FINANCIAL ANALYSIS

A. Introduction

1. The financial evaluation of the proposed investments was carried out in accordance with *Financial Management and Analysis of Projects* of the Asian Development Bank (ADB).[1] The project is to create a 1,365 km high voltage direct current (HVDC) transmission corridor from Chhattisgarh State in the western grid region of India to Haryana State in the northern grid region. This will facilitate transmission of 3,000 megawatts (MW) of electricity of a total generation of about 15,000 MW by independent power producers (IPP) in the state. It will also strengthen the regional distribution network in the northern region of India. The project is to be implemented over a 5-year period and financed by a combination of sovereign and nonsovereign loans from ADB and equity and other borrowing by the Power Grid Corporation of India (POWERGRID). The financial evaluation has considered the cost of the overall investment in all project components and compared this with the financial internal rate of return (FIRR) to ascertain the financial viability of the project.

B. Methodology and Major Assumptions

2. Capital investment required for the project is estimated in Indian rupees using prices prevailing at the end of 2010 and adjusting to arrive at a mid-2011 price level. Capital costs were estimated based on recent procurement data and market sources and include physical contingencies, price contingencies, interest, and other financing charges during construction.

3. Financial viability was examined by comparing the incremental costs and benefits. POWERGRID receives a transmission tariff that is independent of the volume of energy transmitted.[2] The tariff allows a post-tax return on equity (ROE) of 15.5%; an additional ROE of 0.5% if the projects are completed on schedule; an incentive payment for additional performance achieved over the normative system availability for each type of asset; and full cost pass-through for all associated costs, such as interest based on a normative debt-equity ratio of 70:30; depreciation on an accelerated straight-line basis; operation and maintenance (O&M) expenses based on benchmark rates for each asset class; foreign exchange variations; and interest on working capital based on normative rates.

4. The investment costs include the civil works, equipment, land development, environment and social mitigation costs, project management cost, and taxes. Incremental O&M costs have been computed based on regulatory norms. Based on the past trend, working capital requirement for receivables, maintenance spares, and O&M expenses is assumed to be funded through debt. The FIRR has been estimated over a 20-year period, and the residual value of the project assets is computed as a written down value at the time.

C. Financial Internal Rate of Return and Sensitivity Analysis

5. The FIRR is calculated at 9.54% for the investment proposal, which compares favorably with the estimated weighted average of cost of capital (WACC) value of 3.92% in real terms, substantiating the financial viability of the project.

D. Project Level Risk Assessment

6. **External risks.** POWERGRID's return is based on the ROE and the capital cost allowed by the Central Electricity Regulatory Commission (CERC), and reduction of the ROE

[1] ADB. 2005. *Financial Management and Analysis of Projects.* Manila.
[2] Transmission tariff comprises the annual fixed cost of POWERGRID, plus the return on equity and incentive payments.

in the CERC tariff guidelines or disallowance of any component of project cost would negatively affect the project returns. However, the risk is considered limited due to the provisions of the National Tariff Policy that contemplate a full cost pass-through and the past record of the regulator.[3] POWERGRID's offtake risk is minimized due to a multilateral bulk power transmission agreement (BPTA) signed with all the 14 IPPs, which requires the IPPs to provide a bank guarantee until they commence generation of power and thereafter a bank guarantee equal to 2 months' invoicing plus a letter of credit for 105% of the monthly invoicing. Failure of one or more IPPs to start commercial operation would mean that the liability to pay POWERGRID would devolve on the remaining signatories of the BPTA. Once the project is operational, it is expected that IPPs would be in a position to conclude agreements for sale of power in the northern region, which has significant supply shortfalls.[4] The responsibility to pay POWERGRID will then transfer from IPPs to the power purchasers.

7. **Internal risks**. Financial risks at subproject level include (i) increase in prices of equipment, (ii) delays in project implementation,[5] and (iii) failure to have access to necessary counterpart funds. These risks are considered low because (i) the cost estimates are based on most recent market data, (ii) POWERGRID has adequate implementation capacity to implement such large-scale projects on time, and (iii) POWERGRID has demonstrated continued access to domestic resources and has adequate internal resource generation.

