# SUPPLEMENTARY 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 south-western 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 examined to ascertain whether the FIRR can meet the WACC calculated 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. This analysis also examined the financial sustainability of NWPGCL as an executing agency. It looked at whether it has adequate financial resources to implement and operate the project as well as the repayment of the associated loans. This analysis included (i) a review of NWPGCL's historical financial performance, and (ii) a financial forecast meant to determine whether NWPGCL would have the financial strength to continue to maintain and operate the assets after completion of the project.

## II. FINANCIAL COST-BENEFIT ANALYSIS

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

### A. Component 1 (Rupsha Power Plant)

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 at $1=Tk81;

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

(ii) the analysis was conducted from 2018 to 2046 including 5 years of construction period and the power plant was assumed to have 25 years of operation upon completion;
(iii) an annual plant capacity factor of 70% and 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 at the end of 2021 and the full capacity of 800 MW will be installed at 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 final year of operations and depreciation is calculated on a straight-line basis based on Bangladesh accounting and tax regulations;[2] and
(vi) the corporate income tax rate of NWPGCL is currently 35% and was assumed to remain unchanged over the project 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 comparable power plant in Bangladesh.[3] 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. In the feasibility study for the project, NWPGCL assumed a purchase price of $7.0 per million British thermal units in 2017 prices and increased by 2% annually in real term.

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 recent purchase agreement (footnote 3) allows all the 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%. Under the cost-pass-through tariff methodology,[4] the electricity tariff of the proposed power plant was assumed to average Tk6.4 per kilowatt-hour during the project life.

8. **Weighted average cost of capital**. The WACC for component 1 is estimated at 1.8% as illustrated in Table 1.

**Table 1: Estimated Weighted Average Cost of Capital for Component 1**

| | Item | Development Partner Loans | | Government of Bangladesh | | Total |
|---|---|---|---|---|---|---|
| | | 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 |
| **Weighted Average Cost of Capital** | | | | | | **1.8%** |

[2] The annual depreciation expense was estimated at 5% of the cost of civil works and 10% of the cost of equipment.
[3] Power purchase agreement between NWPGCL and Bangladesh Power Development Board signed in April 2017 for the Bheramara 410 MW CCPP
[4] 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 NWPGCL from the government.[5]

[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 Table 2. For component 1, the FIRR is 6.0% and the FNPV is Tk34,340 million demonstrating its financial viability.

