

The Enron Controversy:
Techno-Economic Analysis and Policy Implications

Girish Sant and Shantanu Dixit
PRAYAS

Subodh Wagle
CEEP, University of Delaware, USA

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Glossary

BHEL:	Bharat Heavy Electricals Ltd.
Bus-bar:	Point at which power is fed to the grid by a power plant
CEA:	Central Electricity Authority
Co-generation:	Efficient generation of power and steam simultaneously (usually in industry)
Go/GoM:	Government of India / Maharashtra
GT:	Gas Turbine (used for power generation)
IPP:	Independent Power Producer
IRR:	Internal Rate of Return (a measure of profitability)
MSEB:	Maharashtra State Electricity Board
NTPC:	National Thermal Power Corporation
PLF:	Plant Load Factor (capacity utilisation)
SEB:	State Electricity Board
Lakh:	100 thousand
Million:	1000 thousand
Crone:	10 Million
\$:	U.S. \$ = 32 Rs (in 1995)
kWh:	one Unit of electricity
MW:	Million Watts (power)

Preface

PRAYAS is a voluntary initiative in the fields of energy, health, and learning and parenthood. Members of the Development & Energy Group of PRAYAS have been working on various issues in the power sector for last four years. The major effort was a two and half year study on alternative planning for the power sector of the state of Maharashtra in India. A report based on this study entitled: "Least Cost Power Planning: Case Study of Maharashtra State" provided an opportunity to enter into dialogue with officials, researchers, and activists on problems and prospects of power sector in Maharashtra. When the Enron controversy erupted, it was quite logical for us to initiate a study of the deal from techno-economic and policy perspectives. The Power Purchase Agreement (PPA) between Dabhol Power Company (DPC) and Maharashtra State Electricity Board (MSEB) was made public in March 1995. This served as an impetus for intensifying our efforts.

Power sector policies are especially marked by their techno-economic esoterica and their mystification. In this context, the Enron controversy, on one hand, posed a challenge as it created an urgent need to take issues related to the power policy to people in the form and language that would not alienate them. On the other hand, the controversy brought about an excellent opportunity as a wide section of people and a broad range of organisation started taking keen interest in the affairs of power sector. While remaining true to our brief, we tried to continually expand and refine our analysis as it has been very difficult to gather relevant information. Simultaneously, we also tried to vigorously interact with various researchers, government officials and various people's organisations working on this controversy in order to understand their anxieties, priorities, and interests and also to provide analytical inputs and disseminate the results of our analysis.

We had planned to write a single comprehensive and coherent paper covering all techno-economic aspects in detail and publish it in a booklet form. However, with the appointment of the Cabinet Sub-Committee to review the Enron deal and with intensification of struggle by local people, we felt that we should immediately present the work we have already done to a larger audience so that a wide variety of people could participate in the ongoing debate more effectively and decisively. This prompted our decision to come out with this collection of five independent papers. Being a product of a heated controversy and being

produced when the controversy is still raging, this work does have certain limitations. However, we feel that it would certainly serve its above-mentioned purpose very well.

We wish to express our gratitude for guidance and help from many of our seniors and friends including: Dr Sulabha Bramhe, Mr Sambamurthy, Mr Ashok Rao, Dr Arvind Lele, Mr Kannan Srinivasan, Mr N S Divekar and many other friends. We are also grateful to Dr Sulabha Bramhe, Dr Rangan Banerjee, Dr S Rajgopalan for their valuable comments and suggestions on the initial drafts of some of the papers.

Subodh Wagle also wish to acknowledge the help and support received from Dr. John Byrne, Director, Center for Energy and Environmental Policy , University of Delaware.

Shantanu Dixit
June 13, 1995.

Girish Sant

Subodh Wagle

Preface to the Reprint

Our booklet received an overwhelming response, from all sections of society in India and abroad, requiring a reprint in just over three months. These three months have seen unprecedented activities in the Indian power scene.

On August 3,1995, The GoM announced the cancellation of second phase of Enron project, and repudiated first phase. Following this Enron has initiated an arbitration process, to seek compensation in excess of \$ 300 Million. And is simultaneously trying to renegotiate the deal by offering significant reduction in tariff by reducing the capital costs and using cheaper Indian Naptha as fuel. Enron has said that claim by Ms Powers (referred in this booklet), of spending \$ 20 Million to educate Indian officials, was a mis-representation and she no more works with the company. But it has failed to give a convincing explanation of this expenditure. On September 6th, the GoM has appealed to the court, seeking cancellation of the MSEB-DPC contract. The grounds on which the government has appealed are (i) that the contract is against the public policy, and (ii) has been awarded based on the wrong and misleading information.

The private power projects in general and the fast track projects in particular, are engulfed in controversy. Some private promoters have offered to reduce the capital cost significantly. The power projects are getting delayed but their cost are coming down.

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Earlier it was widely believed that cancellation of Enron project will have a large international backlash. Foreign investors will shy away and higher interest on international loan due to increased risk perception was predicted. We have been arguing that this was a false bogey. Our prediction has come true. The Mittals have negotiated a loan at a very attractive terms.

MSEB has initiated plans to involve the Indian public and private sector for joint venture projects in a bid to reduce the cost of the power projects. We had pointed to the fact that the decentralised power plants are cheaper and have short gestation time, and are appropriate choice at the present time. Many SEBs have started actively promoting the decentralised power plants.

With plans getting delayed the power situation in Maharashtra does not look bright for the immediate future. We hope MSEB acts on the suggestion to encourage the cogeneration and other small power plants; and actively initiate plans for demand management and loss reduction.

More information has become available on Dabhol project, and there is an urgent need to draw an alternate power plan by updateing our earlier study on 'Least Cost Plan' for Maharashtra, but we are unable to pursue this due to the lack of funds and time.

This reprint incorporates only small changes in section 2.3 and 3.2.1.2 of the first article, apart from the grammatical corrections. The conclusions remain valid and rather have been strengthened by the additional information now available. We owe special thanks to Mr Ajit Gaunekar, Mr Sanjay Pendse, Dr Anupam Saraph and Mr Abhay Mehta for improving this reprint.

September 10, 1995.

About the Enron/DPC Project

- Type of plant :** Combined Cycle Gas Turbine (CCGT)
Fuel : Distillate Oil (Phase I) and LNG (after Phase II)
Capacity : 695 MW (Phase I), additional 1320 MW (Phase II)
Location : Near Guhagar, Dist. Ratnagiri, about 170 Km South of Bombay.
Promoters : Subsidiaries of Enron Corporation, USA, General Electric and Bechtel Inc. with equity holding of 80, 10 and 10 percent respectively.
Capital Cost : Phase I — US \$ 910 Million, (with equity of \$ 266 Million).
Sole Consumer : Maharashtra State Electricity Board (MSEB)
MOU signed on : 20th June 1992.
PPA signed on : 8th December 1993.
Financial Closure : 1st March 1995.
Expected Commissioning : End of 1997.
Contract Period : 20 Years.

Summary

This collection of papers and articles is an outcome of our efforts to study the Enron controversy from techno-economic and policy perspectives. It must be noted that we have not touched other equally important aspects of the controversy including: environmental, displacement related, legal etc.

This collection comprises three main sections: (a) a technical paper on techno-economic analysis of the PPA between DPC and MSEB, (b) following three papers on analysis of three other policy issues that acquired special significance during the debate; and a brief overview of problems and challenges in power sector policies in India.

The PPA between MSEB and DPC could be termed as the most controversial document in the history of Indian power sector. It was kept as a “zealously guarded secret” by DPC and even the earlier state government. In the elections for state legislative assembly, there was a change in government and DPC, sensing tough times ahead, decided to make the PPA public. Though it had already achieved a kind of notoriety, when PPA was finally released it virtually opened the Pandora’s Box. In the ensuing confusion created by agitations, public debate, lobbying, and above all a lot of wrong information, we tried to keep ourselves focused on the analysis of the PPA. Findings of our analysis are presented in the first paper on the analysis of PPA. Despite our efforts, because of the nature of the PPA itself, this article has remained somewhat difficult for a lay reader. The following brief summary could be helpful in this context.

