



1. Project Data

Project ID P128012	Project Name BD Ghorashal Unit 4 Repowering Project	
Country Bangladesh	Practice Area(Lead) Energy & Extractives	
L/C/TF Number(s) IDA-57580	Closing Date (Original) 31-Mar-2022	Total Project Cost (USD) 181,741,472.08
Bank Approval Date 21-Dec-2015	Closing Date (Actual) 30-Sep-2023	
	IBRD/IDA (USD)	Grants (USD)
Original Commitment	217,000,000.00	0.00
Revised Commitment	185,264,026.34	0.00
Actual	181,741,472.08	0.00

Prepared by Fernando Manibog	Reviewed by Christopher David Nelson	ICR Review Coordinator Ramachandra Jammi	Group IEGSD (Unit 4)
--	---	--	--------------------------------

2. Project Objectives and Components

a. Objectives

The Project Development Objective (PDO) was “to increase generation capacity and efficiency of the targeted power plant.” (Financing Agreement dated April 7, 2016, Schedule 1)

The PDO statement is the same in the Project Appraisal Document (PAD) and the Implementation Completion and Results Report (ICR).



For the purposes of this IEG ICR Review, the PDO will be assessed as follows:

Objective 1: to increase the generation capacity of the targeted power plant

Objective 2: to increase the efficiency of the targeted power plant.

The PDO, the theory of change, and the PDO-level outcome indicators were not modified during project implementation. Consequently, a split rating is not required.

b. Were the project objectives/key associated outcome targets revised during implementation?

No

c. Will a split evaluation be undertaken?

No

d. Components

Component 1: Repowering of the Target Unit

(Total estimated cost at appraisal of US\$255 million, of which IDA US\$210 million; the actual cost is US\$219.95 million per the ICR, Annex 3)

This component financed all the required plant equipment and auxiliaries, design, and installations services for the full repowering of Unit 4 including a 239MW GE gas turbine to allow conversion of the existing steam unit to a combined cycle unit. The component did not cover the works on the existing steam turbine as major overhauling works were carried out, including repair and replacement of key turbine parts/blades, during the preparation of the project in 2015.

Component 2: Technical Assistance for Institutional Strengthening Support

(Total estimated cost at appraisal of US\$8 million, of which IDA US\$7 million; the actual cost is US\$3.95 million per the ICR, Annex 3)

This component financed an Owner's Engineer (implementation support consultant) to ensure effective management, monitoring and quality assurance of the design, engineering and construction and the initial operation of the repowered plant. This component also focused on capacity building and automation of BPDB's financial reporting system. The TA also was used to hire individual consultants to support PMU and GPS in areas of environmental and financial management and other areas as needed.

Although not in the PAD, the ICR mentions a Component 3: Spare Parts, amounting to US\$29.10 million. With the actual contract offer much lower the original estimate, i.e., US\$177 million versus US\$210 million), a Component 3 was added to cover the initial spare parts from IDA savings under the long-term service agreement (LTSA) for gas turbine maintenance. It was decided at the mid-term review to reallocate about US\$24.9 million from those savings from Category 1 to a new Category 3 to enable this procurement.



e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project Cost. The original total project cost was US\$263 million. This amount was revised to US\$185.3 million when IDA funds were cancelled in March and then in September 2023, at closing. The actual amount disbursed was US\$181.7 million.

Financing. IDA financed the total actual project cost.

Borrower Contribution. At appraisal, the Borrower committed to contribute US\$46 million. The Borrower's actual contribution was about US\$14 million through payments of taxes and duties and VAT.

Dates. The project was approved on December 21, 2015 and declared effective on May 15, 2016. A midterm review was conducted on April 7, 2019. The original closing date was March 31, 2022. With an extension of 18 months, the actual closing date was September 30, 2023.

Restructuring Events. The project was restructured five times, as follows:

November 2021: The first restructuring extended the closing date by nine months due to a delay in commissioning the combined cycle plant to allow for additional work to fix the shaft vibration in the steam turbine, and delays resulting from the COVID 19 pandemic. A new component was added for the procurement of initial spare parts under the long-term service agreement (LTSA), for which IDA Credit savings were reallocated. The technical assistance for automating BPDB's financial reporting was removed to avoid duplication with another government-funded project.

October 2022: The second restructuring reallocated US\$4 million to accommodate the conversion rate fluctuations between SDR and USD.

