

---

## Management Case

---

*describes a situation faced, a decision or action taken by an individual manager or by an organization at the strategic, functional or operational levels.*

---

### Appropriate Return to Equity in Private Power Projects : Case of the Enron Project

Sidharth Sinha

There has been considerable controversy about the appropriate return to equity in private power projects. This case study by Sidharth Sinha discusses the appropriateness of the return to equity in the Enron project.

*Sidharth Sinha is a member of the faculty in the Finance and Accounting Area of the Indian Institute of Management, Ahmedabad.*

The Enron power project is being implemented by the Dabhol Power Company (DPC), promoted in March 1993 as a 100 per cent foreign owned private unlimited liability company incorporated in India by Enron, Bechtel, and General Electric (GE). In Phase I, DPC will set up a combined cycle power plant with an installed capacity of 695 MW at Dabhol, Guhagar taluk, Ratnagiri district, Maharashtra. The plant will operate on distillate fuel oil and/or natural gas. The power generated by the plant will be sold to the Maharashtra State Electricity Board (MSEB). The cost of the project is estimated at Rs 3029 crore (US \$ 946.55 million). There is also a plan to expand the generating capacity from 695 MW to 2015 MW at a later stage under Phase II.

The project was initiated in response to the Indian government's invitation in May 1992 for foreign investment in the power sector. In June 1992, the Congress government of Maharashtra, led by Chief Minister Sharad Pawar, signed a Memorandum of Understanding with Enron, Bechtel, and GE. DPC was made a subsidiary of Enron in March 1993. The critical Power Purchase Agreement (PPA) between DPC and MSEB was signed on December 12, 1993. The other important agreements were signed in 1994 and early 1995 and work on the project commenced in February 1995. The Congress government in Maharashtra was defeated in the state polls in March 1995 and a new government of the Bharatiya Janata Party (BJP) and Shiv Sena came to power. The two parties, as a part of their election manifesto, were committed to terminating the agreement with Enron. A committee led by the Deputy-Chief Minister recommended scrapping of the project. Finally, the government scrapped the project on August 3, 1995. Enron subsequently sued the government for damages and simultaneously attempted to renegotiate the project with the government.

The project was renegotiated and some of the pending lawsuits against Enron and the Government of Maharashtra were finally disposed off by the Maharashtra High Court in December 1996. This case uses the data of the original project and concentrates on issues relating to the return to equity-holders in the Enron project.

## Promoters

Dabhol Power Company has been promoted by Enron, GE, and Bechtel, all based in the USA.

Enron is the holding company for a number of affiliates engaged in the area of oil and natural gas exploration, production, and marketing; gas pipeline operation; and power plant design, engineering, operation, and financing. The main companies of Enron are Enron Gas Services, Enron Operations Corporation, Enron Oil and Gas Company, and Enron International Inc. Enron along with its affiliates earned a revenue of US \$ 7.972 billion for the year ended December 31, 1993, on which it earned a net profit of US \$ 333 million.

Bechtel is an engineering and construction company with presence in various industries like oil/gas, power, engineering, construction, and financial services. The sales of the group for the year ended December 31, 1992, was US \$ 7.8 billion.

GE is engaged in the manufacture of aircraft engines, medical and diagnostic equipment/systems, equipment for electrical generation, transmission and distribution, motors, home appliances, etc. It is the largest manufacturer in the world of steam and gas turbines for power generation. For the year ended December 31, 1993, it earned a revenue of US \$ 60.562 billion on which it earned a net profit of US \$ 4.135 billion.

The three promoters have set up Mauritius based private unlimited companies — Enron Mauritius Company (Enron), Power Enterprises Mauritius Company (Bechtel), and GE Capital India Power Mauritius Limited (GE). The Enron company will hold 80 per cent of the shares of DPC and the Bechtel and GE companies will each hold 10 per cent shares.

