainability of the project's net benefits is judged to be likely, given the proven track record of the PB Group under SGDP. However, the financial and institutional weakness of Petrobangla is a significant downside risk to overall long-term sustainability of the public sector gas industry.</p>	Agreed
41.	<p>At the time of appraisal, IDA was aware, as stated in the SAR, (a) that the record of project implementation in almost all sectors in Bangladesh had been weak, and (b) that the gas sector had been characterized by instability in management. IDA - in consultation with the other donors supporting this project - sought to isolate the project from such difficulties through a "centralized project unit concept", which was intended to provide an effective coordination of the various technical and financial contributions. The idea was for implementation responsibility to be entrusted by Petrobangla to an independent project implementation unit (PIU) placed under the authority of a project director satisfactory to IDA. The PIU was supposed to have adequate financial and administrative authority, with the project director reporting directly to the Chairman of Petrobangla.</p>	Agreed
42.	<p>In practice, this arrangement did not work as intended. There were frequent management turnovers in Petrobangla and within the PIU (four changes each during the most active period 1988-91). The PIU did not have the necessary autonomy to take decisions, which were routinely passed on to the highest levels of Petrobangla and the Government, often through the use of committees. Decision-making thus became centralized, opaque and time-consuming. This particularly affected procurement decisions, as witnessed by the habitual delays, with many of the about one hundred supply, work and service contracts awarded beyond the original bid validity period. IDA was generally satisfied with the quality of the bidding documents, but problems frequently occurred in the subsequent processing, and there were also subsequent complaints from contractors of slow payments, as well as other disputes over contracts, staffing and performance. Especially in view of the time that has since passed, it is difficult to pass judgment on the specific individual problems or complaints, but the overall picture is one of significant and persistent contract management problems within Bangladesh (the Government and Petrobangla). These difficulties continued to prevail during the implementation of the subsequent IDA-funded project in the sector.</p>	Agreed
43	<p>The project's modest training efforts had little impact on the institutional development of the Petrobangla Group, which could have type of arrangement with a more mature oil and gas corporation from another country. There appears to have been a lack of receptivity to technical assistance on the part of Petrobangla at that time and the proposal was dropped. The project does not appear to have helped improve Petrobangla's operational and management capability, which was one of its stated objectives. Hence, the ID impact is rated as negligible.</p>	Agreed

44.	<p>GIDP The project's ID impact is rated as modest. Significant improvements in GTCL (para 45), and modest improvements in Petrobangla's ability to deal with environmental and safety matters as a result of the project, are counterweighed by poor ill results in other GillP components. The benefits from the (DfID-funded) TA to improve MIS systems, accounting and financial management do not appear to have been sustained. Crucial training programs were not implemented.</p>	Agree
45.	<p>The three-year twinning arrangement for GTCL with OASCOR (Australia) was very successful and helped to develop the capabilities of this new entity, which at the time of Board approval of the project had barely begun to function. Today, GTCL transports over 5 BCM of gas through its pipelines, is strong in pipeline construction management, can design transmission pipelines and prepare bid documents without external help. It requires further strengthening (such as in SCADA operations) and needs to be able to improve the service conditions for its staff. Recent moves in this direction have been limited to the top management only.</p>	Agree
46.	<p>The reservoir management study launched under the project had the potential to yield very significant technical, financial and institutional benefits to Petrobangla. The decision to abandon it after the GIDP loan was not extended was damaging to the development of the sector as a whole. Over three years have been unnecessarily lost since then. Today the lack of such a study is a bottleneck to further drilling in Petrobangla's own gas fields. The declining production from the Bakhrabad field alone justifies a specific study of this crucial reservoir. GOB and the Petrobangla Group as a whole could have jointly covered the cost from their own resources, given that only US\$3million was Needed.</p>	Agreed
47.	<p>Reorganization of the gas sector along the lines first envisaged under SGDP and then under the ESAC has never been fully implemented. Local vested interests prevented) the merger of the two gas producing companies into one. Although GTCL was set up in 1993, it still does not own all the high-pressure gas pipelines in Bangladesh, due to resistance to the pipeline transfers from the staff of the other operating companies.</p>	Agreed