Some of the salient findings of our analysis :

- (a) The DPC is said to be liable for stringent penalties in case of non-performance such as time over-run, capacity short fall etc. DPC passes on most of these penalties to its contractors. It is not likely to pay anything from its pocket and in some cases (of non-performance) even earn profits.
- (b) According to our calculations, the internal rate of return (IRR - an indicator of profitability) for DPC is exorbitantly high, to the tune of 28% (post-tax, real). This is equivalent to over 40% flat rate of return in dollar terms. In short, this means that we will be borrowing capital from Enron at exorbitant rate of about 38% in rupee terms.

According to the recommendations of Vanguard Capital, the consultant appointed by Government of India, IRR of 17% to 21 % (post tax, real) is adequate to attract foreign investment in power sector even after considering perceived high-risk.

- (c) The higher capital cost, together with the above-normal rate of return described above, would result in “excess payments” of about Rs. 1,100 to 1,400 crore (\$ 350 to 425 million) to Enron as a one time payment in 1996 currency.
- (d) The tariff structure stipulated in the PPA is very complex. It is backloaded, in the sense that it has an in-built rise of 4%. In addition, tariff would be affected by depreciation of rupee against dollar and plant load factor (PLF). We have plotted tariff for the project period (1997-2017) for a few possible scenarios (for PLF 70% and 90% and for rupee depreciation rate of 4% and 6%).

In these scenarios, the price of electricity from Enron varies from Rs. 2.55 (8 cents) /kWh (1997) to about Rs. 12 (12 cents) /kWh (2016). Thus, the oft-quoted rate of Enron’s electricity, Rs.2.4/kWh is quite deceptive. If required for comparison, the most realistic and representative price of Enron’s electricity is Rs. 4.18 (about 13 cents)/ kWh at busbar i.e. at the doorstep of the Enron plant and about Rs. 5.5 (17 cents) /kWh at the doorstep of an average consumer. This is the levelised tariff for 70% PLF and 4% Rupee depreciation.

Coming to the three subsequent papers, we have discussed three policy issues that became important in the debate. In our discussions with people in the new government as well as with individuals and organisations engaged in the debate and struggle, we felt that these issues need to be dealt with in detail. The following three papers deal with three such policy issues: (a) Issue of overall economics of the first stage of the project; (b) Issue of alternatives to the Enron project; (c) Issue of international image.

The second paper, provides a detailed rejoinder to an article written by the well-known energy economist and Director of the Indira Gandhi Institute of Development Research Dr Kirit Parikh in Times of India (28th April 1995). In the article, Dr Parikh inferred that cancelling the first stage of the project would make “little economic sense” and, hence, the first stage should be given the green signal. Before writing this article, Dr Parikh had been a consistent critic of this project. This necessitated a proper rejoinder of his argument and inference. Using Dr Parikh’s methodology and by pointing out some crucial missing

elements, our paper arrived at the conclusion that, cancelling even the first stage makes economic sense.

With increasing analytical evidence as well as popular protest against the project, another argument was put forth. It was argued that there are no techno-economically viable and immediately implementable alternatives to the Enron project. Further, it was also argued that in the era of financial crunch, we have no other way for arranging finance but to go to some MNC like Enron. The third paper deals with this issue in detail. First, it argues that there are techno-economically viable, socio-environmentally less damaging, and practically feasible “immediate” as well as “long-term” alternatives to the Enron project. Secondly, it points out practical options to raise finances at a fair rate.

There has been a genuine fear in the minds of many that if the Enron deal were cancelled, the international business community (i.e. MNCs) will react sharply and the flow of foreign capital to India will get restricted. In our presentations and dialogues, we tried to dispel this bogey of international backlash with three main arguments. These are presented in the second paper dealing with the arguments of Dr Parikh under the sub-title: International Credibility.

Through our like-minded friends in Europe, we came across a shocking testimony by a top Enron official to a committee of U.S. House of Representatives. The testimony which cited Enron’s Dabhol project contained many questionable statements and unsubstantiated claims without any basis in reality. Thus, in the context of the bogey of international back-lash, the fourth paper “MNCs, New Development Messiahs ..”, investigates claims of Enron about providing development assistance to India and reveals the contemptuous attitude of Enron towards India and Indians.

After dealing with the Enron controversy in detail, we felt it is necessary to present it in a larger context of power policy in India. The paper argues that the Enron controversy is a mere symptom of a deeper malice affecting the entire power sector. And hence, the new onslaught of private power project is going to aggravate problems unless we take special measures to ensure that these new projects serve the real needs of power sector.

We have been conveying the results of our analysis to the government. We also made a presentation to the Cabinet Sub-Committee about the results of our work. In addition, even before the Cabinet Sub-Committee was announced, we had made representation to the new state government urging it to take immediate action to limit the liabilities, if it

was planning to review the project. We had recommended urgent formation of a multi-disciplinary group to estimate the liabilities incurred and find avenues of limiting the liabilities till the government decision on this project was made.

The Power Purchase Agreement (PPA) Between Dabhol Power Company and Maharashtra State Electricity Board: *The Structure and its Techno-Economic Implications*

Girish Sant, Shantanu Dixit, Subodh Wagle

Introduction

In the debate over techno-economic aspects of the Enron controversy, at every stage, a barrage of new information, arguments, and allegations is being fired by both sides. To help resolve the ensuing confusion, an in-depth study of the original documents is mandatory. Among various documents, the power purchase agreement (PPA) is the heart of any independent power project (IPP). It guarantees market for power produced by the IPP and the tariff at which it would be sold to the purchaser. The PPA creates legal obligation on both the parties to perform the previously accepted tasks in a predetermined manner.

This paper presents an analysis of the PPA between Dabhol Power Company (DPC), the Enron subsidiary handling Dabhol project, and Maharashtra State Electricity Board (MSEB). The analysis is carried out in the techno-economic perspective and does not deal with issues like environmental and legal. The purpose of the analysis is to clarify the structure of the PPA and its techno-economic implications and to make an attempt to evolve a methodology to analyse such issues. Apart from the PPA, the analysis draws information from other publicly available documents and communications with MSEB. The first three sections in this paper elaborate various aspects of the structure of the PPA, while the later four sections deal with the important techno-economic implications.

Since, a lot has been written and talked about the DPC project, a certain level of knowledge of terms and issues is assumed. To limit length and reduce complexity of the paper, the paper is focused only on the first phase of the project with 695 MW capacity and using distillate oil as fuel.

1.0 Salient Facts About the PPA Between DPC and MSEB

This section describes some important facts about DPC and PPA in order to clarify some of the misconceptions:

The DPC plant is a build-own-operate (BOO) type of plant. The PPA between DPC and MSEB was signed on 8th December 1993 and was later amended on 2nd February 1995. The PPA assures DPC that MSEB will buy power from DPC for 20 years and make payments at the negotiated tariff. After expiry of the contract, MSEB has an option of buying the plant from DPC. The method of computing the cost is not fully spelt out in the PPA.

The PPA assures MSEB that DPC will construct this 695 MW (625 MW base and 70 MW peaking) plant in 33 months after the financial closure. The financial closure was effected on 1st March 1995. DPC assures 90% availability of the plant. For calculating tariff, a minimum efficiency of 44.9% for the base load plant and 28.1% for the peaking plant will be considered.

The cost of fuel will be passed on to MSEB. Enron Fuels International has been appointed as the fuel manager, and will be responsible for identifying the least cost fuel supplier. It will be paid \$ 2.5 million per year by MSEB, through DPC, for doing this. MSEB can exercise control on this process and DPC will need MSEB's approval for these purchase contracts.

All contracts during the construction period also need to be approved by MSEB. However, MSEB is allowed to object only if plant specifications are materially (from safety or economic point of view) harmful to its interests.