## Construction and Operation

DPC has engaged the services of a consortium of GE and Bechtel companies for plant construction on a fixed price turnkey basis. The price is not subject to escalation except on account of changes in duties/taxes and changes in scope of the project. If the turnkey contractors are not able to demonstrate the minimum performance levels in the performance tests on or before the guaranteed completion date, liquidated damages for delay, shortfall, etc. become payable. As per the construction contract, Bechtel would be constructing two jetties — construction jetty and fuel jetty. The construction jetty will be used for receiving equipment and material.

Offshore Power Operations C V Netherlands, an

Enron subsidiary, have also been appointed as the Operation and Maintenance (O&M) contractor. The O&M contractor would be responsible for operating and maintaining the plant by appointing suitably qualified and experienced personnel. The objective of the operator would be to minimize operating costs and optimize the plant availability, capacity, and efficiency. Both DPC and O&M contractor would define target heat rate and availability criteria and, based on actual performance, bonuses/damages are payable/receivable.

The plant would be fuelled by imported distillate obtained from the international market. Enron Fuels International Inc., an affiliate of Enron, is being appointed as Fuel Manager who would negotiate the price, arrange delivery of the fuel to the site, storage, and maintenance of all fuel and related facilities.

The company will obtain a range of insurance policies covering various risks during both the construction and the operating stages.

## Power Purchase Agreement

MSEB is the principal buyer of the power to be generated by the company. DPC has entered into a Power Purchase Agreement (PPA) with MSEB whereby MSEB has agreed to purchase the entire power generated by DPC.

According to the PPA, capacity payments are made through fixed charges and energy payments through variable charges. The capacity charge would consist of fixed operation and maintenance charge to cover fixed O&M costs, and capital recovery charge to cover debt service, taxes, and returns to shareholders. Energy charge would comprise fuel payment, variable O&M charge, fuel management fee, and hot and cold start fee. There would be rupee and dollar stream of payments. As per the PPA, DPC guarantees an availability of 92 per cent during the peak season (October 1-May 31) and 86 per cent during the off-peak/monsoon season (June 1-September 30). Penalties are payable if the company does not meet the guaranteed availability and bonus if availability levels are exceeded and MSEB utilizes the availability.

The Government of Maharashtra has guaranteed the payments due to DPC from MSEB for the power purchase. The Government of India has also provided a counter guarantee for the payment due to DPC in case of a failure to pay both by MSEB and the Government of Maharashtra. A break-up of the project cost is given Table 1.

**Table 1: Project Cost and Means of Finance**

Figures in Rs Crore	Total Amount	Foreign Currency
Land Including Development	78.4	
Plant, Machinery and Infrastructure	1871.2	1305.8
Additional Taxes	48	
Technical Consultancy	35.2	35.2
Miscellaneous Fixed Assets	51.2	44.8
Development Fee	86.4	86.4
Preliminary Expenses	62.72	62.4
Pre-operative Expenses	547.26	365.7
Contingency	160	160
Working Capital	87.82	87.82
<b>Total</b>	<b>3028.2</b>	<b>2148.12</b>

The project is proposed to be financed in the following manner:

Rs Crore (US \$ mn)			
<b>I. EQUITY</b>			
a) Promoters			
- Enron * (80%)		726.88	
		(227.16)	
- Bechtel * (10%)		90.86	
		(28.40)	
- GE * (10%)		90.86	908.60
		(28.40)	(283.96)
<b>b) DEBT</b>			
	Rupee Loan	FC Loan	
- AIFIs	700.00		
	(218.75)		
- US Exim Bank		966.00	
		(301.84)	
- Overseas Private Investment Corporation (OPIC)		240.00	
		(75.00)	
- US Bond Issue		214.40	
		(67.00) <sup>@</sup>	
<b>Total</b>	<b>700.00</b>	<b>1420.40</b>	<b>2120.40</b>
	<b>(218.75)</b>	<b>(443.84)</b>	<b>(662.59)</b>
			<b>3029.00</b>
			<b>(946.55)</b>

\* Through their affiliates.