E. Sensitivity Analysis at the Project level

8. Adverse movements of several variables, such as increases in capital costs and O&M costs and delays in completion, have marginal impact on the project FIRR, as these are all passed through in tariffs. However, they would have minor cash flow implications, since adjustments in the tariff are made post facto. The FIRR is sensitive to changes in the ROE or incentive elements, which directly affect the profitability. The variables considered for the sensitivity analysis were a 20% increase in capital costs, a 20% increase in O&M costs, a 1-year delay in commercial operation; a 1% reduction in the ROE, and withdrawal of the 0.5% incentive for timely completion (Table 1). Increases in capital costs and O&M cost have a marginal adverse impact on the FIRR. However, even in a worst-case scenario, with a combination of all the above factors, the lower FIRR remains above 8%, and compares favorably with the estimated WACC of 3.92%, substantiating the financial viability of the proposed project.

Table 1: Project Level Sensitivity Analysis

Item	FIRR (%)	FNPV (Rs million)
Base case	9.54	56,626
20% increase in capital cost	9.38	69,028
20% increase both capital and O&M cost	9.16	65,446
20% Increase in both capital and O&M cost, 1-year delay in completion, no incentive for timely completion	8.39	73,648
20% increase in both capital & O&M cost, 1-year delay in completion, no incentive for timely completion, and 1% reduction in ROE	8.13	68,761

FIRR = financial rate of return, FNPV = financial net present value, O&M = operation and maintenance, ROE = return of equity.
Source: Asian Development Bank.

[3] Provision 5.3 (a) to (h) of the National Tariff Policy stipulates performance-based cost of service regulation that assures adequate return on investment and complete pass-through of costs.

[4] Northern region recorded peak shortages of 3,330 MW (8.9%) during FY2011, according to the Central Electricity Authority.

[5] In case of delay in implementation, POWERGRID will be liable to pay liquidated damages to a private generator equivalent to transmission charges that otherwise would have been paid by the generator. However, as per discussions held with POWERGRID, this risk is mitigated because existing lines would be sufficient to evacuate the additional power to be generated by the IPPs until the transmission project is completed. POWERGRID is not required to pay any penalty until it is unable to make alternate arrangements to evacuate the power of IPPs.

F. Historical Corporate Performance and Projections

9. Highlights of POWERGRID's historical corporate performance for the last 5 financial years, and the base case projected performance up to FY2025 are summarized in Tables 2 and 3. The transmission revenue has increased from Rs32 billion in FY2007 to Rs77 billion in FY2011, at a compound annual growth rate of 19%. The post-tax return on equity grew from 11.2% in FY2007 to 12.6% in FY2011. The debt service coverage ratio (DSCR) improved from 1.56 in FY2007 to 1.84 in FY2011. Although the regulator has allowed a debt–equity ratio of 70:30 to POWERGRID for the transmission business, POWERGRID has maintained a more conservative ratio below 70:30 over the last 5 years. The proportion of debt in long-term funds, which increased from 62% in FY2007 to 67% in FY2010, declined to 64% in FY2011 due to the issue of fresh equity during the year. Considered on a 3-year moving average basis, POWERGRID has maintained a healthy self-financing ratio.

Table 2: POWERGRID Historical Audited Corporate Financial Indicators

Item	FY2007	FY2008	FY2009	FY2010	FY2011
Transmission revenue (Rs billion)	32.5	41.9	52.8	65.8	76.9
Revenue growth (%)	11.8	29.0	26.1	24.5	16.9
EBITDA (Rs billion)	34.5	40.3	49.7	61.5	60.3
Other income (Rs billion)	8.5	8.9	8.6	9.3	14.1
Profit after tax (Rs billion)	12.3	14.5	16.9	20.4	27.0
Equity and reserves (Rs billion)	109.5	137.5	148.4	161.4	213.7
Long-term debt (Rs billion)	193.3	222.6	284.7	344.2	408.8
Fixed assets (Rs billion)	218.2	273.6	311.3	320.6	372.2
Total assets (Rs billion)	367.3	432.3	543.2	635.6	657.4
Post-tax ROE (%)	11.2	10.5	11.4	12.6	12.6
Debt service coverage ratio	1.56	1.12	1.75	2.40	1.84
Debt–equity ratio	62:38	60:40	65:35	67:33	64:36
Self-financing ratio (%)	29.0	25.5	28.1	31.4	27.8

EBITDA = earnings before interest, taxes, depreciation, and amortization; ROE = return of equity.
Sources: POWERGRID audited accounts.

