

Profitability Analysis of Thermal Power Plant A case study

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April 29, 2018

Abstract

A critical analysis is required for existing infrastructure projects to know the accurate profitability position. In this aspect Cost benefit analysis (CBA) is a power full tool for evaluating infrastructure projects. Cost benefit analysis is a process which explains the soundness and certainty in financial decision making. This case study explains the detail profitability analysis of Singareni thermal power project (Phase-2) by using the techniques of Internal Rate of return (IRR), Debt Service Coverage ratio (DSCR) and sensitivity analysis.

Key Words: Profitability, Sensitivity Analysis, Thermal Power project, Debt service coverage Ratio.

1 Introduction

The Singareni Collieries Company Limited (SCCL) is a Government Company jointly owned by the Government of Andhra Pradesh and

Government of India on a 51:49 equity basis. The Singareni coal reserves stretch across 350 km of the Pranahita Godavari valley of Andhra Pradesh with proven geological reserves aggregating to 8791 MT. The studies of Geological Survey of India attribute as much as 22,207 million tonnes of coal reserves in the Godavari valley coalfield. The inventory covers up to a depth of 1200 meters and it includes reserves proved, indicated as well as inferred. The coal produced by SCCL in the Godavari valley coalfield in the year 2006-07 was 31.34 Million tonnes. The targeted production for the year 2007-08 is 36.06 Million tonnes. SCCL also operating small captive power plants since 1960 and recently SCCL is foraying into large-scale power generation. SCCL constructed Nonpithead power station of 1x600 MW units located at Pegadapalli village, Jaipur Mandal in Mancherial district of Andhra Pradesh which was commissioned in the year 2000. The second unit of 1x600 MW will be constructed as an expansion project and will be located adjacent to already constructed and in operation of Stage-I (1x600 MW) units. The project was to be completed within a period of 44 months from the date of the concession agreement. This project construction started on April-2004 and completed by November-2007. Concession period was for 30 years (2002-2032), including construction period. For this purpose, the Special Purpose Vehicle (SPV) was formed in the name of Singareni Thermal Power Project Ltd (STPP-II). The concession agreement was signed between the Singareni Company Collieries Limited (SCCL) and Steag Energy Services (India) Pvt.Ltd (SES). **Operations and Maintenance (O&M) and Fuel Supply Agreement**

The O&M of the power project turned into carried out through SES organization Pvt. Ltd., a subsidiary of SES-USA which has wealthy revel in working and keeping electric producing. It has a huge technology base and adequate experience to attract upon for offering O&M services. It has developed sizable working experience via each its consumer energy application. Its subsidiaries already function numerous unbiased energy vegetation. The O&M settlement had a term of 30 years from the date of industrial operation. The O&M contractor provided the control, operations and maintenance services for the plant. In line with the O&M contract, the offerings can be extensively categorized into 3 sorts, particularly initial working offerings at some point of creation, O&M offerings

for the duration of the operation and control services. The O&M services all through the operation covered operation and preservation of the facility, preparation of annual working budgets, monthly and annual reports on plant performance, monthly invoicing and series of payments on behalf of the organization and preservation of books, records and accounts of the plant. The control offerings consist of accounting, taxes, insurance and treasury factors. **Power Purchase Agreement**

SES originally entered into Power Purchase Agreement (PPA) with SPDC in November 2003. The PPA was subsequently renegotiated; the amended and restated Power Purchase Agreement was entered into with the State Electricity Board in November 2003. Further, two amendments were made to the PPA in October 2004 and January 2005. **Financing of the project**

The estimated cost of the project was Rs. 2867.25 crores. The project achieved financial closure in January, 2004. The project was funded by a debt-equity ratio of 80:20. The term loan component was Rs. 2,200 crores, the nonconvertible debentures component was Rs. 200 crores and the equity component was Rs.600 crores. Out of this equity capital SCCL provides the 400 crores, which is equal to 66.66%and remaining provides by Steag Energy Services (India) Pvt.Ltd (SES). i.e., 200 crores, which is equal to 33.34%.The detailed capital structure is explained table 1.1.

Table 1.1 Capital structure of the Singareni thermal of Power plant.

Particulars	Amount in Rs. crores	Capital structure in %
Debt Component	2,400 (2,200 crores term loan+ 200 crores debentures)	80%
Equity component	600	20%
Total	3,000	100%

Source: STPP, completed projects, Phase-II.