**Table 2: Calculation of Financial Internal Rate of Return for Component 1 (Tk million)**

| Year | Incremental Expenditure | | | Revenue | Net Incremental Cash Flow | | |
|---|---|---|---|---|---|---|---|
| | Investment | Fuel | O&M | Sales of Electricity | Cash Flow Before Tax | Tax | Cash Flow After Tax |
| 2018 | 12,235 | - | - | - | (12,235) | - | (12,235) |
| 2019 | 13,856 | - | - | - | (13,856) | - | (13,856) |
| 2020 | 24,108 | - | - | - | (24,108) | - | (24,108) |
| 2021 | 20,566 | - | - | - | (20,566) | - | (20,566) |
| 2022 | 3,417 | 14,463 | 2,115 | 17,978 | (2,017) | - | (2,017) |
| 2023 | - | 18,386 | 2,649 | 30,977 | 9,942 | 195 | 9,747 |
| 2024 | - | 18,661 | 2,649 | 31,034 | 9,724 | 157 | 9,567 |
| 2025 | - | 18,941 | 2,649 | 31,094 | 9,504 | 148 | 9,356 |
| 2026 | - | 19,226 | 2,649 | 31,155 | 9,281 | 139 | 9,142 |
| 2027 | - | 19,514 | 2,649 | 31,217 | 9,055 | 128 | 8,927 |
| 2028 | - | 19,807 | 2,649 | 31,281 | 8,826 | 117 | 8,709 |
| 2029 | - | 20,104 | 2,649 | 31,345 | 8,593 | 104 | 8,489 |
| 2030 | - | 20,405 | 2,649 | 31,409 | 8,355 | 89 | 8,266 |
| 2031 | - | 20,711 | 2,649 | 31,474 | 8,114 | 977 | 7,137 |
| 2032 | - | 21,022 | 2,649 | 31,537 | 7,867 | 1,863 | 6,004 |
| 2033 | - | 21,337 | 2,649 | 31,600 | 7,614 | 1,843 | 5,771 |
| 2034 | - | 21,657 | 2,649 | 31,661 | 7,355 | 1,821 | 5,534 |
| 2035 | - | 21,982 | 2,649 | 31,720 | 7,089 | 1,796 | 5,292 |
| 2036 | - | 22,312 | 2,649 | 31,775 | 6,814 | 1,769 | 5,046 |
| 2037 | - | 22,647 | 2,649 | 32,690 | 7,395 | 2,038 | 5,356 |
| 2038 | - | 22,986 | 2,649 | 28,165 | 2,530 | 379 | 2,152 |
| 2039 | - | 23,331 | 2,649 | 28,512 | 2,533 | 389 | 2,143 |
| 2040 | - | 23,681 | 2,649 | 28,866 | 2,536 | 389 | 2,147 |
| 2041 | - | 24,036 | 2,649 | 29,226 | 2,541 | 783 | 1,758 |
| 2042 | - | 24,397 | 2,649 | 29,594 | 2,548 | 784 | 1,764 |
| 2043 | - | 24,763 | 2,649 | 29,969 | 2,557 | 786 | 1,772 |
| 2044 | - | 25,134 | 2,649 | 30,351 | 2,568 | 788 | 1,781 |
| 2045 | - | 25,511 | 2,649 | 30,742 | 2,582 | 791 | 1,791 |
| 2046 | (3,709) | 25,894 | 2,649 | 31,141 | 6,307 | 794 | 5,513 |
| | **Financial internal rate of return** | | | | | | **6.0%** |
| | **Financial net present value at weighted average cost of capital of 1.8%** | | | | | | **Tk34,340 million** |

( ) = negative, O&M=operation and maintenance, Tk = Bangladesh currency, taka.

Source: Asian Development Bank estimate

[5] Government of Bangladesh, Ministry of Finance. 2011. *Lending and Re-lending Terms of Local and Foreign Currency Loans*. Dhaka.

10. **Sensitivity and risk analysis**. A sensitivity analysis was carried out to examine the robustness of the FIRR to adverse changes in assumed values of the key variables; the results are summarized in Table 3. Interruptions to gas supply to the power plant in time of completion may cause to delay 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 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 item.

**Table 3: Sensitivity Analysis for Component 1**

| | 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.
Notes: The switching value is the value at which the financial net present value equals zero.
[a] Assumed that the cost overrun was not recovered through tariff.
Source: Asian Development Bank estimates.

## B. Component 2 (Gas Supply Pipeline)

12. **Assumptions**. The financial cost–benefit analysis was conducted for the gas supply pipeline (component 2) under the following assumptions;

(i) all costs and revenues are expressed in 2017 constant prices and converted at $1=Tk81;
(ii) the analysis was conducted from 2018 to 2041 including 5 years of construction period and the gas distribution pipeline was assumed to have 20 years of operation upon completion;
(iii) residual value of assets was computed on a straight-line basis with 5.0% of depreciation rate and to be realized at the end of final year of operations; and
(iv) the corporate income tax of SGCL is presently 35% and was assumed to remain unchanged over the project's life.

13. **Project cost.** The capital cost for component 2 was estimated at Tk658 million excluding price contingency and financing charges during construction. O&M costs were estimated based on the regulatory norms,[6] which comprise of (i) distribution expenses, (ii) customer accounts expenses, (iii) sales expenses, and (iv) administrative and general expenses.

14. **Project revenue**. It was assumed that natural gas distribution tariff will be priced based on the principles set by the jurisdictional regulator, the Bangladesh Energy Regulatory Commission (BERC) (footnote 6). The natural gas distribution tariff computation methodology used annual revenue requirement approach,[7] which is the sum of a return on rate base, plus the sum of the total annual operating costs. The rate base (or qualifying assets) consists of the

[6] Government of Bangladesh. Bangladesh Energy Regulatory Commission, 2010*, Natural Gas Distribution Tariff Regulation,* Dhaka.

