FINANCIAL ANALYSIS

I. INTRODUCTION AND METHODOLOGY

A. Introduction

1. The financial analysis of the proposed project was carried out in accordance with the Financial Management and Analysis of Projects of the Asian Development Bank (ADB).[1] The project includes (i) the construction of the Rupsha 800-megawatt (MW) gas-fired combined cycle power plant (CCPP) in Khulna, in the southwestern part of Bangladesh; (ii) the construction of a gas supply pipeline and related network infrastructure; (iii) the construction of a power transmission interconnection facility to transfer power from the Rupsha power plant to the national grid; and (iv) strengthening of the institutional capacity and overall business process of the project's executing agency, North-West Power Generation Company Limited (NWPGCL).

B. Methodology

2. The financial evaluation was carried out for three components: (i) the Rupsha 800 MW gas-fired CCPP, (ii) the gas supply pipeline and related network, and (iii) the power transmission line. A financial discounted cash flow analysis was conducted on an after-tax basis in real terms to determine the weighted average cost of capital (WACC), the financial internal rate of return (FIRR), and financial net present value (FNPV) to assess the financial viability of each component. A financial analysis ascertained whether the FIRR can meet the calculated WACC based on the cost of capital from different financing sources. A sensitivity analysis was then conducted to assess the tolerance of the FIRR and FNPV to adverse movements.

3. The analysis also examined the financial sustainability of NWPGCL as an executing agency, including whether it has adequate financial resources to implement and operationalize the project as well as repay the associated loans. This analysis included (i) a review of NWPGCL's historical financial performance, and (ii) a financial forecast to determine whether NWPGCL is capable of maintaining and operating the assets after project completion.

II. FINANCIAL COST–BENEFIT ANALYSIS

4. NWPGCL will carry out construction of all three physical components (the Rupsha power plant, gas supply pipeline, and power transmission line). Upon completion, the gas supply pipeline (component 2) will be transferred to Sundarban Gas Company Limited and the power transmission line (component 3) will be transferred to Power Grid Company of Bangladesh. The financial cost–benefit analysis assumed NWPGCL would execute component 1, Sundarban Gas Company Limited component 2, and Power Grid Company of Bangladesh component 3.[2]

5. **Assumptions.** The financial cost–benefit analysis was conducted for the Rupsha power plant (component 1) under the following assumptions:

(i) all costs and revenues are expressed in 2017 constant prices and converted using $1 = Tk81;
(ii) the analysis was conducted from 2018 to 2046, including 5 years of construction, and the power plant was assumed to operate for 25 years upon completion;

[1] ADB. 2005. *Financial Management and Analysis of Projects.* Manila.
[2] The financial cost–benefit analysis for components 2 and 3 are shown separately in the Supplementary Financial Analysis (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).

(iii) an annual plant capacity factor of 70%, a net efficiency rate of 55.61% and a power station own-use rate of 3% were assumed throughout the project's life;
(iv) partial capacity of 540 MW will be installed by the end of 2021 and full capacity of 800 MW will be installed by the end of 2022;
(v) residual value of assets was estimated at 5% of the total construction cost, to be realized at the end of the final year of operations, and depreciation is calculated on a straight-line basis based on Bangladesh accounting and tax regulations;[3] and
(vi) the corporate income tax rate of NWPGCL is presently 35% and assumed to remain unchanged over the project's life.

6. **Project cost.** The capital cost for component 1 was estimated at Tk74,182 million, excluding price contingency and financing charges during construction. The operation and maintenance (O&M) cost was estimated based on parameters applied to a comparable power plant in Bangladesh.[4] The project will establish Bangladesh's first-ever power plant to use imported liquefied natural gas; the price of gas will be determined by the gas supply purchase agreement. The purchase price of gas was assumed to be $7.0 per million British thermal units in 2017 prices, increasing by 2% annually in real terms.