The PPA does not specify capital cost of the project. Change in capital cost (either decrease or increase) will not be passed on to MSEB. But change in costs due to change in customs duty and other taxes will be passed on to MSEB. The new Government of India (GOI) guidelines (which assure 16% return on equity etc.) are not applicable to the DPC project and in this case tariff is based on negotiated values agreed mutually by the DPC and the MSEB. Hence, the economic analysis of the PPA and comparison of DPC's expected profit with that of GOI guidelines become essential.

2.0 Analysis of DPC’s Performance Guarantees and Related Penalties.

One of the main planks of pro-Enron argument is a set of various performance guarantees from the DPC and the related penalties it has agreed to pay in case of default. As per the PPA, DPC will pay penalties for the late completion of plant, shortfall in capacity, and efficiency lower than the agreed value. Additional penalties are applicable in case the plant availability falls below 90%. This section lists and analyses these guarantees and related penalties. Table 1 shows the payment by DPC to MSEB and by DPC’s contractors to DPC in case of failure to give specified performance. It must be noted that the agreed parameters, when these penalties become applicable are different for DPC and it’s contractors.

The implications of these penalties are given in the next few sections.

Table 1: Penalties for DPC and Contractors for failure to meet agreed parameters.

Parameter	DPC pays MSEB	Contractors pay DPC
1) Delay in construction		
a) Upto six months	\$ 14,000/day	\$ 250,000/day
b) After six months	\$ 110,000/day	\$ 340,000/day
2) Shortfall in capacity	\$ 100/kW	\$ 1,892/kW

2.1 Guarantee Against Delay in Construction

DPC assures plant construction within 33 months. If the plant construction is delayed beyond 33 months, for first 6 months of delay, DPC will pay \$14,000 /day (Rs 0.64/kW/day) to MSEB. After first 6 months, the penalty will be increased to \$ 110,000 /day (Rs 5/kW/day). This is on the lower side of the range (Rs 5 to 7 /kW/day) prescribed by Vanguard Capital, the consultant to Government of India (GOI) (Vanguard Capital, 1994). On the other hand, as per the construction contract signed by DPC with Bechtel and General Electric (called contractor), DPC will receive much larger penalties from the contractor. The contractor assures construction in 33 months, and for the delay up to 6 months, contractor will pay \$250,000 /day to DPC and there after \$340,000 /day (IDBI, 1994). In effect, DPC will retain nearly, \$230,000 per day after paying penalty to MSEB. This sum, of \$230,000 is sufficient for DPC to meet the daily interest payment on all debt and

allows an additional margin of Rs. 13 lakh per day for other expenditures. In effect, in case of delay, DPC pays nothing from its pocket, neither as interest on loans nor as the much talked about penalties to MSEB. Contractor's willingness to assure such heavy penalties to DPC also indicates that guarantee for constructing such plant in 33 months does not involve a big risk.

2.2 Guarantee Against Shortfall in Capacity

Between DPC and MSEB, the plant will be considered commissioned only if it can operate at a minimum of 80% of the nominal capacity (i.e. 80% of 695 MW = 556 MW). In case, the commissioned capacity is more than 80% of nominal capacity but less than the nominal capacity (695 MW), DPC is allowed to make rectifications in the plant, within 12 months, to raise the capacity up to 695 MW. If it fails to do so even after 12 months, DPC pays \$ 100 /kW of capacity shortfall. This is nearly half of the penalty amount (\$ 185 to 200 /kW) prescribed by Vanguard Capital in such cases.

As per the PPA (Schedule 1), the capacity being built at Dabhol is not 695 MW but 725 MW (4.4% more than 695). DPC will not accept the plant from its contractor if the capacity is below 695 MW. And the penalties for delayed construction (described above) will apply to the contractor. If plant can produce between 696 MW and 725 MW, DPC will accept the plant, but the contractor will be expected to make modifications in the plant to raise capacity to 725 MW. In this period, DPC will receive Rs 28 /kW/day for the short-fall below 725 MW.

If the contractor fails to deliver 725 MW, DPC gets \$ 1,892 per kW of capacity shortage. It can be recalled that DPC pays only \$100 per kW as penalty to MSEB (for shortfall below 695 MW). In effect, DPC earns Rs 6 crore per MW of the shortfall (below 725) but pays MSEB only Rs 0.32 crore/MW of shortfall below 695.

If, for example, the final capacity is only 700 MW, then DPC will receive \$ 21,860 per day from the contractor and, further, in case of failure of the contractor to upgrade capacity to 725 MW, DPC will also receive \$ 47.3 million. However, DPC will not pay anything to MSEB on this account. Rather DPC has an option of selling this additional 5 MW to MSEB as described later. In such cases, DPC make profits and not losses!

2.3 Guarantee for Heat Rate

The GE (General Electric) equipment is said to be very efficient (ET, March 23, 95). The GE guarantees DPC a maximum heat rate of 7,460 Btu/kWh¹, called Guaranteed HR, i.e. an efficiency of 45.7%. If the heat rate is more, the contractor will pay DPC \$ 121,000 per Btu/kWh of the increase. However, DPC, in turn, promises MSEB a heat rate of 7605 - 145 Btu/kWh higher than what GE has promised. If the heat rate is lower than 7605, then DPC gets a bonus for this. On the other hand, if the heat rate increases beyond 7605, DPC will absorb the incremental fuel cost. But gets a handsome compensation from the contractor. Thus, by guaranteeing a lower value of HR, DPC assures itself a bonus for its normally expected performance.

DPC may argue that over the years with continuous usage, the plant efficiency drops and the heat rate increases and, hence, DPC's assured maximum heat rate of 7605 for the contract period of 20 years is a reasonable offer. However, if a sharp rise in the heat rate is expected, DPC could have assured an increasing heat rate over the project period instead of the flat one it has assured now.

2.4 Assured Plant Availability

If the plant availability is below 90%, DPC will give a rebate to MSEB. For availability in the range of 86 to 90%, the capacity payments will decrease proportionally. In other words for each percent point decrease, the yearly capacity charges reduce by \$ 2.2 million. But if availability is even lower than 86%, the decrease in capacity charge will be at double that rate, i.e. \$ 4.4 million per year per percent decrease.

But an availability of 90% for gas turbines is an international norm and not something extraordinary. In addition, according to the DPC's arguments, its actual installed capacity being higher than 695 MW (725 MW), the effective availability it is promising on 725 MW is much lower than 90%, which could be easily achieved. (IDBI, 1994)

To sum up, the said commendable performance being assured by DPC needs to be viewed critically because: (a) In many cases, DPC assures a performance (plant capacity and efficiency for example) that is

¹ The heat rates are based on higher heating values and are defined for exportable energy. The heat rate is defined as the fuel required to produce one kWh of electricity therefore higher the heat rate, lower the efficiency.

lower than what is achievable in the worst case. Thus, even if plant performs as expected, DPC automatically gets a bonus for “good” performance; (b) Further, the so-called “stiff penalties” that DPC is said to have promised to MSEB are negligible compared to those it is getting from its contractor. Thus, DPC has thoroughly sheltered itself from any risk burden. Rather, it has manoeuvred itself in such an enviable position that, in many cases, it stands to gain even if it fails to attain the performance standards.

3.0 Tariff Structure

The price of electricity from DPC is often quoted as Rs 2.4 /kWh. Many attempts have been made to compare this price with that of all other projects across the board. Before going into such comparisons, we need to understand that DPC tariff is not one fixed number. Rather, it is highly sensitive to many factors, and is expected to increase at a steep rate in future. For most power projects of SEBs in India, the tariff usually decreases or increases marginally with passage of time (due to increase in fuel and O&M costs) . To understand this crucial difference and its implications, it is essential to carry out a detailed analysis of the two-part tariff structure in the PPA comprising capacity and energy charges.