10. Table 3 presents the projected financial performance of POWERGRID from FY2012 to FY2025. POWERGRID's aggressive capital investment plan of about $22 billion up to FY2017 will lead to an increase of the turnover from Rs112 billion in FY2012 to Rs348 billion by FY2025, at a compounded annual growth rate of 9%. Given the cost-plus nature of the tariff regime that provides an assured post-tax ROE, POWERGRID's financial indicators remain healthy. The DSCR remains above 1.7 in all the years and the debt exceeds 70% of capital during FY2014–FY2015, before falling back to 70% in FY2016, and lower thereafter. The self-financing ratio also remains well above 20% in all the years. Both the historical performance and the projections indicate that POWERGRID's projected financial position is sound and that it adequately recovers its cost to service its debt prudently.

Table 3: POWERGRID Projected Corporate Financial Indicators

Item	FY2012	FY2014	FY2016	FY2018	FY2020	FY2025
Transmission revenue (Rs billion)	106.7	191.7	264.3	310.3	326.6	329.8
Total revenues (Rs billion)	111.9	198.0	271.9	319.5	337.9	347.7
EBITDA (Rs billion)	94.1	173.2	241.9	285.2	299.6	298.1
Other income (Rs billion)	5.2	6.3	7.61	9.22	11.15	17.96
Profit after tax (Rs billion)	28.1	47.9	69.2	81.3	88.7	101.5
Equity and reserves (Rs billion)	235.3	299.8	397.3	515.1	645.4	1006.6
Long-term debt (Rs billion)	517.9	820.0	1019.2	1208.5	1369.5	1185.7
Fixed assets (Rs billion)	488.9	869.1	1218.2	1344.3	1307.6	1083.1

Item	FY2012	FY2014	FY2016	FY2018	FY2020	FY2025
Total assets (Rs billion)	791.3	1171.4	1490.1	1824.7	2146.9	2409.0
Post-tax ROE (%)	11.9	16.0	17.4	15.8	13.7	10.1
Debt service coverage ratio	1.95	2.02	1.88	1.74	1.72	2.14
Debt–equity ratio	68:32	72:28	70:30	68:32	66:34	52:48
Self-financing ratio (%)	30.0	27.0	42.5	41.9	46.5	NA

EBITDA = earnings before interest, taxes, depreciation, and amortization; NA = no investments; ROE = return of equity.
Sources: POWERGRID and Asian Development Bank estimates.

G. Corporate Level Risk Assessment

11. Under the tariff norms valid from FY2010 to FY2014, cost overruns, interest rate changes, and foreign exchange fluctuations will have limited impact on POWERGRID's profitability as they are to be passed through in tariffs. A negative impact on its financial position could arise if CERC reduces the ROE in future tariff regulations. However, the tariff regulations are set following the National Tariff Policy, which envisages a full cost pass-through and a reasonable return for the investor. The risk of an adverse change to this principle is considered minimal.

12. Liquidity could be affected by delays in collection of revenues resulting from either delayed approval of its tariff petitions and/or bad debts. However, the regulator has allowed POWERGRID to discontinue transmission of power to any utility that has defaulted on payment for more than 90 days. POWERGRID has arranged an adequate working capital facility that would help mitigate the liquidity risk arising from delays in collection. This risk is also mitigated in the longer term by POWERGRID's economically important position as the central transmission utility with public sector ownership. It is expected that CERC and the Government of India would step in at an early date to ensure improved collections.