7. **Project revenue.** Assuming a power station own-use rate of 3%, the actual electricity volume supplied to the grid was projected to be 4,758 gigawatt-hours per year, with full capacity of 800 MW. Electricity will be priced based on the power purchase agreement between NWPGCL and Bangladesh Power Development Board. The tariff computation methodology applied to the recent power purchase agreement (footnote 4) allows all costs, including those related to debt service, O&M, fuel, foreign exchange variations, and insurance and corporate income tax, to be passed through with an additional return on equity of 12.5%. Under the cost pass-through tariff methodology, the electricity tariff of the proposed power plant was assumed to average Tk6.4 per kilowatt-hour during project life.[5]

8. **Weighted average cost of capital.** The WACC for the Rupsha power plant is estimated at 1.8%, as illustrated in Table 1.

Table 1: Weighted Average Cost of Capital for the Rupsha Power Plant Component

		Development Partner Loans		Government of Bangladesh		Total
Item		**ADB**	**IDB**	**Loan**	**Equity**	
A.	Amount ($ million)	398.0	248.5	107.8	161.7	915.8
B.	Weighting (%)	43.6	27.2	11.7	17.5	100.0
C.	Nominal cost (%)	4.0[a]	4.0[a]	3.0[a]	12.5[b]	
D.	Tax rate (%)	35.0	35.0	35.0	-	
E.	Tax-adjusted nominal cost [C*(1-D)]	2.6	2.6	1.9	12.5	
F.	Inflation rate (%)[c]	1.5	1.5	6.0	6.0	
G.	Real cost [(1+E)/(1+F)-1)](%)	1.1	1.1	(3.8)	6.1	
H.	Minimum rate test (I = 0%)	1.1	1.1	0.0	6.1	
I.	Weighted component of WACC	0.5	0.3	0.0	1.1	1.8
WACC						**1.8%**

[3] The annual depreciation expense was estimated at 5% of the cost of civil works and 10% of the cost of equipment.
[4] Power purchase agreement between NWPGCL and Bangladesh Power Development Board signed in April 2017 for the Bheramara 410 MW CCPP.
[5] The tariff constitutes a capacity payment and energy payments. The capacity payment covers debt service, return on equity, fixed O&M cost, insurance, and other fixed costs. The energy payment covers the variable costs of O&M, including fuel.

( ) = negative, ADB = Asian Development Bank, IDB = Islamic Development Bank, WACC = weighted average cost of capital.

[a] The nominal cost of the development partner loans and the Government of Bangladesh loan is based on the onlending rate to North-West Power Generation Company Limited from the government. Government of Bangladesh, Ministry of Finance. 2011. *Lending and Re-lending Terms of Local and Foreign Currency Loans*. Dhaka.

[b] The nominal cost of the equity contribution from the Government of Bangladesh is calculated using the capital asset pricing model: Risk-free rate (8.05%) + equity beta (0.9) × market return over risk free rate (3.05%) + project risk premium (1%) = 12.3%. Equity beta was estimated based on actual equity betas for electric utilities in India after removing the impact of corporate leverage. The average market return in Bangladesh of 12% was derived from the historical return on the Dhaka Stock Exchange from 2007 to 2017.

[c] The domestic inflation rate is in line with escalation rates published by ADB's Economic Research and Regional Cooperation Department.

Source: Asian Development Bank estimates.

9. **Financial internal rate of return.** The FIRR results are summarized in the Supplementary Financial Analysis.[6] For component 1, the FIRR is 6.0% and the FNPV is Tk34,340 million, demonstrating its financial viability.

10. **Sensitivity and risk analysis.** A sensitivity analysis was carried out to examine the robustness of the FIRR to adverse changes in values of key variables; the results are summarized in Table 2. Interruptions in the gas supply to the power plant at the time of project completion may cause delays in commissioning. The sensitivity analysis shows the project endure 6 years of delay in commissioning.

11. Under the cost pass-through tariff methodology, price fluctuations in the international gas market and foreign exchange variations will have almost no impact on the financial viability of the project, as fuel costs and foreign exchange variations are structured as pass-through items.

Table 2: Sensitivity of Financial Internal Rate or Return to Adverse Changes in Key Input Parameters

	Input parameter	Variation	FIRR	Baseline Value	Switching Value
	Base case		**6.0%**		
1	Capital cost (increased)[a]	10%	5.0%	1	1.5
2	Net efficiency rate (decreased)	(10%)	6.0%	55.6%	11.3%
3	Delay in commissioning	1 year	4.7%	No delay	6 years
4	Allowed return on equity (decreased)	(10%)	5.8%	12%	0%

( ) = negative, FIRR = financial internal rate of return.