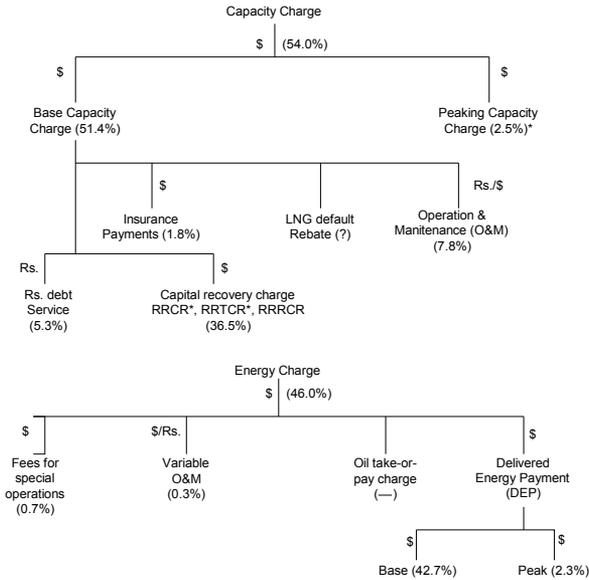
This tariff structure described in PPA is depicted in a simpler form in figure 1. The numbers in parentheses indicate the share of that component in the total tariff for the base case defined later.

3.1 Capacity charge

3.1.1 Components of Capacity Charge

Capacity charge, the first component of the tariff, can be understood to be similar to ‘rent’. It is applicable in full, if plant availability (for generation) of 90% is achieved. However, it should be noted that, it is in no way related to the PLF (which is a measure of the extent to which the plant actually produces electricity).

Figure 1: Structure of DPC tariff



Note : The values in parentheses indicate the share of that component in total payment of Rs. 1299 crore in 1997. This calculation for base case defined in the text assumes 90% PLF of base capacity (625 MW) and 27% PLF of peaking capacity (70 MW)

- \$ and Rs. symbols indicate the predominant currency in which payment will be denominated

- * indicates a 4 % back loading (an increase of 4 % p.a.)

Capacity charge includes various fixed charges such as: (i) Capital repayment (denominated in \$ and Rs.): This single largest component of capacity charge, includes debt service and return on equity. The debt service of loan in Rupees is separately identified, while the rest of capital repayment is in dollar. The dollar component of capital repayment is back loaded by 4% (increases 4% p.a.); (ii) Fixed operation and maintenance (O&M) charge (in \$ and Rs); (iii) Insurance fees (in \$): The insurance and O&M payments are indexed to the inflation (US or Indian inflation, as per the denominated currency); and (iv) An undefined quantity of rebate applicable in case of default by LNG (liquefied natural gas) supplier. The LNG default rebate is defined for sharing risk of LNG unavailability, but it was undecided (up till February, 95) when PPA was amended.

3.1.2 Basis for Capacity Charge Calculations

Capacity charge is defined in terms of a combination of Rs. and \$ /kW/hr. The 'kW' refers to the kw of 'Rated Plant Capacity', and the 'hr' are 8760 in a year irrespective of the PLF. The capacity rating is done yearly through a capacity test. Provisions for revising the value of 'Rated Plant Capacity' are specified in the PPA: (i) In case of frequent and serious forced outages, the rated capacity is to be revised through repeated capacity tests; and (ii) The Rated Capacity could be revised voluntarily by DPC, in case of DPC's failure to make full Rated Capacity available for generation for 6 consecutive months, and if DPC sees no chances of improvement in next six months.

The capacity charges will be calculated hourly and paid in monthly instalments. If plant capacity exceeds 695 MW (as expected), MSEB has option, at the beginning of each year, to either buy or reject that extra capacity. If MSEB rejects it for the year, this additional capacity will not be available to MSEB during the year even in case of a dire need. If MSEB decides to buy this additional capacity, MSEB will make corresponding additional capacity payments to DPC. An important point to be noted is that the additional capacity carries same charge as that of the first 695 MW. In fact, this should have been substantially lower, as DPC is installing this additional capacity in the said capital cost of 2912 crore and will not be spending anything more for this purpose.

If the DPC plant runs as expected, the added 9 MW base and 20 MW peaking capacity will fetch DPC an additional revenue of nearly \$ 5.8 million /yr. (which would provide an additional 2% return on equity).

Power plant capacity derates as time passes, but the possibility of derating by more than 5% is small. And as in the case of heat rate, this could have been accommodated simply by DPC assuring only 695 MW but offering additional capacity, if available, at a nominal charge.

3.1.3 *Adjustments to Capacity charges*

3.1.3.1 *Adjustments Due To the External Factors*

The major chunk of DPC's profit accrues from capacity charges. These charges are adjusted for a host of variables, such as, (i) possibility of customs and sales tax exemption, (ii) change in corporate tax (income tax), (iii) \$/Rs rate fluctuations, (iv) change in government regulation / law regarding maintaining dividend reserve, (v) any other change in law/regulation that would alter DPC's costs or require DPC to alter its business practices. The charges are adjusted (presumably) to maintain DPC's profits in case of a change in above variables. Some important implications of these adjustments are as follows:

If DPC was granted customs and sales tax exemptions, the capital repayment charge would have reduced by 14.23%. In 1997, this reduction would have been \$ 23.9 million. Due to decrease in corporate tax from 57.5% to 46%, the tariff has declined. This decline will materialise only after the 8th year.

While signing PPA, the terms of IDBI loan to DPC were not decided. The calculations assumed interest on Indian loan at 20% p.a. In case the interest rate is actually lower, it would save money, as is the case (IDBI interest rate on DPC loan is 17.5%). This saving is not being passed on to MSEB, but is taken off by DPC and that too in dollars (implying a protection against exchange rate). With the result, that lower the IDBI interest rate, more is the direct profit to DPC.

Ten and half years after commissioning of phase I, the 4% yearly increase in the capital repayment will cease, if GOI does not require DPC to maintain a 'dividend reserve' for paying dividends (i.e. if GOI does not block DPC's money in banks). The capital repayment charge will then start declining at 0.42% p.a. Communication from MSEB indicates that MSEB assumes that such reduction in tariff will be applicable (MSEB, 1995).

But, it is not clear whether the GOI exempted DPC from this reserve or DPC unilaterally decided to provide this concession. This rebate has been considered in our calculations to arrive at the 'conservative' estimate.

3.1.3.2 Availability/Performance Related Adjustments

Before going into the availability rebate and bonus, we need to understand how availability is defined. DPC makes an hourly declaration of available capacity. This 'Declared Capacity' is considered to be actually available (available capacity, AC) unless DPC fails to meet MSEB's hourly supply instructions (called dispatch instructions). If DPC can supply 95% or more than 95% of MSEB's instructions, the generation level achieved is considered to be the 'Available Capacity' (AC). But when supply is below 95%, DPC has to prove that such a shortfall occurred despite its best efforts and was unaware that such situation could occur. If DPC fails to prove this, it is considered as 'False Declaration', and the penalty is to reduce the AC achieved in past few days.

The 'Average Availability' in any period is the ratio of average AC to the rated capacity. In effect, the 'False Declaration' or a supply lower than MSEB's instruction can lead to decreased availability. And if this results in availability lower than the assured, DPC pays a penalty. If this average availability falls below the target value (i.e. 86 and 92% for monsoon and rest of the year respectively), capacity charges are reduced. The amount of reduction is already discussed in section 2.4.

In the PPA, there is provision for bonus for higher hourly capacity utilisation. The GOI guidelines do not allow such bonus. The DPC-MSEB agreement does not follow GOI guidelines. Bonus is defined for peak hours (16 hours) in the peaking season (8 months). This bonus is for hourly 'capacity utilisation' in excess of target availability (TA) and is defined by a complex equation. The maximum value of this expression, with present clauses, can be 0.2 to 0.5% of the yearly capacity charges. So, the purpose of such a complex equation is unclear.

3.2 Energy Payments

The second component of the two part tariff is the sum of energy charges. This represents the variable charges and is nearly proportional to the PLF. It consist of: (i) Payment for fuel consumed (or deemed to have been consumed) called 'delivered energy payments' (DEP); (ii) Variable O&M charge; (iii) Take-or-pay charges for fuel supplies; and (iv) Special operation fees.