[7] The annual revenue requirement for the natural gas distribution business is the sum of return on rate base and the sum of the total annual operating cost including (i) operation and maintenance expenses, (ii) depreciation, and (iii) income tax and other taxes.

depreciated used and useful assets plus, the regulatory working capital. Depreciated assets were computed on a straight-line basis with 5.0% of depreciation rate. The regulatory working capital, which is a measure of funding of daily operating expenditures, is the sum of the cash working capital, materials and supplies inventory, and any prepayment made (rent and insurance). The regulated tariffs allow a full cost pass-through for all associated costs including foreign currency exchange fluctuations.[8]

15. The analysis used the return on equity of 7.5%[9] based on the regulation (footnote 6) and the cost debt of 5% for foreign loan and 4% for government loan (footnote 5). The natural gas distribution pricing regime transfers all but operational risk away from the distribution licensee by ensuring that costs are recovered against approved investments and that investments earn a rate of return. Because the pricing regime considers financing at the project level, it is designed to allow to earn a project FIRR equal to or slightly higher than its WACC.

16. **Weighted average cost of capital**. The WACC for component 2 is estimated at 1.4% as illustrated in Table 4.

**Table 4: Estimated Weighted Average Cost of Capital for Component 2**

| Items | | ADB Loan | Government of Bangladesh Loan | Equity | Total |
|---|---|---|---|---|---|
| A. | Amount ($million) | 4.8 | 1.3 | 2.0 | 8.1 |
| B. | Weighting (%) | 60.0 | 16.0 | 14.0 | 100.0 |
| C. | Nominal cost (%) | 5.0[b] | 4.0[b] | 7.5[c] | - |
| D. | Tax rate (%) | 35.0 | 35.0 | - | - |
| E. | Tax-adjusted nominal cost [C*(1-D)] | 3.3 | 2.6 | 7.5 | - |
| F. | Inflation rate (%)[d] | 1.5 | 6.0 | 6.0 | - |
| G. | Real Cost [(1+E)/(1+F)-1)](%) | 1.7 | (3.2) | 1.4 | - |
| H. | Minimum rate test (I=0%) | 1.7 | 0.0 | 1.4 | - |
| I. | Weighted component of WACC | 1.1 | 0.0 | 0.3 | 1.4 |
| **Weighted Average Cost of Capital** | | | | | **1.4 %** |

( ) = negative, Tk = Bangladesh currency, WACC = weighted average cost of capital.

[a] The nominal cost for foreign loan and Government of Bangladesh loan is based on the onlending rate to SGCL from the government. (footnote 5)

[b] The nominal cost of equity contribution from Government of Bangladesh is calculated as the two-year Bangladesh treasury bill auction rate based on regulations (footnote 6).

[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.

17. **Financial internal rate of return.** The FIRR results are summarized in Table 5. For component 2, the FIRR is 5.3% and the FNPV is Tk318 million, demonstrating its financial viability.

[8] Since repayments of long-term foreign loans received from international financial institutions are accounted for in local currency, utility may incur revenue loss as a result of the fluctuation of exchange rates of the Bangladesh currency.

[9] In the case of licensees, which are wholly or partially owned by the government, the return on equity use the most recent treasury bill auction rate for the two-year Bangladesh treasury bills.

**Table 5: Calculation of Financial Internal Rate of Return for Component 2 (Tk million)**

| Year | Revenue | Expenditure | | | Net Incremental Cash Flow |
|---|---|---|---|---|---|
| | | Capital | O&M | Tax | |
| 2018 | - | 108 | - | - | (108) |
| 2019 | - | 123 | - | - | (123) |
| 2020 | - | 214 | - | - | (214) |
| 2021 | - | 182 | - | - | (182) |
| 2022 | - | 30 | - | - | (30) |
| 2023 | 99 | - | 4 | 21 | 74 |
| 2024 | 96 | - | 4 | 20 | 73 |
| 2025 | 93 | - | 4 | 19 | 71 |
| 2026 | 91 | - | 4 | 18 | 69 |
| 2027 | 88 | - | 4 | 17 | 67 |
| 2028 | 85 | - | 4 | 16 | 66 |
| 2029 | 83 | - | 4 | 15 | 64 |
| 2030 | 80 | - | 4 | 14 | 62 |
| 2031 | 77 | - | 4 | 13 | 61 |
| 2032 | 75 | - | 4 | 12 | 59 |
| 2033 | 72 | - | 4 | 11 | 57 |
| 2034 | 69 | - | 4 | 10 | 55 |
| 2035 | 67 | - | 4 | 9 | 54 |
| 2036 | 64 | - | 4 | 9 | 52 |
| 2037 | 61 | - | 4 | 8 | 50 |
| 2038 | 59 | - | 4 | 7 | 48 |
| 2039 | 56 | - | 4 | 6 | 47 |
| 2040 | 53 | - | 4 | 5 | 45 |
| 2041 | 51 | (36) | 4 | 4 | 79 |
| **Financial internal rate of return** | | | | | **5.3%** |
| **Financial net present value at weighted average cost of capital of 1.8%** | | | | | **Tk318 million** |