(Figures in bracket indicate US \$ in million based on the exchange rate of 1 US \$ = Rs 32)

@ DPC has stated that the US Bond issue may be revised upwards up to US \$ 150 million. In that event, other loans would be reduced correspondingly.

## Return to Equity in the Enron Project

The government's new power policy provides for 16 per cent Return on Equity (ROE) at 68.5 per cent Plant Load Factor (PLF). Incentives are prescribed for performance beyond this PLF in the form of additional ROE of 0.7 per cent for each 1 per cent rise in PLF. ROE is defined as the Profit After Tax (PAT) as a percentage of Net Worth, i.e., the book value of equity. However, the Enron project does not work with ROE as allowed by government policy but on the basis of a guaranteed tariff. The PAT numbers for the Enron project are given in Table 2. In the Enron project, the ROE varies from year to year and ranges from 15.43 per cent in the first year to 44.16 per cent in the sixth year and then declines to 36.78 per cent in the ninth year, the last year for which forecasts are available. As per the government guidelines at 90 per cent PLF, at which Enron expects to operate, the allowable ROE would have been 31 per cent. However, it is not meaningful to compare Enron's varying ROE with this benchmark because of problems of time value of money.

The Internal Rate of Return (IRR) provides an alternative measure of the returns earned by equity-holders. Since the PAT is an accounting number, it does not represent the cash flows earned by equity-holders. ROE also does not take into account the time value of money. Therefore, investors usually evaluate their investment not on the basis of ROE but the IRR. The IRR is estimated using cash flows to equity rather than PAT. For the Enron project, equity cash flows are obtained from the PAT numbers by adding back depreciation and subtracting cash flows related to maintenance and general operating reserves and loan repayments. The Net Present Value (NPV) of these cash flows is the amount by which the value of future cash flows exceeds the initial investment. The value of future cash flows is obtained by discounting them at the opportunity cost of capital. The IRR can be understood as a break-even cost of capital. It is the discount rate which gives a zero NPV. If the actual cost of capital is below the IRR, the NPV is positive; if the cost of capital is above the IRR, the NPV is negative. Investments with a positive NPV or with an IRR greater than the cost of capital are desirable for investors.

It is more meaningful to look at the IRR of equity investment than the ROE because the IRR (a) is based on cash flows and not accounting numbers, (b) takes into account the time value of money, and (c) can be compared with the cost of capital of an investment. There are several conceptual and practical problems in implementing this methodology. First, in the case of most private power projects, the debt-equity ratio

**Table 2: Cash Flow Projections**

(Figures in Rs lakh)

	1997	1998	1999	2000	2001	2002	2003	2004	2005
Profit After Tax	14020	18937	24119	29355	34696	40130	37619	33870	33419
Return on Equity	15.43%	20.84%	26.54%	32.31%	38.18%	44.16%	41.40%	37.27%	36.78%
Dividends	14019	18937	24120	29355	34696	40131	37620	33869	33419
Dividend (%)	15.43%	20.84%	26.54%	32.31%	38.18%	44.16%	41.40%	37.27%	36.78%
<b>Cash Flows</b>									
Profit After Tax	14020	18937	24119	29355	34696	40130	37619	33870	33419
Add: Depreciation	23432	23432	23432	23432	23432	23432	24652	24652	24652
Gross Cash Accruals	37452	42369	47551	52787	58128	63562	62271	58522	58071
Repayment of Term Loans	19833	20848	20848	20509	20510	20509	20510	20509	20510
<b>Contributions to</b>									
Maintenance Reserve	2318	2376	2435	2496	2559	2623	2688	2755	2825
General Operating Reserve	1280								
Equity Cash Flows	14021	19145	24268	29782	35059	40430	39073	35258	34736

Note : Equity investment is Rs 908.68 crore. Return on equity and dividend percentage are calculated on this equity base.