48.	<p>The long-standing problem of insufficient operating company autonomy, the excessive GOB representation on operating company Boards, its control over procurement decisions, involvement in day to day operational matters (such as recruitment and the selection of candidates for training) has not eased to any significant extent during the past decade. Unsurprisingly, neither Petrobangla nor GOB have been keen to reduce their tight control over these entities and pressure from donors in this direction has been to no avail. A Petrobangla-appointed local consultant is expected to report imminently on the institutional relationships between the operating companies, Petrobangla and MEMR.</p>	Agreed
49.	<p>GIDP envisaged a major training program for the entire Petrobangla Group, but in the end none of it was implemented, due to poor performance by the consultants who designed the program, delays in approvals by Petrobangla and GOB and the Bank's; decision to close the Credit just at the time when the training was about to begin. Fundamentally, this component lacked ownership on the part of Petrobangla, which should have been more proactive in the early years of GIDP to ensure that the training component was carried out expeditiously. Better results might have been achieved if the program had been designed on operating company rather than Petrobangla Group lines.</p>	Agreed
50.	<p>There has been a loss of skills from the Petrobangla Group during the</p>	Agreed

	<p>past few years, in part to the private sector for better remuneration, but also because of the neglect of in-house training, which has suffered due to insufficient provision for it in Petrobangla's annual operating budget. Due to a slowdown in the capital expenditure program, mid-level staff have had less exposure to new projects than their predecessors in the 1980s, when the Petrobangla Group's operations were expanding more rapidly. No staff exchanges with IOCs or state oil companies like ONGC or Petronas have taken place. Petrobangla also faces a problem of succession planning at the level of its senior management. Its Petroleum Concessions Department is stretched to adequately carry out its supervisory responsibilities for PSC; operations.. In overall terms, the Petrobangla holding company seems to be a weaker entity than before the project. Building a strong Bangladeshi gas industry of international standard in the coming years will require much more effort to improve management, greatly increase training at all levels, offer better remuneration and grant more autonomy to the operating companies.</p>	
51.	<p>Bank Performance SGDP</p> <p>The over-complex project design and cofinancing arrangements were principally IDA's responsibility and contributed to implementation difficulties. An important component that was not part of the initial design, but was decided during project implementation (a gas fractionation plant at Ashuganj) was in the end not carried out, with grave consequences for the subsequent LPG transport and distribution project <i>I (Credit 2263-BD)</i>. <i>The poor coordination and lack of realism within the Bank led to the premature approval of this new LPG project. Due to the failure to construct the Ashuganj NGL fractionation plant, this project was ultimately canceled without being implemented -- an additional reason why this PPAR evaluates Bank performance as unsatisfactory.</i></p>	Agreed
52.	<p>GDP</p> <p>The Bank's involvement in the gas sector during the 1990s was extensive and varied, with different forms of overlapping interventions. Separating the impact of one from another is difficult and to some degree arbitrary. The assessment is further complicated by the active participation in the sector of other donors such as ADB and DfID, which were also pursuing similar objectives. Hence even the assigning of credit for particular results to one donor or another is subject to the same risks of arbitrariness.</p>	Agreed
53.	<p>The Bank Was Not Sensitive Enough to GOB's Constraints on gas export</p> <p>The Bank-GOB dialog on the issue of large-scale gas exports to India was difficult. The Bank was insensitive in not understanding the political constraints faced by GOB, (regardless of which party was in power) and then was unwilling to admit that political factors could be such an obstacle to what the Bank took to be a very advantageous arrangement. Only recently has the Bank recognized that such exports would not yield massive revenues to GOB. For several years, the Bank persisted in arguing that GOB should consider major gas exports, thereby created unnecessary" tension/friction in the relationship. This also distracted attention from other approaches to sector development, such as a major push to develop internal gas markets, particularly in the West Zone, which was also poorly served with electricity. Bringing gas supply to the urban centers west of the Jamuna River would have had significant</p>	Bank should come forward for implementation of extensive Gas network in the Western Part of Bangladesh for earliest implementation of the poverty eradication programme of GOB.

	economic benefits and at the same time would have reduced resistance to gas exports. Once the gas transmission network is built to serve towns only a short distance from the Indian border, this may eventually lead to small-scale exports across the border, in a low-key, non-political setting.	