December 2022: The third further extended the closing date by nine months due to the delay in completing the additional works to fix the shaft vibration in the steam turbine, which was needed prior to commissioning of the combined cycle plant.

March and September 2023: The 4th and 5th restructuring the cancellation of IDA proceeds. US\$10 million from the savings was first cancelled; then US\$21.92 million was also cancelled that was expected to be paid to the contractor after achieving the guaranteed output in combined cycle, at closing. When the Bank exited from the project, BPDB agreed to pay this amount from their own resources after the contractor has achieved the combined cycle guaranteed output.

3. Relevance of Objectives

Rationale

Country and Sector Context. At appraisal, the Bangladesh economy had been performing well, with a GDP growth rate that rose from an annual average of 3.7 percent in the 1980s to over 6% since 2010, thus moving the country to lower-middle income status in 2015. This growth depended on reliable and affordable electricity supply. The government, however, was behind on its generation capacity expansion plans, resulting in a major gap of about 3,000 megawatts (MW) between supply and demand, leading to significant



load shedding. Over the medium term, the project annual growth rate in electricity demand growth is ten percent, i.e., demand will double every seven years.

The project's strong rationale during the preparation phase remains valid at present. During preparation, the relevant sector master plan was the Power Sector Master Plan (PSMP) 2010, which recommended higher efficiencies in thermal generation and gas utilization through the re-powering of existing power stations, given the prospect of curtailment of natural gas production. For this specific project, repowering of the Ghorasal unit would result in reduced per-MW cost by reusing existing auxiliaries, equipment, and site, thus avoiding the time and cost for new land development works, resettlement, and related social issues. With some modification, the existing gas supply and power evacuation system can also be used. Unlike the current power surpluses, the project was also intended to address severe power shortages at that time. The project's longer-term objective was to reduce overall generation costs by commissioning large power plants—including the conversion of steam plants to combined cycle—thus enabling the retirement of costly liquid fuel plants and the reduction of burdensome government subsidies.

By the 2015 appraisal, with only 310 MW capacity added to the grid due to delays in reaching financial closures, the Government of Bangladesh (GOB) contracted about 2,400 MW of rental plants (with terms of 3 to 5 years) running on expensive liquid fuel. Due to delays in adding base load generation, GOB had to renew most of these expensive rental contracts for another term. About 62 percent of power generation was based on natural gas and 30% on imported diesel and heavy fuel oil (the balance come from hydro, coal, and power imports from India). However, while rich in natural gas resources, gas supply was in deficit of around 600 mmcfd due to limited exploration investments and inadequate gas transmission systems.

At appraisal, about 42 percent of the total installed generation capacity was owned by the Bangladesh Power Development Board (BPDB), while Private Power Producers (rentals and independent power producers) accounted for 43 percent of installed capacity, 4% of the capacity was being imported and the rest was held by state-owned corporations. BPDB's generation infrastructure, however, had not been modernized and had a low average efficiency of around 30 percent, or a mere half that of modern gas-based combined cycle power plant efficiencies of 60%. Consequently, with gas supplies diminishing, the repowering of existing power stations to achieve higher efficiency was included in the 2010 Power Sector Master Plan (PSMP).

At present, GOB still relies on private generation at a time when there is an electricity oversupply, i.e., a supply of 26 gigawatts (GW) compared to the maximum demand of about 15 GW. This is the result of having awarded, around the time of the 2015 appraisal, many private sector-led liquid fuel-based capacity with 3- to 5-year terms. GOB is obliged to make capacity payments to these private generators, thus obliging BPDB to prioritize running these power plants, despite higher costs. Since this has constrained the utilization of public-sector plants, GOB has assumed the financial burden of allocating major subsidies to the power sector.

Relevance to Bank and Country Strategies. At the September 2023 project closing, the relevance of the PDOs to the World Bank Group's Bangladesh Country Partnership Framework (CPF) for FY 2023-FY 2027 remained high. In view of poverty reduction goals, the CPF confirmed the energy sector as the country's main economic driver and a priority investment area of investment. The PDOs have become even more highly relevant to the objectives of improving the efficiency in fuel consumption and thereby reducing carbon dioxide (CO₂) emissions. Thus, the PDOs remain well aligned with the Government's Power Sector Master Plan, which aims to introduce highly efficient power supply and technologies with low CO₂ emissions to move toward a low-carbon society. Through plant modernization, the PDOs are also



consistent with (i) the Bank's strategic focus on mitigating climate change impacts and (ii) the ongoing focus on energy efficiency as part of the Global Challenge Program.