13. Based on experience in the power sector in India, project implementation delays are moderately likely, as most large transmission projects are directly linked to generation projects. A coordination meeting between POWERGRID and the concerned generating company is periodically monitoring the implementation of all the 14 IPPs to closely match the completion of its transmission lines to the schedule of the associated generation projects. These IPP projects have progressed well and their commissioning is unlikely to come after the completion of the transmission lines.

14. With the introduction of competitive bidding for selection of interstate transmission projects from January 2011, POWERGRID faces a risk of reduced market share if it is unable to win bids. Further, under competitive bidding, POWERGRID will no longer have the security of cost pass-through and will have to stringently monitor its construction, borrowing, and O&M costs. POWERGRID entered into the required agreements prior to 5 January 2011 for the construction of all the 126 projects included in its projection model.[6] POWERGRID has also projected certain cash flows from unidentified projects. However, some portion of these projects may be bid out on competitive basis by the government subject to the performance of the few transmission projects that have recently been awarded on a competitive bidding basis.

H. Sensitivity Analysis at the Corporate Level

15. Sensitivity analysis for key financials were undertaken taking into account discontinuation of the 0.5% incentive ROE for timely completion as well as incentive on availability; reduction in ROE by 1% in each successive tariff period; increased outstanding

[6] Accordingly, these projects will quality for cost-plus tariffs as per the CERC norms.

account receivables to 3 months; O&M expenses increased to 75% of normative levels;[7] delay in new projects by 1 year; and 50% reduction in market share in future projects awarded under competitive bidding.

16. The results show that while the post-tax ROE drops with a reduced ROE and higher O&M, other indicators such as DSCR and debt–equity ratio remain healthy. In case of increased level of receivables, the financials are impacted marginally as overall working capital of POWERGRID increases, thereby increasing its interest on working capital. Impact of project delays is not adverse, as drawdowns are deferred and cost overruns are typically passed through in tariffs. Drop in market share will have limited impact because of a commensurate reduction in capital expenditure. It is observed that even in a worst-case scenario with a combination of all the above factors, the DSCR and debt–equity ratio remain healthy. Table 4 shows the different impacts, in the first year of the tariff periods FY2020–FY2024 and FY2025–FY2029.

Table 4: POWERGRID–Sensitivity Analysis at the Corporate Level

	FY2020			FY2025		
Scenario	**Post-tax ROE** (%)	**DSCR**	**DER**	**Post-tax ROE** (%)	**DSCR**	**DER**
Base Case	13.70	1.72	66:34	10.10	2.14	52:48
Timely completion incentive withdrawn from FY2014	13.40	1.70	66:34	9.80	2.12	51:49
Timely completion incentive and system availability incentive withdrawn from FY2014	12.70	1.68	65:35	9.40	2.09	51:49
Timely completion and system availability incentives withdrawn from FY2014. ROE lowered by 1% in each successive tariff period	11.70	1.61	66:34	8.40	1.95	53:47
Timely completion and system availability incentives withdrawn from FY2014. ROE lowered by 1% in each successive tariff period. Receivables increased to 3 months	11.50	1.60	66:34	8.30	1.94	53:47
Timely completion and system availability incentives withdrawn from FY2014. ROE lowered by 1% in each successive tariff period. Receivables increased to 3 months. O&M expenses increased to 75% of normative levels	11.40	1.59	67:33	8.20	1.92	53:47
Timely completion and system availability incentives withdrawn from FY2014. ROE lowered by 1% in each successive tariff period. Receivables increased to 3 months. O&M expenses increased to 75% of normative levels. Delay in new projects by 1 year	12.20	1.61	69:31	8.80	1.88	56:44
Timely completion and system availability incentives withdrawn from FY2014. ROE lowered by 1% in each successive tariff period. Receivables increased to 3 months. O&M expenses increased to 75% of normative levels. Delay in new projects by 1 year. 50% market share in competitive bidding projects	12.20	1.61	65:35	8.70	1.89	49:51

DER = debt equity ratio, DSCR = debt service coverage ratio, O & M = operation & maintenance, ROE = return of equity.
Source: Asian Development Bank.

[7] Based on the past performance, O&M expenses at 55% of normative levels are considered in the base case scenario.