( ) = negative, O&M = operation and maintenance, Tk = Bangladesh currency, taka.
Source: Asian Development Bank estimate.

## C. Component 3 (Power Transmission Line)

18. **Assumptions**. The financial cost–benefit analysis was conducted for the power transmission line (component 3) under the following assumptions;

(i) all costs and revenues are expressed in 2017 constant prices and converted at $1=Tk81;
(ii) the analysis was conducted from 2018 to 2046 including 5 years of construction period and the transmission line was assumed to have 25 years of operation upon completion;
(iii) residual value of assets was computed on a straight-line basis with 3.5% of depreciation rate and to be realized at the end of final year of operations; and
(iv) the corporate income tax rate of PGCB is presently 25% and was assumed to remain unchanged over the project's life.

19. **Project cost.** The capital cost for component 3 was estimated at Tk2,353 million excluding price contingency and financing charges during construction. O&M costs were estimated based on the regulatory norms,[10] which comprise of (i) transmission expenses; (ii) customer accounts expenses, (iii) sales expenses, and (iv) administrative and general expenses.

[10] Government of Bangladesh. Bangladesh Energy Regulatory Commission. 2016. *Power Transmission Tariff Regulation.* Dhaka.

20. **Project revenue**. It was assumed that transmission tariff will be priced based on the principles set by the jurisdictional regulator, the BERC (footnote 10). The transmission tariff computation methodology used annual revenue requirement approach,[11] which is the sum of a return on rate base plus, the sum of the total annual operating costs. The rate base (or qualifying assets) consists of the depreciated used and useful assets plus, the regulatory working capital. Depreciated assets were computed on a straight-line basis with 3.5% of depreciation rate. The regulatory working capital, which is a measure of funding of daily operating expenditures, is the sum of the cash working capital, materials and supplies inventory, and any prepayment (rent and insurance). The regulated tariffs allow a full cost pass-through for all associated costs including foreign currency exchange fluctuations, which will be included as an expense.

21. The analysis used the return on equity of 7.5% based on the regulation[12] and the cost debt of 4% for foreign loan and 3% for government loan (footnote 5). The transmission pricing regime transfers all but operational risk away from the transmission licensee by ensuring that costs are recovered against approved investments and that investments earn a rate of return. Because the pricing regime considers financing at the project level, it is designed to allow to earn a project FIRR equal to or slightly higher than its WACC.

22. **Weighted average cost of capital**. The WACC for component 3 is estimated at 1.2% as illustrated in Table 6.

**Table 6: Estimated Weighted Average Cost of Capital for Component 3**

| Items | | ADB Loan | Government of Bangladesh Loan | Equity | Total |
|---|---|---|---|---|---|
| A. | Amount ($million) | 17.3 | 4.7 | 7.0 | 29.0 |
| B. | Weighting (%) | 60.0 | 16.0 | 14.0 | 100.0 |
| C. | Nominal cost (%) | 4.0[a] | 3.0[a] | 7.5[b] | - |
| D. | Tax rate (%) | 25.0 | 25.0 | - | - |
| E. | Tax-adjusted nominal cost [C*(1-D)] | 3.0 | 2.3 | 7.5 | - |
| F. | Inflation rate (%)[c] | 1.5 | 6.0 | 6.0 | - |
| G. | Real cost [(1+E)/(1+F)-1)](%) | 1.5 | (3.5) | 1.4 | - |
| H. | Minimum rate test (I=0%) | 1.5 | 0.0 | 1.4 | - |
| I. | Weighted component of WACC | 0.9 | 0.0 | 0.3 | 1.2 |
| **Weighted Average Cost of Capital** | | | | | **1.2 %** |