Summary Assessment of the Relevance of Objectives. While the project's PDOs and level of ambition are appropriately pitched to the country's level of development, the issue of project timing needs further clarification (e.g., in the context of the Project Performance Assessment Report recommended in Section 13) since the issues of excess generation capacity, oversupply of electricity, and merit order dispatch were already looming around the 2015 appraisal, given the number of the quick-rental private suppliers and the renewal of their contracts. The relevance to the Bangladesh economy of balancing electricity supply and demand is high; however, given the need for further assessment to clarify and learn from this timing issue, the relevance of this particular project's PDOs is rated substantial.

On the issue of project timing, the Bank team clarified on June 21, 2024, that the demand-supply gap was about 3,000 MW in 2014-2015 when the project was prepared, whereas there is currently an electricity oversupply situation resulting from having awarded many private sector-led, liquid fuel-based capacity to the grid. Thus, despite the government's commitment to prioritize the project's gas supply, the project did suffer from this new rental capacity or renewal of existing contracts. The government's commitment to make capacity payments to these private generators obligates it at times to keep this power capacity running at high cost, while ignoring higher efficiency public sector plants. There were also vested interest groups with incentives to keep the rental plants running. This resulted in the government's lack of emphasis in restarting the project's gas turbine (240 MW) in January 2021. At the Bank's insistence, the gas turbine was put back in operation and is generating electricity at a higher efficiency than the steam turbine.

Rating

Substantial

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

To increase the generation capacity of the targeted power plant

Rationale

Theory of Change (TOC). As a standard supply expansion operation in the well-established electricity industry, the TOC for Objective 1 is straightforward. The physical inputs to repower Unit 4 of the Ghorasal power plant, from 210 MW to 409 MW, in combination with the overhauling of the existing steam turbine, can be assured per engineering design to result in outputs that include a gas turbine and a heat recovery steam generator. Upon commissioning and operation at targeted capacity (which did not materialize due to under-utilization), the PDO-level outcomes (which consequently were not achieved) of increased generation capacity, higher efficiency in combined cycle mode, and greater lifetime fuel savings can be guaranteed to materialize per technical design. These short-term outcomes, which are within the project's scope of



implementation, are expected to contribute to the longer-term outcomes of improved BPDB operational capacity and greater sustainability of the generation system.

The critical assumptions were well identified. Sustained economic growth and high electricity demand materialized. However, the assumptions related to client and consultant capacity and ownership did not materialize: the performance of the Owner's Engineer was unsatisfactory, and the government's ownership of the project was weak or absent. One critical assumption that was not addressed had to do with the political economy and governance issues surrounding merit order dispatch.

The PDO-level outcome indicator is:

- Generation capacity constructed under the project measured by MW.

Outputs/Intermediate Results

- Compared to the original target date of June 30, 2018, the gas turbine was commissioned with four months of delay on October 30, 2018, due to the delay (by the Power Grid Company, not BPDB) in the arrangements for temporary evacuation. However, the GT unit was not in operation for one year between January to December 2021 because BPDB did not take over the operation of the unit on time from EPC contractor.
- The overhauling of the steam turbine, which was targeted for completion in September 2023, was not completed.

Outcomes

- Only 240 MW of additional generation capacity was achieved at closing, compared to the baseline of 170 MW in June 2015 and the target of 409 MW by March 2021.
- The Bank team notes in its June 21, 2024 comments that "the GT continued to be in operation as per NLDC (National Load Dispatch Center) requirement. Until March 2024 when the ICR was being completed, more than 2,700 GWh was generated by the GT since its commissioning. BPDB has earned more than US\$150 million as revenues (considering average selling rate to distribution companies and average exchange rate) when EPC contract was around US\$177 million."

By the ICR's own account (page 10), "the project fell short of the PDO level indicator to achieve 409 MW in combined cycle at project completion." Unit 4's generation capacity was increased from 170 MW to 240 MW, without the steam turbine (ST) in operation, when the Bank decided not to extend the closing date beyond the 18 months of extension already granted. The Bank's decision to exit the project is "due to GOB's lack of ownership and urgency, which caused significant delay in initiating the additional works to achieve the baseline capacity of the ST."

As a background, the agreed works under Bank funding to get the plant ready for combined cycle operation were completed two years prior to the project closing date. However, the successful commissioning was halted by vibration in the ST shaft, hence limiting the baseline capacity. The gas turbine remained idle for a long period of 11 months.