SBI Bank was the lead banker and the lending consortium included several public sector banks such as State Bank of Hyderabad, Union Bank of India, Indian Overseas Bank, Punjab National Bank, UCO Bank, Punjab National Bank, and Industrial Investment Bank of India. The average spread of the loan ranged from

10% to 11.5%. The loan tenure was 14 years, including a construction period of 44 months. The equity funding for the project was primarily through the issue of preference shares. In June, 2003, SCCL raised further debt of amount of Rs.2, 200 crores from a consortium of lenders through securitization of future revenue receivables over a period of fourteen years and group assets of SCCL and Steag Energy Services (India) Pvt.Ltd. These funds were raised at an average cost of 11.52%, which is 3.8% greater than the cost of general debt instruments.

Cost of the Project

The project cost was estimated to be Rs. 2867.25 crore, but the actual cost of the project was 3,000 crores. The detailed break-up of the project cost is provided in Table 1.2.

Table 1.2 Cost classifications of Singareni thermal of Power plant.

Particulars	Total Rs. Crore
Land	18.51
EPC Contract	2193.64
Misc. Capital Expenditures	80.43
Preoperative Expenses	327.78
IDC	338.76
Financing Expenses	40.88
Actual cost	3,000

Source: STPP, completed projects, Phase-II.

The cost estimate for works and supervision of the selected option is based on detailed design, as the works tendered. The land purchase was fully completed by the year 2001. The cost estimate was based on constant prices for the 2000 year. In this total cost Rs. 18.51 crores spend for land purchase, Rs. 2193.64 crores spend on EPC contract of the project, Rs.327.78 crores spend for

preoperative expenses and Rs.338.76 crores spend for IDC of the project. This projected total eligible cost excluding contingencies was Rs.3,000 crores. Out of this eligible cost this power Project gets the debt grant of Rs.2, 200 Crores by financial institutions. It is exactly 73.33% of the total eligible cost.

Revenue from the project

This project is having the only source of revenue that is electricity sales. Revenue is collected from southern power distribution limited. **Financial and Economic Analysis**

The analysis is performed using a 9-year reference period of Singareni thermal power project which is from 2008 to 2016. The financial and economic analyses have been to use constant prices. A real discount rate of 4.5 % is used in the financial calculations, while a 5.0 % social discount rate is used in the economic analysis, in line with the financial institution-wide benchmark set by the Reserve Bank of India.

Table 1.3 Profitability Analysis of the Singareni Thermal Power Plant.

Particulars	2008	2009	2010	2011	2012	2013	2014	2015	2016
Net Revenue	921	1250	1250	1392	1392	1392	1470	1470	1470
Less: O&M and other expenses	668	952	952	940	940	940	996	990	992
PBDIT	253	298	298	452	452	452	474	480	478
Less: Depreciation	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Less: Interest on Debt	190	210	215	275	227	232	290	285	285
PBT	-7.0	18	13	107	155	150	114	125	123
Less: Tax	0.0	3.0	3.9	32.1	46.5	45.0	34.2	37.5	36.9
PAT	-7.0	15	9.10	74.9	108.5	105	79.8	87.5	86.1

Source: STPP limited-financial statements, year 2008-2016 ⁽²⁸⁾.

Table 1.3 shows the profitability analysis of the Singareni thermal power project. This analysis have been measured on the basis of the actual yearly expenses spend by the project deducted from actual revenue collections of the project during 2008 to 2016. This table explicates that the STPP has incurred loss of Rs.7.0 crores in 2008 and later it has started earning profit Rs. 15 crores from 2009 and the same has gone up to Rs. 86.1 crores (2016). But loss in

the year 2008 was due to low revenue and high burden of interest. In the later years it has earned profits because of fewer burdens of interest and high revenue.

Table 1.4 Calculation of IRR and Cost of the capital of the Sigareni Thermal Power Plant.

Particulars	2008	2009	2010	2011	2012	2013	2014	2015	2016
PBDIT	253	298	298	452	452	452	474	480	478
Net cash Inflows	253	298	298	452	452	452	474	480	478
IRR of the Project	18.67%								
Cost of the capital	11.52%								

Source: STPP limited-financial statements in between the years 2008-2016.