The first part, DEP, is the largest (about 97%) of the energy payments, and is later dealt in detail. The variable O&M charges, which are small, are specified separately in \$/kWh and in Rs/kWh, and are

indexed to US and Indian inflations respectively. If the fuel purchase agreement between DPC and the fuel supplier is of 'Take-or-Pay' nature and if MSEB does not operate the power plant for sufficient duration so as to consume the 'Minimum Take' quantity of fuel, then the charges to be paid to the fuel supplier will be reimbursed by MSEB. MSEB would approve the fuel purchase agreement. Whether the fuel purchase agreement has been signed and if so, what are its terms is not clear as yet.

3.2.1 *Delivered Energy Payments*

The delivered energy payment (DEP), i.e. the fuel charge, is separately accounted for the base and peaking capacity. The duration of operation of base and peaking plant are, in turn, decided by MSEB's dispatch instructions.

3.2.1.1 *Delivered Energy Payments for Peaking Energy*

For the peaking plant of 70 MW, a fixed heat rate of 12,150 Btu/kWh (i.e. 28.1% efficiency) has been agreed. Fuel consumed for peaking operation is simply calculated by multiplying this fixed heat rate with the net energy delivered by the peaking plant. This fuel consumption together with price of fuel gives the DEP_{peak}:

DEP_{peak} = Price of fuel x fuel consumed.

3.2.1.2 *Delivered Energy Payments for Base Load Plant*

For 625 MW base load capacity, a maximum heat rate of 7605 (minimum efficiency of 44.9%) will be considered for the payments to DPC. The expected heat rate is lower as described in section 2.3. After commissioning, heat rate will be tested (TestHR). The heat rate used for calculating fuel consumed, or deemed to have been consumed is called ContractHR and is estimated as follows:

ContractHR = 7605 - max [1.03x(3/4)x(GuaranteedHR - TestHR), 0]

where, GuaranteedHR is the heat rate guaranteed by contractors to DPC (7243 Btu/kWh-gross).

This implies that, DPC assures a maximum HR of 7605, but if the operating HR is lower, DPC will not pass the full benefit to MSEB. The 25% of the difference will be passed on to DPC as bonus. In the normal operating situation (GuaranteedHR=TestHR), DPC will get a benefit equivalent to 144 Btu/kWh of base generation. At oil price of \$4.63/Btu, this will be Rs. 0.0216/kWh. At 90% PLF, this is nearly \$ 3.3 million per year (equivalent to return on equity of 1.24%).

The GE turbines (frame 9FA), that are being used by the DPC, are said to have a 4% higher efficiency than the smaller turbines manufactured by BHEL (frame 9E). However, the savings achieved due to this higher efficiency are taken away by DPC without even acknowledging it as 'bonus'.

Adjustments to Contract Heat Rate : If the operating efficiency of the base load plant changes, DPC can intimate MSEB and the Contract HR will be recalculated through an efficiency test. The Contract HR discussed above, is defined for the full load operation at the system frequency of 50 hz. As operating conditions change from time to time, the Contract HR will be adjusted for load and frequency. This adjusted heat rate will be higher, and will be calculated on an hourly basis. This will be used for payment calculations.

3.2.2 Special Operation Fees

In addition to the above charges, MSEB pays fees to DPC for some special operations. The special operation fees include: (i) Fuel management fee of \$ 2.5 million per year, increasing at the US rate of inflation. This fee was widely criticised on the grounds that obtaining fuel is part of the plant operation and, hence, should be covered in O&M charges. (ii) Fees in case MSEB unnecessarily undertakes the capacity test. If DPC proves that capacity test was not needed MSEB pays \$ 50,000 (iii) Fees for hot and cold starts.

3.2.3 Relation between Hot and Cold Start Fee And PLF

The PPA allows MSEB to shut off one of the two gas turbines of DPC plant. This can reduce plant output by a half. Restarting this GT implies a hot or a cold start (depending on the duration of shut down). The hot start fees (applicable for shutdown of less than 12 hours) are \$ 10,429 for 9FA GT and \$ 5,015 for steam turbine. Such starts would become regular features, if MSEB uses DPC plant as an intermediate load plant in order to make optimum usage of its own cheap coal plants. In this case, hot and cold start fees would be as much as \$ 3 million per year, with some addition to DPC profits. Closing the GT can reduce plant output by half (i.e. by 312.5 MW) making the cost of reducing output equal to Rs 1.07/kW. This cost can be justified only if MSEB saves more than these fees by running its cheaper coal plants. Considering (fuel) cost of coal at Rs. 0.7 /kWh in 1997, and that of DPC at Rs 1.01/kWh, savings will only start accruing if the 9FA turbine is closed for more than 3.5 hours. For medium load operation, closing down one GT should be

possible for 9 to 10 hours. In such a case, savings for first 3.5 hours are used up for paying hot start fees, in effect DPC eats away 35 to 45% of the MSEB savings. Thus, even though technically MSEB is allowed to partially back-down the DPC plant, these fees act as a major barrier.

4.0 The Price of Electricity From DPC

The DPC tariff is primarily dependent on three factors: the Rs/\$ exchange rate, oil price, and plant load factor (PLF). The change in corporate tax rate, exemption of customs and sales tax and exemption to DPC from maintaining dividend reserve will also affect tariff in a significant way. But, the Indian and US inflation have little direct effect on the tariff.

4.1 Base Case Definition

The most talked about case of 90% PLF, with some additional assumptions, is defined here as the base case. The assumptions are:

- i) Inflation rate of 8% p.a. in India and 4% p.a. in USA.
- ii) No change in Real oil price. In the last few years, international oil prices have dropped (in real \$). But for long term planning, the major international utility planning manuals assume a significant increase in oil prices (increase at 2 to 4% p.a. in real \$).
- iii) Rs depreciate at 4% p.a. in relation to the US \$. Historically Rs has depreciated at a minimum rate of 4.5% p.a. and a maximum of more than 8% p.a.
- iv) 90% PLF for base capacity and 27% for peaking capacity,
- v) The dividend reserve rebate is applicable from the 11th year, i.e. the capital recovery charges decrease at the rate of 0.42% p.a.

4.2 Estimate of DPC Tariff and Its Components

The DPC tariff is applicable at the door of DPC. MSEB is responsible for transmitting and distributing this power, and will bear the associated costs and losses. For the base case, this tariff in 1997 will be Rs.2.5/kWh, implying a total payment of Rs 1,240 crore (\$ 387 million) in 1997. Figure 2 shows total yearly payments by MSEB to DPC for base case scenario and if the oil price (real) decreases at 2% p.a. About 5% of this payment is in Rupees and rest in Dollar terms. The contribution to total tariff from various components is shown in figure 1.

For calculating MSEB's effective cost for supplying DPC's power to average consumer, we need to consider T&D cost, T&D losses, and other expenses incurred by MSEB. T&D losses of 10% is assumed. As a conservative estimate, the total downstream costs of T&D network strengthening, metering, billing etc. is considered at 60 paisa/kWh, (constant for 20 years). The electricity duty levied by Government of Maharashtra (GOM) is expected to be around 25 paisa/kWh in 1997 which is assumed to increase with Indian inflation. Hence, in 1997, the total cost to MSEB for supplying DPC's power to the average consumer would be about Rs 3.57/kWh.

4.3 Sensitivity to PLF and \$/Rs. Exchange Rate

In general, the combined cycle gas turbines (CCGT) are not economical for base load operation as their fuel cost (oil in this case) is far more than that of coal plants. This is also true in the case of the DPC's plant. It is estimated that, barring a transitional period of the next few years, it will be economical for MSEB to use DPC's base capacity at a PLF of 65 to 70%. The peaking plant, of 70 MW, is likely to be used at 27% PLF. The most likely scenario, a PLF of 70% for base and 27% for peaking plant, is taken here as the second case for sensitivity analysis.