54.	<p><i>Staff Turnover Undercut Bank Effectiveness</i></p> <p>The project suffered from frequent changes in Bank staff, most particularly prior to the start of implementation. GDP was prepared and appraised by one task manager, then post-appraised by a second TM, negotiated and presented to the Board by a third and then immediately handed over to a fourth TM. During the same period, there were also three changes of sector manager. Another change of TM and Sector Manager took place around the time of the mid-term review (MTR) and the TM changed again before final closure</p>	Agreed
55.	In the 2nd half of the 1990s, the Bank's Bangladesh energy team at HQ was predominantly new. These staff had no prior involvement in Bangladesh, were in tune with the Bank's very pro-private sector stance of that epoch and were ill at ease with GDP, an 'old-style' project dominated by hardware investments and implemented entirely within the public sector. This was a contributory factor in the decline of the relationship between the Bank and Petrobangla/GOB. Personalities on both sides also played a large part in undermining the trust and collaborative attitudes necessary to overcome the difficulties in the dialog arising from the factors mentioned above.	Agreed
56.	The quality of project supervision appears to have declined after the mid-term review (MTR). Despite the clear signs of a lack of GOB/Petrobangla commitment to meet the project restructuring conditions proposed at the MTR, and the deteriorating sector finances in 1998-99, the supervision ratings in the PSRs remained unchanged, when declining performance should have been flagged to signal that the project was at risk. Closer involvement in project supervision by the field office would have been beneficial at this juncture, but task management responsibility remained at HQ until the very end of the project.	Agreed
57.	<p><i>Soured Relationships and Differing Perspectives Prematurely Closed the Project</i></p> <p>Meanwhile, Bank-GOB relations in the sector were souring, even though the Bank kept open its offer to retroactively finance the eligible costs of the W. Zone interconnector for two years after the MTR. However, GOB was unable or unwilling to take the necessary actions to unblock the IDA funding. This is hard to explain. Mutual antagonisms between Borrower and Bank staff were a contributory factor to the stalemate.</p>	Agreed
58.	Six months before the closing date, IDA informed GOB that not only would the \$47 million of cost savings be canceled, but that no extension would be granted either, despite the recognized importance of the training and reservoir management components. GOB's plea to the Bank to reconsider the matter (in the interests of carrying out these components) shortly before the closing date were to no avail. This PPAR was unable to find any documentary evidence in the Bank's archives to show the extent and type of internal debate on this matter and whether the full implications of the decision to refuse even a partial extension of the Credit had been assessed by the Bank.	Agreed

59.	In the light of the project's unsatisfactory quality at entry and the points discussed above, overall Bank Performance is evaluated as highly unsatisfactory.	Agreed
60.	<p>Borrower Performance SGDP</p> <p>The poor experience during implementation with procurement and contract management, governmental interference, and lack of commitment to training and institutional development are the reasons for rating Borrower performance as unsatisfactory.</p>	Borrower performance could have been improved if the implementing agency had been given greater latitude in the implementation/performance decisions & responsibilities.
61.	<p>GIDP <i>Unsuccessful project restructuring to supply gas to Western Bangladesh</i></p> <p>In 1997-98, GOB was keen to use the major savings under the project to construct a gas pipeline to the western part of Bangladesh, which was unserved by gas. The Jamuna bridge project was expected to cover the cost of laying a gas pipeline across the bridge concurrently with its construction, but additional resources were required to interconnect it with the existing transmission network and then extend it to consumers in the west, such as a new IPP in Baghabari. A restructuring of GIDP was proposed by the Bank at the time of the mid-term review in late 1997, to take advantage of the savings in the construction of the A-B pipeline. The proposal was a rational scheme to expand the high-pressure network, to serve priority consumers in the power sector (that would otherwise have to burn higher-cost, imported diesel) and had an attractive EIRR. Bank concurrence for the reallocation of GIDP funds depended upon GOB taking action on transfer of gas ~ pipelines to GTCL and to raise gas prices that had been frozen for over three years, thereby declining by 20 percent in real terms. After a lengthy interval, during which GOB took very little action to meet IDA's conditions, it became clear that GOB was not willing to take politically unpopular steps to raise gas prices or to confront the staff of the other PB Group companies affected by pipeline transfers to GTCL. With hindsight, it also appears that the funding was not crucial to GOB, since the interconnection to the West Zone went ahead without IDA resources.</p>	Agreed