Although additional works were agreed, the awarding of the variation order for the additional works was delayed significantly and was not completed by project closing. More delays occurred when, upon



commissioning of the GT in Oct 2018, the ST had to be taken out of operation due to the need to change the gas connection from ST to GT. Also, for CC operation, additional equipment needed to be installed and the existing boiler dismantled. During the CC commissioning trials in January 2021, when there were still technical issues related to shaft vibration, a maximum generation capacity of 384 MW in combined cycle was achieved.

The Bank team suggested to BPDB to operate the plant in CC mode at lower capacity, backed by the Bank ST expert's advice. However, BPDB refused, citing the issue of the shaft vibration. Despite the Bank ST expert's assessment that during high shaft vibration, the bearing vibrations were all normal and the ST condition was not of concern. BPDB insisted on its own differing technical assessment, when there were also broader issues suggesting that the timely and full capacity operation of the plant may not have been a priority for BPDB. At that time, Bangladesh had an oversupply of electricity and government's obligations to private generators appeared to have been prioritized.

The performance of the Owner's Engineer (OE), who was supposed to supervise the works of the EPC contractor, was unsatisfactory. This was most evident during the shaft vibration discussions. The OE did not provide BPDB with a technical assessment of the issues, appeared reluctant to provide any official report to BPDB management, and was not involved during the negotiations of the additional works with the EPC contractor. In light of the OE's lack of active engagement, the Bank team had to hire an independent steam turbine expert. However, when the expert's report was submitted to the Power Division, no action was taken based on the report's findings.

Summary Assessment of Efficacy for Objective 1. BPDB took over the funding of the ST additional works. The ICR indicates that the full targeted capacity of the plant operating in combined cycle could be expected by December 2024. This is in doubt, however, given the history of long delays resulting from the lack of government ownership. With the PDO-level indicator being delayed and far from achieved at project closing, i.e., 240 MW actual versus the 409 MW target, the project's efficacy in achieving Objective 1 is rated modest.

Rating
Modest

OBJECTIVE 2

Objective

To increase the efficiency of the targeted power plant

Rationale

Theory of Change. As mentioned above, if operated at the targeted capacity, the efficiency and fuel savings targets can be expected to materialize per engineering design. The inputs including a project engineer, institutional support to BPDB can be expected to result in effective implementation support and efficient plant operation. However, as discussed above, the Owner's Engineer performed unsatisfactorily and BPDB and the Power Division resisted the Bank's technical advice, thus preventing the causal links of the TOC to operate. The same critical assumptions and identified shortcomings as discussed above apply here in Objective 2.

The PDO-level outcome indicators are:



- Projected lifetime fuel saving measured by Petajoules (PJ)
- Overall efficiency of the target unit measured in percentage (%)

Outputs/Intermediate Results

- Compared to the targeted 303 petajoules (303,000,000,000 megajoules) of projected lifetime fuel savings by March 2021, only 62.6 petajoules (62,600,000,000 megajoules) was achieved with a delay of two and a half years in September 2023.

Outcomes

- The efficiency of the targeted unit, as measured by gas consumption per GWh output, was targeted to increase from the baseline of 30 percent in June 2021 to 53 percent by March 2021. However, at project closing, only 34 percent was achieved.

The plant's efficiency had increased from 30% to 34% at project completion by adding the new GT in October 2018. This falls significantly short of the 54% target since the plant was not operated in CC mode. The same issues that impeded the achievement of Objective 1 apply in explaining the failure to achieve Objective 2.

Summary Assessment of Efficacy for Objective 2. Given the significant delays, the lack of government ownership, the low achievement of lifetime savings (about 20 percent of targets), and the failure to achieve the plant efficiency target (34 percent versus the targeted 54 percent), the project's efficacy in achieving Objective 2 is rated modest.

Rating
Modest

OVERALL EFFICACY

Rationale

The achievement of both Objectives 1 and 2 are modest, as explained in more detail in the summary assessments above. None of the PDO-level indicators were achieved. The actual levels of achievement are significantly below targets, while experiencing major delays. The only achievements were that the Strategic Business Unit and the Environmental & Social Management Unit at Ghorasal plant became functional. Overall, the lack of government ownership, gas supply constraints for feeding the GT, and the political economy surrounding priority dispatch of electricity of private producers during electricity oversupply situations, seriously undermine the prospects for achieving project objectives.