ADB = Asian Development Bank, ( ) = negative, Tk = Bangladesh currency, WACC = weighted average cost of capital.
[a] Nominal cost for foreign loan and Government of Bangladesh loan is based on the on-lending rate to PGCB from the government (footnote 5).
[b] Nominal cost of equity contribution from Government of Bangladesh is calculated the two-year Bangladesh treasury bill auction rate based on regulations (footnote 10).
[c] Domestic inflation rate in line with escalation rates published by ADB's Economic Research and Regional Cooperation Department.
Source: ADB estimates.

23. **Financial internal rate of return.** The FIRR results are summarized in Table 7. For component 3, the FIRR is 4.5% and the FNPV is Tk1,191 million, demonstrating its financial viability.

[11] The annual revenue requirement for the transmission business is the sum of return on rate base and the sum of the total annual operating cost including (i) operation and maintenance expenses; (ii) depreciation; and (iii) income tax and other taxes.
[12] In the case of licensees, which are wholly or partially owned by the government, the return on equity use the most recent treasury bill auction rate for the two-year Bangladesh treasury bills.

**Table 7: Calculation of Financial Internal Rate of Return for Component 3 (Tk million)**

| Year | Revenue | Expenditure | | | Net incremental Cash Flow |
|---|---|---|---|---|---|
| | | Capital | O&M | Tax | |
| 2018 | - | 388 | - | - | (388) |
| 2019 | - | 440 | - | - | (440) |
| 2020 | - | 765 | - | - | (765) |
| 2021 | - | 652 | - | - | (652) |
| 2022 | - | 108 | - | - | (108) |
| 2023 | 262 | - | 13 | 40 | 209 |
| 2024 | 256 | - | 13 | 38 | 205 |
| 2025 | 250 | - | 13 | 37 | 201 |
| 2026 | 245 | - | 13 | 35 | 197 |
| 2027 | 239 | - | 13 | 34 | 192 |
| 2028 | 234 | - | 13 | 33 | 188 |
| 2029 | 228 | - | 13 | 31 | 184 |
| 2030 | 222 | - | 13 | 30 | 180 |
| 2031 | 217 | - | 13 | 28 | 175 |
| 2032 | 211 | - | 13 | 27 | 171 |
| 2033 | 205 | - | 13 | 26 | 167 |
| 2034 | 200 | - | 13 | 24 | 163 |
| 2035 | 194 | - | 13 | 23 | 159 |
| 2036 | 188 | - | 13 | 21 | 154 |
| 2037 | 183 | - | 13 | 20 | 150 |
| 2038 | 177 | - | 13 | 18 | 146 |
| 2039 | 172 | - | 13 | 17 | 142 |
| 2040 | 166 | - | 13 | 16 | 137 |
| 2041 | 160 | - | 13 | 14 | 133 |
| 2042 | 155 | - | 13 | 13 | 129 |
| 2043 | 149 | - | 13 | 11 | 125 |
| 2044 | 143 | - | 13 | 10 | 120 |
| 2045 | 138 | - | 13 | 9 | 116 |
| 2046 | 132 | (412) | 13 | 7 | 524 |
| **Financial internal rate of return** | | | | | **4.5%** |
| **Financial net present value at weighted average cost of capital of 1.8%** | | | | | **Tk1,191 million** |

( ) = negative, O&M = operation and maintenance, Tk = Bangladesh currency, taka.
Source: Asian Development Bank estimate.

## III. FINANCIAL ANALYSIS OF NWPGCL

24. **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 the current installed generation capacity of 722 MW[13] and present development activities aims to increase NWPGCL's generation capacity by additional 2,590 MW by 2022. NWPGCL has completed five projects and is currently handling seven projects at various stage including the project and expects to implement eight more projects in the future based on the expansion plan.[14] The review of NWPGCL's historic financial performance used audited financial statements from FY2012–2013 to FY2016–2017.