Table 1.4 shows the IRR and cost of capital calculations based on the cash flows generated from the actual toll collections and then it is compared with the total investment of the project. Further the IRR is compared with the cost of capital to measure the financial attractiveness of the project. During the study period, STPP has the IRR of 18.67%, at the cost of capital 11.52%, which shows the huge profitability position of the thermal power project. It is also observed that the STPP has the cost of capital 11.52%, was due to huge term loan component in debt capital.

Table 1.5 Calculation of Debt Service Coverage ratio of the Singareni thermal power plant.

Particulars	2008	2009	2010	2011	2012	2013	2014	2015	2016
PBDIT	253	298	298	452	452	452	474	480	478
Add: Additional inflows to unsecured loans	12.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub -total	265	306	298	452	452	452	474	480	478
Total Debt repayment on loans	190	210	215	275	227	232	290	285	285
DSCR for the loan	1.55	1.45	1.38	1.64	1.99	1.94	1.63	1.68	1.67

Source: STPP limited-financial statements in between the years 2008-2016.

Table 1.5 depicted the debt servicing and debt repayment ability of the project. It refers to the amount of cash flow available to

meet annual interest and principal payments on debt, including sinking fund payments. The table explains, that the STPPs DSCR is greater than one (1) during the entire study period and it is varied between 1.38 (2010) and 1.67 (2016). It has been observed that the average DSCR of STPP is 1.67 during 2008 to 2016.

Table 1.6 Sensitivity Analysis of Singareni thermal power Plant.

Particulars	(Actual or existing)	Option-1 (5% Decrease in Debt & 5% Increase in equity)	Option-2 (10% Decrease in Debt & 10% Increase in equity)	Option-3 (5% Increase in Debt & 5% Decrease in equity)	Option-4 (10% Increase in Debt & 10% Decrease in equity)
Debt capital in %	80%	75%	70%	85%	90%
Equity capital in %	20%	25%	30%	15%	10%
Total	100%	100%	100%	100%	100%
Debt Amount in Crores	2,400	2250	2,100	2,550	2,700
Equity Amount in Crores	600	750	900	450	300
Total	3,000	3,000	3,000	3,000	3,000
Project IRR in %	18.67%	19.11%	19.96%	16.23%	14.16%
Avg.DSCR	1.67	2.16	2.93	1.34	1.09

Source: ICRA (investment information and credit rating agency) limited report year-2015.

Table 1.6 explains the sensitivity analysis of the project towards proportionate of change happened in the existing capital structure. Existing capital structure of the project explained in Actual after it is compared with the remaining options considering the unit change in capital structure.

2 Conclusion

It has been observed that at the existing debt equity ratio of 4:1 (i.e. 80% of debt and 20% equity), the STPPs IRR clocks at 18.67%. If the debt capital is increased by 5%, the debt equity ratio would increase to 5.67:1 (i.e. 85% debt and 15% of equity), then the projects IRR would decrease to 16.23% from 18.67% and if the debt capital is increased by 10% the debt equity ratio would increase to 9:1 (i.e.90%debt and 10% equity), then the projects IRR will come down to 14.16% from 18.67%. It is also observed that if the debt capital is decreased by 5%, the debt equity ratio is decreased to

3:1 (i.e. 75% debt and 25% equity), then the projects IRR would increase from 18.67% to 19.11% and if the debt is decreased by 10%, then the debt equity ratio is decreased to 2.33:1 (i.e. 70% debt and 30% equity), then the projects IRR would increase to 19.96%. The existing capital structure of STPP is 4:1 (i.e. 80% of debt and 20% of equity), and its IRR which is 18.67% is worrisome because of the high incidence of debt in the capital structure. To reach a significant increase in the IRR it is recommended to decrease the debt equity ratio from the existing 4:1 (i.e. 80% of debt and 20% of equity), to 2.33:1 (i.e. 70% debt and 30% equity) which increases the IRR from 18.67% to 19.96%, which enhances the profits of the organization. It is also suggested that STPP can increase the debentures component by issuing the project bonds which is only 8.33%, i.e. Rs200 crores in total debt capital of Rs2, 400 crores.

References

- [1] ICRA (investment information and credit rating agency) limited report year-2015.
- [2] STPP limited-financial statements in between the years 2008-2016.
- [3] STPP, completed projects, Phase-II.