Overall Efficacy Rating
Modest

Primary Reason
Low achievement



5. Efficiency

Economic Analysis. The ICR compared the ex ante and ex post economic efficiency of the project based on comparative Net Present Values (NPVs) for different operational scenarios for the plant, alternative fuels, and market demand. According to the ICR (page 13), the project’s actual performance produces “negative NPVs ranging from US\$135 to US\$190 million, due to poor utilization, reduced efficiency and lowered capacity.” The ICR hypothesizes that: “With improvements in utilization and achievement of CCGT operations starting 2025, the project will be able to deliver on an expected ERR of 26 to 34 percent under the project-as-designed (PDE) scenario at appraisal. The reality at closing, however, is that the plant is achieving 67 percent utilization compared to the PDE of 87 percent; moreover, it is operating at 34 percent efficiency compared to the PDE of 54 percent. This calls into question the ambitious forecasts outlined in the analysis.

Administrative and Implementation Delays. The PDE expected construction works to span 36 months. However, given the significant delays due to the changing scope of work resulting from technical challenges and COVID-19 pandemic restrictions, the commercial operation date of the 409 MW CCGT has yet to be achieved. Thus, in strict terms, the construction stage of the project has not yet been completed.

Summary Assessment of Efficiency. Given the negative NPVs generated by the project, and the implementation delays, the project’s efficiency is rated modest.

Efficiency Rating

Modest

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal		0	0 <input type="checkbox"/> Not Applicable
ICR Estimate		0	0 <input type="checkbox"/> Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

The relevance of objectives is substantial. The project’s efficacy in achieving the objectives is modest and its efficiency is also modest. Thus, the project’s overall outcome is moderately unsatisfactory.

a. Outcome Rating

Moderately Unsatisfactory



7. Risk to Development Outcome

Gas shortage. The shortage of gas supply is likely to affect the operation of gas plants in Bangladesh, including Ghorashal unit 4. This has resulted on the client's inability to utilize the power plants at optimal levels. GOB is reported to be working on a plan to increase supplies, which, if successful, will improve the situation at Ghorashal. This risk needs close monitoring and follow-up to ensure GOB's prioritization of gas supply to the Ghorashal power plant and its commitment to achieve the project outcome.

Capacity Oversupply. The oversupply of power capacity is a risk that may hinder full utilization of the power plants, including unit 4. As of project closing, the Ghorashal power complex had a total generation capacity of about 800 MW. However, it generates only about 400MW, or 50% of available capacity. This capacity is expected to increase to 1,200 MW once the repowering of unit 4 and other units are completed. As a mitigating action, BPDB is proposing the signing of new Power Purchase Agreements (PPA) once units 3 and 4 become operational in combined cycle mode. This signed PPA would commit the government to buy adequate amounts of electricity from the Ghorasal power system and limit the idling of the units. Nonetheless, overcapacity needs to be monitored closely as a potential mid-term risk, as well as the pace at which oversupply will diminish as power demand grows in the long run.

8. Assessment of Bank Performance

a. Quality-at-Entry

The PDOs were and continue to be well aligned with the strategic priorities of the Bank and the Government. The project's theory of change and design were straightforward as a supply capacity expansion and efficiency improvement operation. The Results Framework adequately served the needs of the M&E system. The appraisal process adequately covered the technical, financial, and economic aspects of the project. However, the political economy, market pressures, and governance aspects needed more analysis and foresight. Ultimately, these factors were central to the effectiveness of what was a considerable infrastructure investment.

Environmental and social aspects were sufficiently addressed at entry through the preparation of the Environmental and Social Management Framework (ESMF) and site-specific Environmental and Social Impact Assessments (ESIAs).

For implementation arrangements, plans were made to adequately staff the Project Management Unit (PMU) in GPS. Technical assistance was also planned to support capacity improvements. Apart from the political and governance risks mentioned above, the risk assessments and mitigation measures were adequate.

Given the fiduciary risks in the country, and more generally to mitigate procurement risks, an Independent Procurement Panel (IPP) was agreed between the Bank and GOB during project preparation and subsequently appointed. The IPP was intended to protect the procurement process from external



influence on procurement decisions, and independently conduct procurement of high-value packages. Thus, the four-member IPP conducted the technical evaluation of the EPC bids. The IPP excluded BPDB staff and was comprised of experts with international experience. According to the ICR, there were no complaints received during or after the evaluation; moreover, the cost of the repowering works for unit 4 came to about US\$90 million less than the other repowering contract (unit 3) awarded by the BPDB two years earlier (i.e., respectively US\$177 million versus US\$261 million). Thus, quality at entry is rated satisfactory.