Note: The switching value is the value at which the financial net present value equals zero.

[a] Assumes that the cost overrun was not recovered through tariffs.

Source: Asian Development Bank estimates.

III. FINANCIAL ANALYSIS OF NWPGCL

12. **Financial performance.** NWPGCL was formed, incorporated, and registered in August 2007 under the framework of the Government Power Sector Reforms Policy and the provision of the Companies Act, 1994. NWPGCL is one of the fastest-growing power companies in Bangladesh, with current installed generation capacity of 722 MW and present development activities aims to increase NPWGCL's generation capacity by an additional 2,590 MW by 2022.[7] NWPGCL has completed five power generation projects and is currently handling seven power

[6] Supplementary Financial Analysis (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).

[7] NWPGCL currently owns and operates three power plants: Sirajganj 214 MW CCPP, Khulna 230 MW CCPP, and Bheramara 278 MW CCPP (commissioned in May 2017).

generation projects at various stages, including this project, and expects to implement eight more power generation projects in the future based on its development and expansion plan.[8] NWPGCL's historic financial performance was reviewed using audited financial statements from fiscal year (FY) 2012–2013 to FY2016–2017.

13. **Profitability.** NWPGCL's revenue grew rapidly as it added generation capacity from 150 MW in FY2012–2013 to 722 MW in 2016–2017.[9] NWPGCL has consistently turned a profit, although the gross profit margin declined from 20.3% in FY2013–2014 to 11.1% in FY2015–2016. The decline in profitability in FY2015–2016 was attributed to an increase in fuel costs because expensive high-speed diesel was used to operate NWPGCL' S Khulna 225 MW power plant. The electricity generation decreased by 8.7% and revenue decreased by 12.3% in FY2015–2016 compared to FY2014–2015 due to the temporary closure of two power plants for inspection.[10] However, in FY2016–2017, the profitability grew again due to increase in electricity generation.

Table 4: Financial Performance Indicators of NWPGCL

Particulars	FY2012–2013[a]	FY2013–2014	FY2014–2015	FY2015–2016	FY2016–2017
Commercial Indicators					
a. Electricity sales (GWh)	…	1,249	2,302	2,101	2,729
b. Average revenue per unit sold (Tk/kWh)	…	8.8	9.1	8.8	8.1
c. Average cost per unit sold (Tk/kWh)	…	6.0	7.1	6.5	7.0
Financial Indicators (Tk million)					
a. Revenues	761	10,941	21,017	18,420	22,162
b. Expenses	760	8,827	18,419	16,586	19,343
c. Operating profit	1	2,115	2,598	1,835	2,819
d. Interest expenses	7	396	796	754	718
e. Foreign exchange fluctuation loss	0	0	19	69	227
f. Net profit after tax	46	1,118	1,284	824	1,295
Financial Ratios					
a. Operating profit margin (%)	0.1	19.3	12.4	10.0	12.7
b. Debt service coverage ratio (times)	0.6	1.7	1.8	1.6	2.0
c. Debt to equity ratio (%)	190	131	141	223	297
d. Current ratio (times)	1.0	2.8	2.8	2.2	2.8
e. Self-financing ratio (%)	1.0	21.0	26.0	16.0	15.7

… = not available, FY = fiscal year, GWh = gigawatt-hour, kWh=kilowatt-hour.
[a] Started earning revenue in fiscal year (FY) 2012–2013 through operations of the Sirajganj 150-megawatt power plant in December 2012.
Source: NWPGCL 2016 and 2017 annual reports; and Asian Development Bank estimates.

