

FINANCIAL ANALYSIS

A. Background

1. The South Asia Subregional Economic Cooperation (SASEC) Second Bangladesh–India Electrical Grid Interconnection Project will allow additional power flows of 500 megawatt (MW) between India and Bangladesh. There is an existing interconnection of 500 MW transmission capacity that is currently being used by Indian power traders to supply power to Bangladesh. Transmission connectivity in the South Asian region permits countries to operate their power sectors more efficiently, including management of power surpluses and deficits.

B. Methodology and Major Assumptions

2. The financial analysis of the proposed SASEC Second Bangladesh-India Electrical Grid Interconnection Project was carried out in accordance with the Asian Development Bank's (ADB) guidelines.¹ All financial costs and benefits are expressed in constant 2015 prices. Cost streams used for the financial internal rate of return (FIRR) determination, i.e. capital investment, and operation and maintenance (O&M) costs, reflect the costs of delivering the estimated benefits. The revenue accruing to the executing agency is based on transmission tariffs used to estimate the financial benefits.

3. Financial viability was examined by comparing the incremental costs and benefits of the with and without-project scenarios. Incremental costs include the investment costs and operating costs associated with the project. The investment costs include the civil works, electrical and mechanical work, land acquisition and development, and safeguard costs for the project in Bangladesh. Interest during construction and price contingencies were excluded. Operating costs have been estimated based on the operating costs for the first interconnection commissioned in 2013, which uses a similar configuration.

4. The transmission tariff of the Power Grid Company of Bangladesh (PGCB) has not been revised for several years and was set by the Bangladesh government prior to 2008, when the Bangladesh Energy Regulatory Commission (BERC) had not yet developed tariff regulations. PGCB filed a tariff petition in 2014 to the BERC based on the BERC draft tariff regulations that offer a cost plus rate of return methodology. The draft transmission tariff regulations are to be notified in 2015. Notification of the regulations would permit a periodic re-adjustment of transmission tariffs by BERC. Several scenarios have been considered for revenue computation (i) the current tariff of Tk0.2291/kilowatt-hour (kWh), (ii) the tariff proposed in the tariff petition filed by PGCB to BERC, and (iii) a recomputed tariff based on the draft tariff principles. Calculations are based on the project commissioned in 2018 and 25 years of operation

5. Energy flows were computed based on an annual utilization factor of 85%. Income tax was taken to be 27.5% (applicable for publicly traded companies). The straight line depreciation method and rates of depreciation for different asset types were considered. In accordance with draft tariff regulations, assumptions included a working capital requirement of two months of operating costs, a one month inventory of both materials and supplies and prepayments. The free cash flow stream was converted to real terms by adjusting for domestic inflation for financial analysis. The project is expected to achieve commercial operation on 1 January 2018.

¹ ADB. 2005. *Financial Management and Analysis of Projects*. Manila

C. Calculation of Weighted Average Cost of Capital

6. To compute the weighted average cost of capital (WACC), the financing sources were assumed to comprise equity and debt contributions from the government as well as the Asian Development Fund (ADF) and ordinary capital resources (OCR) loans from the Asian Development Bank (ADB). The cost of equity was assumed to be 14.4%, based on the government's 15-year bond rate of 11.4% and a sector related margin of 3%. The analysis assumes the government will on-lend ADB's loan to PGCB at an interest rate of 4%. The loan tenure is 20 years, including a 5-year grace period. In addition, the government has cleared a loan at an interest rate of 3% and equity for counterpart funds to PGCB. The real WACC is computed as 2.1%.

D. Calculation of Financial Internal Rate of Return

7. The FIRR for the transmission project calculated in the base case assumes timely notification (in 2015) of the draft transmission tariff regulations. Once this has occurred, the tariff for PGCB would be set based on the BERC approved tariff regulations, and could be revised periodically. PGCB has prepared and submitted a petition to BERC for a tariff increase to nearly Tk0.39/kWh in 2014 based on the BERC draft regulations. A tariff trajectory for PGCB has been developed based on a review of the tariff petition filed by PGCB in 2014, the proposed capital investment plan of PGCB to meet the generation capacity addition plans and an assessment of the draft tariff regulations of BERC. The FIRR of the project at 4.9% exceeds the WACC of 2.1%, making the project viable. However, if PGCB's tariff is not increased from its current level, the FIRR would be -1.5% compared to the WACC of 2.1% and the project would not be financially viable.