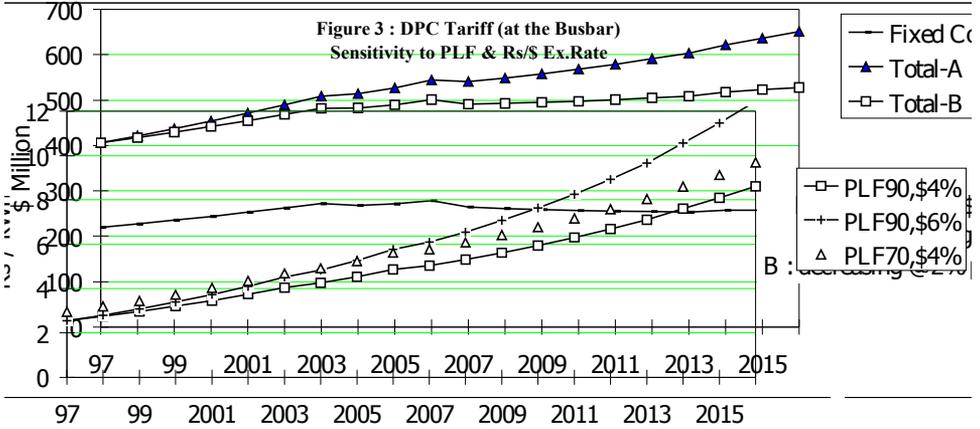
Figure 3 shows yearly tariff at DPC busbar for base case (called 90- busbar) and for the second case (called 70-busbar).

It is assumed that the Rs would depreciate at 4% p.a. relative to the US \$. If the exchange rate variation is different from this, it will directly affect the tariff as more than 95% of the tariff is denominated in dollars.

4.4 Representative Price of Electricity From DPC

As mentioned earlier, usually the cost of electricity from power plants does not increase throughout its economic life, (except for changes in

Figure 2 - Annual Payments by MSEB : Sensitivity to Oil price



fuel price) as it does in the case of DPC. The capacity charge in the DPC tariff has an in-built increase of 4% p.a. Hence, it is inappropriate to directly compare the said DPC tariff of Rs 2.4 /kWh, in 1997 with the cost of generation from other projects. Only the tariff over the full life-time of the project can be compared. This life-time (levelised) tariff, for DPC plant is Rs.4.18/kWh, for 70% PLF scenario². This is the most representative price of electricity from DPC, and can be used for comparison. For the base case, this levelised tariff is Rs 3.63/kWh. This tariff is later compared to that of alternative plants.

Table 2 indicates the sensitivity of tariff to the major variables. The values indicate the levelised tariff in nominal Rs. Assumptions are same as those of the base case.

² Throughout the analysis the levelised costs and the net present values are calculated using a discount rate of 12% p.a.; i.e. nominal discount rate of 17% for US dollar streams and 21% for Rupee streams.

Table 2: Tariff Sensitivity to Oil price, Rs/\$ rate and PLF

	90% PLF	70% PLF
\$ 4%, Oil -2%	3.44	3.99
\$ 4%, Oil 0%	3.63*	4.18
\$ 6%, Oil 0%	4.06	4.68

Note : \$ 4% = \$ appreciate w.r.t. Rs @ 4% p.a.
 Oil 0% = Real oil price increase is 0% p.a. etc.
 * = base case scenario.

5.0 Estimating Profitability of DPC

In this section, DPC's profitability is estimated for the base case specified earlier. The financial assumptions used are specified in the Annexure. DPC's profitability is calculated by deducting the DPC's payments from its revenue as defined below.

Major income for DPC comes from : (i) capital repayment charges (RRCC), Rupee debt repayment (RCR), indirect bonus for heat rate lower than heat rate assured by DPC to MSEB. While the DPC's payments are: (i) debt repayments and (ii) applicable corporate tax.

Figure 4 shows the debt repayment and applicable tax (superimposed on the debt repayment). Difference between these values (which is shaded) shows DPC profits. For a better picture of DPC's profitability, the yearly changing profits are converted to a stream of constant profits (levelised profits). This profit is equivalent to little over 40% of 'return on equity' (as defined by GOI). If the GOI guidelines were adopted DPC would have been allowed to receive a maximum of 31% return on equity.

5.1 IRR Estimation

DPC's profitability in terms of internal rate of return (real, post tax IRR in \$) is estimated to be around 28%. This IRR does not include possible hidden profits to DPC such as: (i) through sale of additional capacity to MSEB, (as much as 2% on the equity), (ii) construction profits, as obtained by ENRON in Teesside plant, UK (Enron, 1992) (iii) through use of plant infrastructure for other commercial activities, (iv) Availability bonus, etc.

A report by Vanguard Capital submitted to the GOI says that, after considering the perceived high business risk in India, foreign

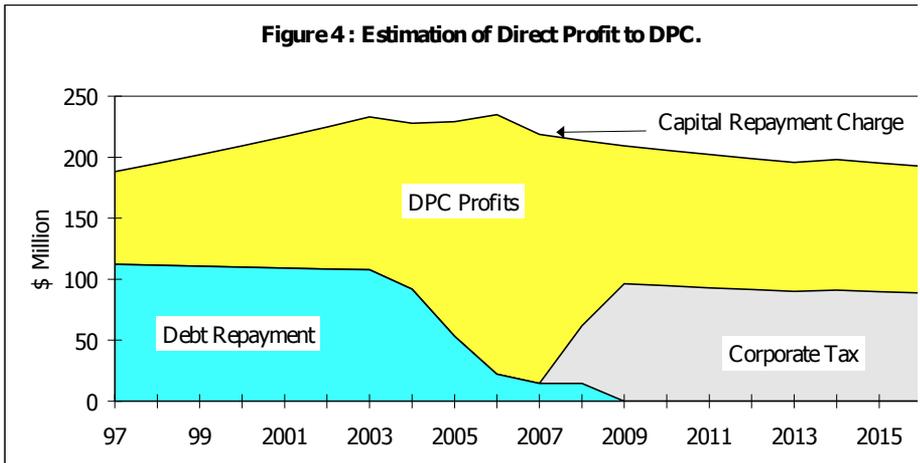
investors would expect an IRR of about 17 to 21% (post tax, real \$). This IRR assumes no hidden benefits. Using this estimate (IRR of 19%), MSEB will be paying \$ 200 million extra to DPC over the 20 year period (1996 NPV).

6.0 Whether DPC Project Makes Economic Sense for MSEB

Usually, in India, cost of generation from a new power plant is higher than the existing average tariff. The average tariff reflects the historical average cost of generation. The difference between this average cost of generation from all plants and the higher cost of new plant can be considered as the loss to the SEB owing to this new plant. Usually, the cost of generation from any plant does not increase rapidly. But the average tariff, keeps increasing due to addition of new plants, increasing T&D costs etc. Hence, SEBs make losses in the initial years of operation of a power plant. But, with passage of time, the losses decrease and eventually SEBs start making profits from selling power from the said plant.

In this light, MSEB should take up any project only if MSEB expects profit in the life-time of the project. The same logic should have been applied in the case of the DPC proposal. As expected, in this case too MSEB would make huge losses by selling DPC power in the initial 7 to 8 years. Later, if MSEB's tariffs increase adequately, MSEB would start making profits through the sale of DPC power. The concept of net-present-value (NPV), is used to define profitability.

As mentioned earlier, unlike most projects, the DPC tariff is



expected to increase rapidly with time. For the base case scenario defined earlier, DPC tariff increases from Rs 2.55/kWh in 1997 to Rs. 8.6 /kWh in 2016. The effective cost of DPC power by the time it reaches the average consumer, would be Rs. 3.6 /kWh and Rs. 11/ kWh for the respective years (a levelised cost of Rs. 4.88/kWh) for the base scenario.

The average tariff of MSEB is expected to be around Rs 2.2/kWh in 1997. Based on this, an estimate could be made of the rate at which MSEB tariff should be increased so that MSEB makes a net profit (a positive NPV) on account of DPC in the lifetime of the project.