14. **Debt service capability.** NWPGCL's capital expenditures have been growing rapidly as it expands generation capacity. NWPGCL quadrupled its assets from Tk27,502 million in FY2012–2013 to Tk105,793 million in FY2016–2017, and quadrupled its external borrowing from Tk16,509 million to Tk73,973 million during the same period. Although NWPGCL has been dependent on borrowing to fund its investment, equity contributions from the government helped NWPGCL maintain a debt ratio below 70% in FY2016–2017. The debt service coverage ratio remained above 1.6, indicating that operational cash flows were adequate to service debt

[8] Financial Management Assessment (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).
[9] The Sirajganj 150 MW simple cycle power plant started operations in December 2012 and was upgraded to a 225 MW CCPP in July 2014. The Khulna 150 MW simple cycle power plant started operations in October 2013 and was upgraded to a 225 MW CCPP plant in June 2016.
[10] A hot gas path inspection was conducted for two power plants for 30 days during 2015–2016.

obligations.[11] NWPGCL's loan in FY2016–2017 comprised 20% from the government local currency loan and 80% from the foreign currency loan, which exposes NWPGCL to foreign exchange risk. Foreign currency fluctuation losses grew threefold in FY2016–2017 to Tk227 million compared to the previous year.

15. **Liquidity.** As NWPGCL has become increasingly reliant on borrowing to fund its growing capital expenditures, the self-financing ratio (measured as net cash flows from operations divided by 3–year average capital expenditures) declined from 26% in FY2014–2015 to 16% in FY2016–2017. However, from FY2013–2014 to FY2016–2017, NWPGCL maintained (i) a self-financing ratio of 10% (footnote 11) and (ii) a current ratio of 2.2.[12] The earnings before interest, taxes, depreciation, and amortization–interest coverage ratio was 3.3 in FY2016–2017, which means NWPGCL's operations generate sufficient cash flows to meet interest expenses.

16. **Financial projections.** The analysis developed the NWPGCL's financial projections from FY2017–2018 to FY2021–2022 based on the following assumptions:

(i) generation capacity will expand based on the NWPGCL's future development plan, with 2,962 MW of additional capacity from FY2017–2018 to FY2021–2022;
(ii) the tariff applied to each of the planned power plants is based on the cost pass-through principle;
(iii) fuel and other O&M costs were forecast based on current benchmark power plants in Bangladesh and were escalated at 6% per annum for variable cost and 3% per annum for fixed cost; and
(iv) future capital expenditure was assumed to be funded 80% by debt and 20% through equity contributions and self-generated funds.

Table 5: Financial Projections of NWPGCL (Tk million)

Particulars	2017–2018	2018–2019	2019–2020	2020–2021	2021–2022
Balance sheet					
a. Total asset	123,870	184,032	221,184	251,815	257,454
b. Total debt	88,618	132,531	154,867	169,618	157,989
c. Total equity	35,252	51,502	66,317	82,197	99,465
Income statement					
a. Total revenues	37,401	49,539	71,067	91,375	125,792
b. Total expenses	31,207	30,587	53,176	69,057	98,169
c. Profit before interest and tax	6,194	10.952	17,891	22,318	27,622
d. Interest expenses	1,992	2,668	3,447	3,872	3,989
e. Net profit after tax	2,621	5,164	9,047	11,606	14,905
Financial ratio					
a. Operating profit margin (%)	16.6%	22.1%	25.2%	24.4%	22.0%
b. Debt service coverage ratio (times)	2.1	2.4	2.5	2.5	2.5
c. Debt to equity ratio	2.24	2.49	2.24	1.98	1.59
d. Self-financing ratio (%)	21.4	33.2	48.8	59.2	70.5

Tk = Bangladesh currency, taka.
Source: Asian Development Bank estimates.

[11] ADB. 2012. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility and Administration of Grant to the People's Republic of Bangladesh for the Power System Expansion and Efficiency Improvement Investment Program.* Manila. Financial covenants in the loan agreement (Loan 2966-BAN) require that (i) NWPGCL shall maintain a self-financing ratio of 10% from 1 April 2015 onwards based on 3–year moving average capital expenditure, (ii) NWPGCL maintains a healthy debt service coverage ratio of 1.2 from end of December 2019.

[12] Slight decline in current ratio in FY2015**–**2016 is mainly due to increase in current liability of unpaid interest during the construction in Bheramara 360 MW combined cycle power plant.