Quality-at-Entry Rating Satisfactory

b. Quality of supervision

The ICR (page 19) indicates that the Bank team provided regular implementation support for the project, comprising 12 missions. There were two Task Team Leaders (TTLs) during the project period, with the primary TTL based in the country throughout implementation to ensure close supervision. The team's engagement with the implementing agencies was proactive and intensive, especially during the stage of making the gas turbine operational. The team also addressed several delays in submission of audit reports, PMU staffing of PMU, and signing of the Long Term Service Agreement.

COVID-19 had a challenging impact on field supervision that was most especially evident during the combined cycle commissioning trials. With special permission from the Country Director, however, the Bank team was still able to meet with the counterparts despite restrictions on external meetings. The operationalization of the steam turbine, which was unresolved at closing, was outside the Bank team's control.

The Bank team sought to find solutions to the various challenges to the project. They actively pursued BPDB to resolve implementation issues, leading to successful and timely completion of the main EPC contract. Most significantly, the Bank team persistently elevated to higher management (Power Division, Finance Division and BPDB) the financial implications of keeping the GT idle, hence the urgent need to resolve the challenges related to awarding the contract for the overhauling and operationalization of the steam turbine. The ICR credits the Bank team's persistence for helping make the GT operational from December 2021 and cites the team's candid and continuous updates to the Bank's management regarding the project's implementation challenges.

Quality of Supervision Rating Satisfactory

Overall Bank Performance Rating Satisfactory

9. M&E Design, Implementation, & Utilization



a. M&E Design

The project's theory of change (TOC), which was the basis of the M&E system design, was sound and logical in terms of its causal links and the attributability of outcomes to project interventions. The Results Framework was consistent with the TOC and well-aligned with the strategic priorities of the Bank and the Government. The selected PDO indicators were adequate measures of the generation capacity expansion and efficiency improvement PDOs. These outcome-level indicators and the intermediate results indicators (IRIs) were relevant, measurable, and time-based. Specific baselines and targets were established. The TOC, however, did not operate since important critical assumptions did not materialize, as discussed in the Efficacy section.

b. M&E Implementation

The PMU in BPDB was responsible for collecting and processing relevant data and providing them to the Bank team. The data collection system and reporting arrangements were generally adequate. Monitoring, data processing, and evaluation have been generally regular. Overall, the quality and timeliness of required M&E reporting were satisfactory.

c. M&E Utilization

The M&E system was used to report on Project progress, including both positive and negative aspects, were reported through the M&E system. To obtain first-hand data on implementation progress, the Bank task team made regular field trips that included meeting with the contractor's engineer and GPS management team to assess ongoing and emerging issues. This enabled timely remedial actions to be carried out. The findings and operational results were communicated to the GOB and Project agencies through the Bank supervision mission's working documents and technical notes that feed into the periodic reporting of the Implementation Status Reports (ISRs). As discussed earlier, however, BPDB and the Power Division resisted or ignored the Bank's advice, through its technical expert, regarding the operation of the steam turbine.

M&E Quality Rating

Substantial

10. Other Issues

a. Safeguards

The project was classified as a "Category A" given the complexity of environmental issues associated the project's major civil works and decommissioning of existing boilers. Apart from the umbrella policy of OP/BP 4.01: Environmental Assessment, no other safeguard policies were triggered since all of the project activities would occur within the borders of the industrial complex. According to the ICR (p. 17), safeguards implementation was satisfactory. All of the required assessment were done. BPDB and EPC contractors



also prepared and implemented safeguards management plans. There were no pending environmental and social issues at project closing.

BPDB with the support of EPC contractors also prepared a COVID management plan consistent with World Bank and WHO guidelines. The EPC contractors arranged and satisfactorily implemented an occupational health and safety training for the workers in October 2020, as well as a Labor Influx Plan.