diminishes steadily as the debt is paid off and the project company makes no new investments beyond routine investment. This is also the case with the Enron project. Given the project risk, a decrease in leverage will be associated with a decrease in the risk of equity over the life of the project. Additionally, project risk itself changes over the life of the project. Project risk is significantly higher in the development and construction phase. Once construction is over and the plant begins supplying electricity, the project risk and equity risk will be lower. This creates a problem in choosing the appropriate benchmark against which the project returns are to be evaluated. Second, there are conceptual problems in identifying the benchmark rate of return. The textbook approach of using the Capital Asset Pricing Model (CAPM) is unlikely to be useful. The validity of the CAPM for the Indian capital markets is yet to be established. In fact, questions are being raised about its validity even for the well developed US and European markets. Moreover, given the unique risk contracting arrangements of private power projects, the betas of existing private power companies, such as Ahmedabad Electricity Company and CESC, are unlikely to be useful.

Calculating the IRR of equity investment requires assumptions about the timing of initial investment and the terminal value of equity. Assuming a three year gap between the equity investment and the first cash flows and a terminal value of equity at the end of nine years of operation equal to the initial equity investment, the

IRR works out to 18.79 per cent. The three year gap is based on the 33 month construction period guaranteed in the PPA. The initial equity investment is taken as the terminal value of equity since no reserves are being created during the forecast period. The same terminal value of equity will be obtained by subtracting the book value of terminal debt from the book value of terminal assets. If the gap between the equity investment and the first cash flow is reduced to two years, the IRR increases to 22.12 per cent. This assumption may be more appropriate if the entire equity investment is not made at the beginning but uniformly spread over the construction period.

### Appropriate Return to Equity

The next question is the appropriate cost of capital or the benchmark return against which the IRR to equity should be compared. This will depend upon the risk associated with the IRR of equity investment or the spread of the distribution of the actual IRR around the estimated IRR. The estimated IRR is based on a number of assumptions. If these assumptions do not hold, then the actual IRR will deviate from the estimated IRR.

The key assumptions underlying the cash flows estimates and the impact of deviations from these assumptions on cash flows are analysed below:

**Cost of project and time to completion:** Equity investors do not bear the risk of cost and time overrun since DPC has entered into a fixed price turnkey contract

with a guaranteed completion date. The penalties for non-performance by the contractors are sufficient for DPC to pay the penalties to MSEB as well as cover other costs incurred by it.

*The plant is assumed to run at 90 per cent PLF, at a capacity of 625 MW. The assumed heat rate is 7401 Btu/Kwh in the first year and 7504 Btu/Kwh by the tenth year:* The turnkey contractors are required to demonstrate minimum performance levels in the performance tests on or before the guaranteed completion date. For shortfalls in performance, there are liquidated damages. Once the plant is in operation, it will be the responsibility of the O&M contractor to meet the availability criteria and target heat rate laid down by DPC and, based on actual performance, bonuses/damages would be payable, receivable. The heat rate permitted by MSEB is 7605 Btu/Kwh. Thus, DPC effectively does not bear the risk of capacity shortfalls or shortfalls in operating performance.

*Exchange rate is assumed at Rs 32/US \$:* MSEB will make two categories of payments to DPC — energy payments and capacity payments. Energy payments include fuel management fees (US \$ denominated), variable operating costs (US \$ and Rs denominated), and fuels costs (US \$ denominated). Capacity charge covers fixed O&M expenses (US \$ and Rs denominated), and debt service and return to equity (US \$ denominated except for rupee debt). The dollar denomination of appropriate amounts of energy payments and capacity payments to cover dollar costs and returns ensures that DPC and the equity investors do not bear any exchange rate risk. Therefore, the estimated IRR is a dollar denominated IRR since the entire equity investment is in dollars.

*Risk of increases in costs:* Fuel costs are to be recovered on actuals. All other dollar denominated expenses are escalated at US inflation rates and rupee denominated expenses are escalated at Indian inflation rates. Therefore, the only risk faced by DPC is that the actual increase in costs will be higher than the inflation rates.