E. Risk Assessment and Sensitivity Analyses

8. **External risks.** The following are considered as key external risks to the project based on an assessment of the Public Financial Management System of Bangladesh.

- (i) **Budgeting.** The Public Expenditure and Financial Accountability (PEFA) report indicated a substantial risk with respect to national budgeting. Bangladesh follows a medium-term budget framework that allows for multi-year development projects to be integrated into the budget process through the annual development plan approved by the Planning Commission. For this project, counterpart funds have been identified in 2014 and approved in 2015 by the Planning Commission and the Executive Committee of the National Economic Council for a period from 2015 to 2018. The funds from the government will be provided as debt and equity to PGCB for this project.
- (ii) **External audits.** The PEFA report indicates this risk as substantial. This risk is mitigated because the Foreign Aided Project Audit Directorate has the responsibility for conducting audits of all foreign aid funded projects. Draft audit reports are sent to Parliament. There are instances of unresolved audit observations for PGCB to address.
- (iii) **Tariff setting.** PGCB's transmission tariff rates have not changed since 2004; although draft transmission tariff regulations were prepared in 2008 by the

electricity regulator, notification has been delayed due to procedural issues. PGCB has applied to the regulator to revise transmission tariffs to enable it to improve operating margins and generate cash flows to service debt and for investments. Tariff-related risk can be mitigated only after (a) BERC tariff regulations are notified in the Bangladesh gazette, and (b) BERC sets tariffs based on the notified regulations permitting PGCB to recover its operating costs and a return on capital. Based on discussions with BERC, the Power Division of the Ministry of Power, Energy and Mineral Resources and the Ministry of Finance in April 2015, the government has presented a plan to complete the process for notification of tariff regulations in 2015 and this is underway.

9. **Project-specific risks.** Financial risks for projects typically include the following: (i) an increase in the price of civil works and equipment, (ii) delays in project implementation, and (iii) lack of access to necessary counterpart funds. These risks for this particular project are lower given the project's priority. Project approvals for counterpart funding were received from the government with the approval of the project proposal in 2015. Contracting is also in an advanced stage, with the project site ready, and in PGCB's possession. PGCB's implementation capacity has been demonstrated through implementation of the previous interconnection project, and the government released funds in a timely manner. A reduction in the flow of power over the project infrastructure could detrimentally impact the FIRR. Bangladesh has already purchased 500 MW of power from India over the existing interconnection through long term and medium term contracts and the government has cleared 500 MW of power purchase over the project facilities in August 2015. Given the increasing power demand in Bangladesh and the difference in the price of electricity between the two countries, it is unlikely that the interconnection would not be used. Transition to a capacity based tariff structure would further insulate PGCB from risks outside its control and would be supported by the loan funded consultancy.

10. **Sensitivity analysis.** Analysis was carried out to examine the sensitivity of the FIRR and the financial net present value to adverse changes in key variables namely: (i) a 10% increase in project costs, (ii) a 10% increase in operation and maintenance costs, (iii) a 10% reduction in power flows over the line, (iv) a 6 month delay in project commissioning, and (v) a combination of the above. The project is sensitive to a delay in commissioning and increase in project costs. To reduce the risk of delays, the procurement process commenced in February 2015 under advance action approved by ADB. Further, the contract is expected to be awarded in 2015 with a 24 month execution period. Project costs would be benchmarked against the cost of the previous project.