A grievance redress committee was also established at the project level. The PMU did not receive any grievances from the local people related to labor influx or community health and safety issues.

b. Fiduciary Compliance

Financial Management (FM). For almost two years, BPDB was non-compliant on one legal covenant and did not meet the pre-agreed deadline for the internal audit of the project. In FY19, external auditors expressed an unqualified audit opinion on the project’s financial statements; however, BPDB still needed to conduct a risk-based internal audit of the project as required by the Financing Agreement. This issue was resolved in 2021 after repeated recommendation during Bank supervision missions, albeit with delay in the selection of the auditor. Other than this issue, audit reports, financial reports, and other financial information were submitted on time. The audit opinion for FY21 was unqualified. However, there was a material audit observation in the management letter of the audit report, which were subsequently resolved by BPDB.

Procurement. An Independent Procurement Panel was used to satisfactorily undertake the procurement process for the EPC contract, resulting into significant cost savings. Regarding the rectification of the ST vibration problem, however, there were significant delays in the procurement of the additional works by the EPC contractor. This had the negative impact of delaying the operation of unit 4 in combined cycle mode, and not achieving the associated PDO indicator. There were also major delays in procuring the LTSA for spare parts, on a direct contract with the OEM. BPDB eventually awarded the LTSA contract and implementation was able to resume.

c. Unintended impacts (Positive or Negative)

None identified, given the supply focus of the project that was implemented within the restricted boundaries of a power generation complex.

d. Other

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
---------	-----	-----	----------------------------------



Outcome	Moderately Satisfactory	Moderately Unsatisfactory	None of the PDO indicators were achieved at closing. The likelihood of achievement is not assured, given political economy and market factors, governance risks, and most especially the lack of Government ownership, all of which negatively and persistently burdened and delayed project implementation.
Bank Performance	Satisfactory	Satisfactory	
Quality of M&E	High	Substantial	The reported M &E performance is expected and standard, with no distinguishing achievements or special attributes.
Quality of ICR	---	Substantial	

12. Lessons

The ICR presented several lessons, of which the two below (with paraphrasing by IEG) had the most prospects for broader application and replicability.

Focusing on the political economy and market analysis is essential during project design and preparation. Although the replacement of high-cost liquid fuel was a major benefit of the project, it was only partially achieved due to major political economy factors. First, whereas there was an undersupply 3,000MW of electricity during the preparation stage, there was an oversupply of 10,000MW at project closing. Second, there were issues with the gas supply shortage. Third, the use of private sector generators involved costly capacity payments and are very likely to be non-compliant with the merit order dispatch policy due to other vested interests. While there is already a merit order dispatch policy in place, it appears that it is not strictly followed due to inefficiencies in its implementation system, which detracted from implementation success and the achievement of project outcomes. These highlight the need for greater focus on the political economy and market analysis as early as the project design stage. Much earlier and greater emphasis on analyzing market movements would also help to encourage studies on upstream gas supply and to identify measures to mitigate potential risks to downstream demand. Finally, new reforms and concrete measures are needed to link economic dispatch to SCADA so that inefficiencies in the dispatch process are removed.

In low-capacity environments, the use of an Independent Procurement Panel (IPP) could be considered but needs to be matched with the country client’s full ownership. While the project’s use of an IPP was a generally successful story, it contributed to the client’s lack of ownership. Where applicable and needed, the use of independent experts could be considered to provide technical and procurement advice to the client during the procurement process.



13. Assessment Recommended?

Yes

Please Explain

A case study needs to be undertaken to analyze the implementation experience of this project to identify ways to mitigate the potential risk of corruption and minimize reputational risk to the Bank. The study could also yield valuable insights on the power dynamics that may influence factors outside the direct control of the project, including weak institutional governance, lack of accountability, and vested interests that may have deliberately slowed down the implementation, left capacity underutilized, and diminished the prospect and visibility of project achievements.

14. Comments on Quality of ICR

The ICR is written clearly, logically presented, and sufficiently candid about the numerous and complex technical as well as political challenges encountered by the project. It developed an adequate theory of change (TOC), to which it adhered closely to trace the project's causal links from inputs/outputs to intermediate and final outcomes, thus transparently and objectively presenting how and why the PDO-level indicators were not achieved. The ICR placed much emphasis on providing quantitative evidence, thus making its findings robust and strengthening its assertions related to project performance. As a whole, it complies with the OPCS guidelines for preparing ICRs. One shortcoming, however, is the lack of comparison in the Efficiency section between the actual economic performance indices at closing and the PAD's forecast economic analysis at appraisal. There were also gaps, like the incomplete annex on original and actual project costs. Overall, the ICR Quality is rated substantial.

a. Quality of ICR Rating Substantial