*Interest cost:* All loans have a fixed rate of interest so there will be no variations in interest cost.

*Taxes and changes in law:* There is a provision in the PPA to compensate DPC fully for changes in law and changes in taxes.

Therefore, so long as DPC receives payments from MSEB according to the PPA and all other contracting parties — the O&M contractor and the turnkey contractor — honour their agreements, equity investors will earn the estimated IRR. Payments from MSEB are first

guaranteed by the Government of Maharashtra and counter guaranteed by the Government of India. Therefore, the risk of receiving payments from MSEB reduces to sovereign risk. The risk of the contractors defaulting is minimal. GE and Bechtel, the turnkey contractors, also each hold 10 per cent of DPC equity. The O&M contractor is an affiliate of Enron.

Therefore, even though the Enron project does not have an explicitly guaranteed rate of return, given the tariff calculations and the indexing of various payments, equity investors in the Dabhol project face the same risk as the equity investors in projects with 16 per cent guaranteed return. This is basically the risk that MSEB does not make payments as per the PPA and the Government of Maharashtra and the Government of India do not honour their guarantees. In fact, for MSEB, the two arrangements are hardly distinguishable and require the same analysis and negotiation. Both the arrangements will ultimately get evaluated in terms of the IRR once capital and operating costs have been agreed upon.

## Conclusion

Based on this analysis, the appropriate return to equity holders should not be much greater than the cost of foreign debt given the PPA and the counter guarantee by the Government of India. All risks have been passed on to MSEB, the turnkey contractors, and the O&M contractor. Payments by MSEB as per the PPA have been guaranteed by the Government of Maharashtra and counter guaranteed by the Government of India. The cost of foreign debt assumed in the Enron project is 10-11 per cent. This is not the risk free rate but a rate which takes into account default risk. The IRR of equity worked out earlier, therefore, implies a risk premium of 8 per cent — 12 per cent over the interest rate on risky debt.

While it is not possible to precisely evaluate the appropriateness of the equity premium, given that the risk to equity is similar to the risk on debt, i.e., default by MSEB, Government of Maharashtra, and Government of India and possibly by other contracting parties, the premium for equity appears excessive. This conclusion is confirmed by a recent McKinsey study by Chia and Mallick (1996). According to this study:

“Independent Power Producers (IPPs) have been asking developing countries to pay higher prices than developed countries. In the United Kingdom and Australia, the wholesale price ranges from 3 US cents to 4 cents per Kwh, while developing countries pay between 5.3 US cents and 8.2 US cents. Such high prices are largely attributable to

the high returns that developers have come to expect. They remember a fledgling industry when proven players were few, new capacity was urgently needed, and interest rates were high. Pioneers were able to earn exceptional returns, often as high as 16 per cent.

Today's environment is different. Long-term bond yields in US dollars have slumped, and the nominal cost of capital on full project funds can be expected to fall to about 9 per cent per annum. If investment is to be encouraged, developers need to earn higher rates than this, but even so, the 18 per cent return that many expect seems high — certainly higher than their average cost of capital."

Many observers point to the problems that Enron has had in negotiating the Dabhol project as an example of the high risks in power projects in developing countries and, therefore, the need for high returns.

However, it may also be argued that the problems faced by the Dabhol project may have been a result of the high returns sought by equity investors. These high returns may have partly contributed to the opposition to the project. As argued in a recent article by Wells and Gleason (1995),

"Popular wisdom has it that high risk may bring high returns, but the paradox of infrastructure projects may be that it is higher returns that cause higher risk."

#### References

- Chia, Mickael and Mallick, Rob (1996). "Why Power Projects Get Stalled," *The McKinsey Quarterly*, No 2.
- Wells, Louis T and Gleason, Eric S (1995). "Is Foreign Infrastructure Investment Still Risky?" *Harvard Business Review*, September-October.