For the base-case scenario, it has been estimated that, MSEB can make profits from DPC plant only if it's average tariff increases at a rate higher than 15.5% p.a. (This can be compared to the average tariff increase of MSEB, in last decade, of about 12% p.a.). Hence, DPC project makes economic sense to MSEB only if the average tariff increase is more than 15.5% p.a. for the next two decades. This would

result in a tariff of over Rs. 30/kWh in 2016 (an increase of 7.1% p.a. in real terms, and a tariff in 2016 of Rs 8.1/kWh in the constant 1997 Rs.). Even in most favourable case of Rs. depreciation by 2% p.a. and real oil price decrease by 2% p.a. MSEB tariff will have to be increased by over 6% p.a. (real). In this case the tariff by 2016 will be Rs. 6.6/KWh (1997 Rs.) If the increase in tariff is not so sharp, DPC project will result in net losses to the MSEB.

In the likely case (of 70% PLF, no real increase in oil price), MSEB can make profit on DPC project only if MSEB’s tariff increases at a rate of 17.25% p.a.!

7.0 How Much in Excess are We Paying

The LNG/oil fired base load plant is not an economical option for the power sector. In fact, the Least cost plan for the state of Maharashtra indicates very substantial savings if we adopt options different from such plants (Sant, Dixit 1994). But for the time being, it is assumed that projects such as DPC are inevitable. This section quantifies the excess payment by MSEB on account of DPC’s high capital cost and high profitability.

- 1) Some experts have argued that a plant similar to that of DPC (inclusive of the infrastructure costs) can be built with much lesser capital. The figures of Rs. 3 to 3.75 crore per MW are claimed and supported by these experts against the estimated capital cost of 4.19 crore /MW of the DPC project.
- 2) An IRR of 19% is considered as reasonable against the estimated IRR of DPC is over 28% (post tax, real, in US \$).

Table 3 shows the excess payments by MSEB, if reduction in capital cost and the IRR is achieved. This is expressed in two ways: (a) the yearly saving in crore Rs. (the levelised savings). This can be compared to the levelised capacity payment of Rs. 950 crore to DPC. and (b) in terms of one time saving (1996 NPV). This can be compared to the capital cost of the project, around Rs 2910 crore.

Table 3: Excess payments by MSEB

Capital cost (Rs. Crore/MW)	3.0	3.75
Yearly excess payment (Rs. Cr./Yr.)	290	225
One-time excess payment (Rs. Cr.)	1,350	1,050

Note: The reduction in corporate tax for the alternate plant, as compared to that of DPC is ignored.

The levelised tariff for the alternative plant (capital cost of Rs 3.75/MW, and IRR of 19%) is compared with the levelised tariff of DPC, for two assumptions. The values below are in nominal Rs.

Table 4: Comparison of the Levelised Tariff of DPC and the Alternative Plant.

	DPC	Alternative 3.75 Cr./MW	Plant 3 Cr./MW
Base Case PLF 90%	3.63	3.19	3.0
Second Case PLF 70%	4.18	3.62	3.45

Conclusion

This paper demonstrates following important results:

- (i) Various performance guarantees from DPC and related penalties it has assured do not constitute any substantial burden on the DPC. On the contrary, DPC would receive bonuses even for its ordinarily expected performance.
- (ii) The levelized tariff for DPC's electricity varies from Rs. 3.44 / kWh to Rs. 4.68 / kWh depending upon the changes in oil prices, PLF, and Rs./\$ exchange rate.
- (iii) DPC's profitability (estimated at a real, post tax, IRR of 28%) is quite high compared to that prescribed by GOI consultants (17% to 21%).
- (iv) MSEB ends up paying about Rs. 225 crore extra each year if the effects of higher capital cost and higher profitability are considered.
- (v) The DPC project would be viable for MSEB only if MSEB's average tariff keeps increasing at a rate more than 15.5% p.a. for the next two decades. This tariff rise is more than that of the last decade.

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Annexure

Financial assumptions for DPC profitability estimation :

It has been assumed that 5% of DPC equity is brought in the initial year and loan equivalent to 95% of equity (with 12% interest in US \$) is brought in the next year. This loan is later replaced by real equity before commissioning.

The financing package of DPC has been assumed as follows; the interest indicated is the effective interest rate, and the term indicates repayment period after construction.

	Million \$	Interest % (p.a.)	Term (Yr.)
Total Cost	910.0	—	—
Equity Capital	266.2	—	—
Indian Loan	95.6	17.5%	9.5
US Exim Loan	298.2	8.4%	8.5
OPIC	100.0	10.0%	12.0
Other \$ loans	150.0	11.0%	7.5

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The Enron Deal: Why the First Phase Should be Cancelled

Subodh Wagle, Girish Sant, Shantanu Dixit

The debate on the Enron project has now reached a decisive stage. This is reflected in the article by Dr. Kirit Parikh (Director, Indira Gandhi Institute of Development Research) published in the Times of India (dt. 28/4/1995). Despite being the head of a quasi-governmental institution, Dr. Parikh was pioneer in criticising the Enron deal and endured heavy counter-criticism in the process. In this context, his above-mentioned article acquires a special significance as he seems to be singing to a different tune therein. Though the article carries the sub-title “Renegotiating the Second Phase”, the theme of almost the entire article could be summed up as “Going Ahead With the First Phase”. Dr. Parikh is, certainly, not alone in advocating this, but this article might become the mainstay of the argument of Enron supporters in the next phase of this debate. Here is an attempt to point out some serious problems in his calculations that demands reworking of the entire argument.

Dr. Parikh’s Argument

To start with, let us understand Dr. Parikh’s methodology and argument. In essence, he calculates: (a) excess payments to Enron over the entire project period (20 years), and (b) loss to economy (if the deal were cancelled) in a two year period before an alternative project can be commissioned. He claims that the loss to economy is somewhat on the higher side, and, hence, arrives at the conclusion that even without considering non-quantifiable losses, like the loss of credibility in the international market, cancelling the first phase at this stage makes “little economic sense”.

With the numbers he has presented, this inference seems quite puzzling. The total cost of Enron’s Dabhol project is nearly Rs. 3,000 crore. Dr. Parikh estimates that the excess payments to Enron (at the present discounted value, NPV) amount to Rs. 1,800 to 2,700 Crore and, still, he argues that a delay of even two years (till another equivalent

project comes up) would wipe out all the savings achieved by avoiding these excess payments. Let us look into his numbers in some detail.

Before presenting the results of his calculations of excess payments to Enron, Dr. Parikh lists a series of objections and questions that have been raised in this controversy. After considering these objections, he arrives at what according to him is the “bottom-line of the Enron deal”. This comprises of two important elements: (a) capital cost of the plant which according to him is inflated by 20% and (b) guarantee of 86% load factor. Dr. Parikh estimates effect of these two factors and arrives at the figure of Rs. 180 to 270 Crore as yearly extra payments.

Missing Elements

However, if we look into the list of objections he has dismissed, two elements seem to be too crucial to neglect. First element is the internal rate of return (IRR) for Enron, an indicator of the profitability. Dr. Parikh accepts that the IRR is 30% on “claimed equity”, but he finds this value of IRR as “reasonable.” First of all, if he agrees that the capital cost is inflated by 20%, the effective IRR on “real equity” will be much higher and he should take this value of IRR into consideration. Nevertheless, according to the recommendations of Vanguard Capital, an international firm appointed by Government of India as consultants, IRR value of 17-21% (post tax, real and with no hidden benefits) would be sufficient for attracting foreign capital in India even after accounting for the high risks perceived by these foreign investors. An IRR value should be even lower in case of Enron deal, because, as our analysis of PPA indicates, most risks in the project are borne by MSEB and this is virtually a no-risk proposition for Enron. Our analysis also shows that ENRON gets a real, post tax IRR between 26% to 32% on “claimed equity” (depending on when equity is brought in). Our preliminary estimates indicate that this would add another Rs. 70 to 90 crore annually to the excess payments to Enron.

The second element neglected by Dr. Parikh is that of various other indirect benefits and inflated payments to Enron including: bonuses for higher capacity utilisation and higher efficiency, high O&M costs, payments for hot and cold starts etc. These would increase Enron’s returns by another 5% requiring an upward revision of Dr Parikh’s estimate of excess payments of nearly Rs 50 crore per year. For example, one important rationale for inviting Enron is that it has proposed to employ technologically sophisticated GE turbines (54%) as against the

BHEL turbines(49%). However, according to PPA Enron will automatically get extra bonuses for efficiency beyond 47%.