62.	<p><i>Lack of Government commitment to project goals</i></p> <p>GOB was unwilling to find a solution to the transfer of transmission pipelines to GTCL. It referred the matter to a committee rather than seeking to break the logjam by taking the lead to hammer out a solution. This illustrates the lack of ownership of the objectives of GIDP on the part of GOB. GOB also did not take action to comply with financial covenants and did not take corrective action on gas prices, despite repeated reminders from IDA as well as other lenders. GOB also refused to discuss a major sector review on gas that the Bank had undertaken in 1998, on the grounds that it had not been consulted or involved in the work. While the latter is true, GOB's attitude meant that this high quality analytical work was entirely wasted.</p>	Agreed
	<i>Petrobangla's shortcomings</i>	

63.	<p>Even though some of the inordinate delays in project implementation were due to factors beyond Petrobangla's control, it is apparent that Petrobangla did not act expeditiously as regards the training program and reservoir management study. Furthermore, Petrobangla subsequently failed to make alternative arrangements to fund the training program and the reservoir management study during the three years since the IDA Credit was canceled. It would appear that the top management of Petrobangla either was unconvinced of the importance of these activities or was not willing to arrange alternative funds, either from internal or GOB sources to cover the shortfall.</p>	<p>Agreed but the last sentence may be rewritten as follows: "The top management of Petrobangla was convinced of the importance of these activities but could not proceed with alternate support with the anticipation of receiving extension of IDA fund".</p>
64.	<p>For these reasons, overall Borrower performance is assessed as highly unsatisfactory.</p>	<p>Agreed</p>
65.	<p>Conclusions Could the Bank's departure from the gas sector have been avoided, or the damage contained earlier? The situation in the gas sector was not unique. On the Bank side, the perception that the gas sector was unresponsive to change and resistant to reform was in keeping with a more general view held by the Region's top management that Bangladesh was a 'poor performer'. Total IDA assistance to the country had declined and the CAS 'low case' scenario was the basis for the lending program. This merely reinforced the energy team's conviction that it had to be "firm" in sticking to its reform agenda, and that GOB had to demonstrate results <i>before</i> IDA funds could flow.</p>	<p>Agreed</p>
66.	<p>The Bank management's decision not to extend the closing date even once is striking, but is in keeping with this frame of mind. It illustrates the extent to which relations in the sector between GOB and the Bank had deteriorated. The Bank had clearly lost all patience and one has to assume that the decision not to extend the Credit was clearly thought through and was intended to send a strong signal to GOB of the Bank's dissatisfaction and unwillingness to continue to assist a sector in which it had been present for over two decades. It thus seemed to signify an end to any Bank involvement in the sector for a prolonged period. If the purpose of the cancellation was to trigger a response in the form of an internal GOB/Petrobangla re-evaluation of sector management, it failed to lead to any noticeable alterations or improvements in sector performance.</p>	<p>Agreed</p>
67.	<p>An alternative approach would have been to just extend GIDP to cover the training component and reservoir management studies, both of which would have had a very positive institutional development impact. This had been recommended by the supervision mission just prior to the decision to maintain the original closing date. With hindsight, it might have been preferable to have provided a selective extension to the closing date, because that would also have kept open the door to a more active involvement in future, should circumstances change. Now that IDA is keen to increase lending for infrastructure projects and is once again receptive to the idea of financing projects in the gas sector, it has to recognize that an early re-engagement, in the absence of progress in policy matters since its pullout, would be seen as damaging to its credibility and limit its effectiveness in seeking reforms.</p>	<p>Agreed</p>
68.	<p>Lessons The main lessons that emerge from the assessment of these two projects are:</p> <ul style="list-style-type: none"> • In designing institutional development components of projects, the 	<p>Agreed</p>

	<p>incentives for those directly concerned by proposed changes should be well aligned with the project objectives. In particular, the staffing and remuneration implications of major institutional reorganizations (such as the creation of GTCL), need to be well understood and explicitly addressed if reorganizations are to be successfully implemented;</p> <ul style="list-style-type: none">• Building a strong gas industry of international standard requires a major ID effort: better management, greatly increased training, better remuneration and more autonomy;• The Bank should take a less dogmatic approach to sector reforms and practice greater sensitivity to local socio-political constraints, if it is to achieve collaborative dialog and succeed in obtaining Borrower 'buy-in' to its proposals.• Strong and continuing field office involvement in substantive project work is more effective than intermittent, long-distance involvement of HQ staff.• When the Bank finds it difficult to justify its support for a particular sector due to policy differences, it should strategically weigh the benefits of maintaining a flexible form of engagement against the consequences of full withdrawal. Repeated sharp changes in the Bank's involvement could be damaging to its credibility and could constrain its ability to seek policy reforms.	
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