[13] 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).

[14] Financial Management Assessment (accessible from the list of linked documents in Appendix 7 of the report and recommendation of the President).

25. **Profitability**. NWPGCL's revenue grow rapidly as it added generation capacity from 150 MW in FY2012–2013 to 722 MW in FY2016–2017.[15] NWPGCL has consistently turned a profit, although the gross profit margin declined from 20.3% in FY2013–2014 to 13.9% in FY2016–2017. The decline in profitability in FY2014–2015 from the previous year was attributed to increase in fuel cost due to the expensive diesel-based operation of the Khulna power plant. The electricity generation decreased by 8.7% and revenue decreased by 12.3% in FY2015–2016 compare to FY2014–2015 due to temporary closure of two power plants for inspection.[16] However, in FY2016-2017, the profitability increased again compared to FY2015-2016 due to increased electricity generation.

**Table 4: Financial Performance Indicators of NWPGCL**

| Particulars | 2012–2013[a] | 2013–2014 | 2014–2015 | 2015–2016 | 2016–2017 |
|---|---|---|---|---|---|
| **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, 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 annual reports; and Asian Development Bank estimates.

26. **Debt Service Capability.** NWPGCL's capital expenditures have been growing rapidly as it expands generation capacity. NWPGCL quadrupled its asset from Tk27,502 million in FY2012–2013 to Tk105,793 million in FY2016–2017 while it quadrupled its external borrowings from Tk16,509 million to Tk73,973 million during the same period. Although NWPGCL has been dependent on borrowing to fund its investment, equity contribution from the government helped NWPGCL maintain debt ratio below 70% in FY2016–2017. The debt service coverage ratio remained above of 1.6 indicating that operational cash flows were adequate to serves the debt obligations.[17] NWPGCL's loan in FY2016–2017 comprises 20% from the government local currency loan and 80% from the foreign currency loan, which expose NWPGCL to foreign

[15] The Sirajganj 150 MW simple cycle power plant started operation on 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. The Bheramara 410 MW power plant started its simple cycle commercial operations in May 2017.

[16] A hot gas path inspection was conducted for two power plants for 30 days during FY2015–2016.

[17] ADB. 2012. *Report and Recommendation of the President to the Board of Directors: Multitranche Financing Facility to the People's Republic of Bangladesh for the Power System Expansion and Efficiency Improvement Program.* Manila (Loan 2966-BAN). The financial covenants under the Loan (2966-BAN) states 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.

exchange risk. Foreign currency fluctuation loss grew by three times in FY2016–2017 to Tk227 million compared with the previous year.

27. **Liquidity**. As NWPGCL has become increasingly reliant on borrowing to fund its growing capital expenditures, 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, NWPGCL maintained a self-financing ratio of 10% from FY2013-2014 to FY2016-2017 (footnote 17) and it also maintained a current ratio of 2.2 times from the same period.[18] The earnings before interest, taxes, depreciation and amortization– to interest coverage ratio is 3.3 times in FY2016–2017, which means NWPGCL's operations generate sufficient cash flows to meet interest expenses.

28. **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 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 cost were forecasted based on the 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.

29. **Conclusion.** The main conclusions from the financial review of NWPGCL are that:

(i) Historically, NWPGCL has been profitable and has complied with the financial covenants under the previous loan of debt service coverage ratio of 1.2 and self-financing ratio of 10%;

[18] Slight decline in current ratio in 2015-16 is mainly due to increase in current liability of unpaid interest during the construction in Bheramara 360 MW combined cycle power plant

(ii) As a growing company, NWPGCL has an aggressive investment plan to expand its installed capacity from current 772 MW to 3,684 MW in FY2020–2021;

(iii) Despite this large increase in capital expenditure, the projections suggest that cash generation is sufficient to fund these investment projects with a self-financing ratio of 18% in FY2016–2017 to 64% in FY2020–2021;

(iv) The projection also indicates that NWPGCL will make debt service commitments up to FY2020–2021 despite the rapid increase in external borrowing; and

(v) Under the current cost-pass-through tariff practice, NWPGCL can mitigate losses or risks resulting from cost-overrun and devaluation of the Bangladesh taka during the project life.