Table 1: Sensitivity Analysis

Scenarios	Variation	FIRR (%)	Switching Values
1. Base Case		4.90	
2. Increase in Project Cost	10%	3.80	66.00
3. Increase in O&M Cost	10%	4.00	350.00
4. Reduction in power flows	10%	3.80	24.00
5. Delay in Commissioning	6 months	4.40	36.00
6. Combined (2,3,4,5)		2.80	

FIRR = financial internal rate of return, O&M = operation and maintenance.

Source: Asian Development Bank estimates.

F. Historical Financial Performance of Power Grid Company of Bangladesh

11. PGCB was incorporated in 1996 and is responsible for the transmission of electricity in Bangladesh. The highlights of the historical performance of PGCB from 2010 to 2014 are in **Table 2**. Revenue growth has been driven from Tk5.9 billion in fiscal year 2010 to over Tk8.6 billion in fiscal year 2014 while profit after tax has fallen from Tk1.6 billion to negative Tk0.03 billion over the same period. The debt-equity ratio was 2.4 in FY2014. The debt-service coverage ratio (DSCR) dropped from 1.63 in FY2010 to 1.08 in FY2014 impacted by tariffs that are not cost reflective and low utilization factor of the transmission investments of PGCB.

Table 2: Financial Performance of Power Grid Company of Bangladesh

	2010	2011	2012	2013	2014
Revenue (million BDT)	5,930.00	6,255.00	7,142.00	7,870.00	8,672.00
Profit after Tax (million BDT)	1,607.00	925.00	1,184.00	1,010.00	(29.00)
Return on Equity (%)	10.00	4.70	5.30	3.40	(0.10)
Current Ratio	3.74	2.09	1.58	1.55	0.81
DSCR	1.63	1.19	1.52	1.66	1.08
Debt Equity Ratio	2.70	2.40	2.60	2.30	2.40

() = negative, BDT = Bangladeshi Taka, DSCR = debt-service coverage ratio.

Source: Power Grid Company of Bangladesh accounts.

G. Financial Projections for Power Grid Company of Bangladesh

12. Sources for the financial projections of PGCB include historical financial data, existing loans along with repayment schedules and interest rates, available capital expenditure plans, and funding plans for new projects. Revenue has been calculated based on the application of the BERC tariff methodology resulting in a tariff of Tk0.35/kWh for 2016, with an increase after three years, followed by nominal subsequent increases. Select financials of the company are shown in **Table 3**. PGCB's profit margin, return on equity and other ratios are expected to improve upon adoption and notification of the draft transmission tariff regulations and improvement in the utilization of the transmission grid as more base-load projects including combined cycle gas plants, imported gas and coal projects come online.

Table 3: Projected Financial Performance of Power Grid Company of Bangladesh

	2015	2016	2020	2023	2025
Revenue	10,757.00	16,153.00	39,121.00	57,394.00	74,222.00
Profit Margin (%)	(18.10)	(1.30)	3.10	10.40	18.20
Current Ratio	0.70	0.70	0.80	0.90	1.10
DSCR	0.79	0.84	1.17	1.73	2.20
D/E Ratio	2.30	2.30	2.10	1.80	1.60

DSCR = debt-service coverage ratio, D/E = debt-to-equity ratio.

Source: Projected Financial Statements of Power Grid Company of Bangladesh.

13. The absence of a cost reflective tariff and the present tariff structure based on flow of energy impacts the company's financial position. The draft regulation allows for tariff to be revised in line with the changing cost structures and a reasonable return is permitted. If PGCB tariffs stay at their current levels, there would be growth in revenue because of increased transmission capacity and power flows. However, the company's operating margin and profit margin would decline and cash flows would not be adequate to finance PGCB capital expenditure plans. Additionally, if tariffs are not revised, the company's liquidity position would worsen and support for debt repayment and equity infusions would be required from the government.

14. To improve the financial health of PGCB and make it a commercially viable and self-sustaining entity, recovery of costs on prudential norms along with a reasonable return should be allowed as a part of the tariff. BERC is empowered to set tariffs independently, and the government has agreed to consider a restructuring plan for PGCB in case the transmission tariff independently determined by BERC is inadequate to cover PGCB's costs.