Coming to the results of Dr. Parikh's calculations of "loss to Indian economy" if the Enron deal were cancelled, he has included two major factors in this calculation: (a) a penalty to Enron which he estimates as Rs. 300 Crore; and (b) "opportunity cost of the unmet demand". The third aspect he included but found unquantifiable is "loss to India's credibility". Regarding the first factor, thorough investigations are needed to ascertain the amount of penalty MSEB will have to pay as there is vast difference between the two estimates quoted by Dr. Parikh (60 Crore and 300 Crore).

While calculating the second factor, "opportunity cost of unmet demand", one needs to be more cautious as it seems to be turning the balance decisively in favour of Dr. Parikh's inference. It is not clear whether Dr. Parikh's calculations have taken cognisance of following elements: First, it seems that his assumption is that even in first two years the "unmet demand" will be equivalent to the entire capacity of the first phase (695 MW). This convenient but questionable assumption substantially inflates the estimate of the 'lost generation' and, hence, that of loss to the economy. Secondly, it has been the experience in the past that if there is small shortfall in the power, the agricultural and domestic (rural) sectors bear the brunt and not the industry. Hence, it seems inappropriate to apply Rs.5/kWh as the opportunity cost indiscriminately to the entire quantity of 'lost generation'.

When he calculates the magnitude of economy-wide effects of "unmet demand" if the Enron deal were cancelled, Dr. Parikh needs to include all the economy-wide benefits that may accrue if we send back the consortium of Enron, GE, and Bechtel who boast that they are bringing everything from the USA except local labour and construction material. Just, as an example, consider the economy-wide benefits, that would accrue if the construction contracts worth Rs 1823 Crore were awarded to BHEL and other Indian companies. A multiplier effect of around 3 to 5 is talked about by economists, implying a gain to the economy of over Rs. 5,000 crore if we cancel the Enron deal.

Thus, there is hardly any net "loss to economy" if the Enron deal were cancelled, whereas there are "excess payments" to Enron involving large amounts if the present deal of the first phase is accepted. Hence, we strongly feel that there is not even an "economic justification" for continuation of the first phase of the Enron deal.

International Credibility

This brings us to the third factor: “costs of loss in credibility and consequent disruption in the flow of foreign investment into the country.” We are indeed happy that Dr. Parikh found it unquantifiable. This oft-raised bogey of the international stigma needs to be demystified urgently. It is quite clear that Enron tried to pull off quite an unfair bargain, to say the least. The international business community is (and if not, it better be) mature enough to understand difference between a fair business deal and outright plunder. Further, at least in the energy sector, we are in a buyer’s market and hence, a country like India which is a giant consumer need not worry much about the so-called international back-lash. If we look at how various MNCs, despite their earlier experiences, are trying hard to get more business in countries like China, Iran, and Iraq, we can be sure that there will be plenty of companies eager to come if we offer them a fair deal.

Rather, considering the size, economic robustness, and scientific and technological capacity India possesses, we want to argue that it is the obligation of a country like India to send the “right signals” to the international business community. The community needs to be told in clear terms that economies of developing countries are not up for the grab. This obligation carries an appropriate reward, especially, if we ourselves opt for cheaper technology from the third world (for example our own BHEL technology). This could also equip other developing countries to negotiate and demand for cheaper technology from the third world.

Finally, thanks to the much slighted democratic system in this country, the politicians and bureaucracy have to consider another aspect of this deal which elite experts and media can easily afford to forget. While worrying about the “international credibility”, the elected politicians also have to give equal, if not more, priority to their “internal credibility” which these experts and the media often tend to dismiss as “populist pressures”.

\$100 Million Question

Now let us try to answer the “100 million dollar question” posed by Dr. Parikh: “should the deal be cancelled?” In our opinion: (a) as demonstrated earlier, present deal is economically unjustifiable; (b) there are other techno-economically viable, socio-environmentally desirable, and immediately implementable alternatives to the Enron project; there

are emergency options that can be resorted to, in order to satisfy the shortfall in capacity during the period before these alternative options become operational; (d) there are many innovative options for financing the alternatives to the Enron project as well as financing the emergency options. (The last three arguments are discussed in a separate paper.) Thus, based on these four arguments our unequivocal answer to the \$100 million question is: we should cancel even the first phase of the Enron project.

In fact, our contention is that this 100 million dollar question is inadequate, especially, when we are talking about the deal which has such far-reaching and severe implications. The question should be broader and should deal with the possible implications of this deal to the very health of the power sector in Maharashtra and the interests of the power consumers in Maharashtra. As mentioned by Prof. A.K.N Reddy, the Indian power sector in general is plagued by four crises: capital, performance, equity, and environment. Looking to projects like Enron as a panacea and inviting them at any cost, betrays a shallow understanding of the responsibilities and the problems of the power sector in India. They may appear to help us out of capital crunch in the short run, but, as it is clear by now, in the long run, we will end up paying exorbitantly. Certainly, these mega-projects would never help us to resolve the other three crises, especially. Hence, in addition to carrying out the project-specific analysis, we need to evaluate mega-deals like Enron with criteria based on these larger and long-term considerations.

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The Enron Controversy: Alternative Options for Electricity in Maharashtra

Shantanu Dixit, Girish Sant, Subodh Wagale

The issue of alternatives to the Enron project has become an extremely critical in the debate on this controversy. But, before grilling the anti-Enron groups over this issue, it should be understood that the onus of providing the answer to this question is on MSEB (Maharashtra State Electricity Board). MSEB should have prepared a detailed power plan for the period 1997-2010 well before the Enron project was proposed in June 1992. And if MSEB has been sitting content with projected shortfall without seeking other alternatives, then this failure of government agencies should not be allowed to become an excuse for bringing in a disastrous project like Enron.

Coming back to the question of alternatives to the Enron project, there are two problems here: (i) If the Enron project were cancelled, what are the immediately implementable options which would satisfy the “unmet demand” during the period (1997 end to 1999 end) before the alternative projects come on line. Let us call these “immediate alternatives;” and (ii) If the project were cancelled what are the alternatives to satisfy the demand after year 2000? Let us call these “long-term alternatives.”

The neglect of the distinction between these two types of alternatives as well as neglect of various political, organisational, and practical complications involved in both these types results into rendering most of the suggested alternatives as soft targets for Enron supporters. A range of such suggestions on alternatives — ranging from home-made turbines to brochures of Danish and Swedish technologies — could then be easily dismissed as techno- regressive, unrealistic, costly, or with insignificant benefits. Thus the two challenges in the issue of alternatives should be understood clearly. On one hand, it is necessary to continue to work on seemingly futuristic and unrealistic alternatives in order to transcend limitations imposed by the prevailing conventional paradigm and to arrive at a fundamentally different policy framework. On the other hand, it is also necessary to understand the need for some practical, step-wise program for transition towards a new policy

framework for the power sector. Hence, this paper deals with these two types of alternatives separately.

Section 1: Immediate Alternatives

The main argument of Enron supporters is that if the project were to be cancelled, then alternative capacity addition will be delayed by two years, and the losses due to the “unmet demand” during these two years would wipe out all the benefits due to the savings achieved by avoided “excess payments” to Enron. We, on one hand, do not agree with the calculations underlying this inference (dealt with in a separate paper). And, on the other hand, we want to point out that there are some alternatives that can be brought in immediately to stave off this danger of “unmet demand” totally. Even according to the MSEB plans, during 1997-1999, the contribution of the Enron project will only be 695 MW (first stage). So, for the first two years (1997 end - 1999 end) even if we plan for about 600 MW, there should not be much short fall. Out of this 600 MW, about 200 MW could be generated through two options: (i) co-generation in sugar and other industries; and (ii) Time-of-Use metering. MSEB is dragging its feet for too long on implementing these and could easily exceed 200 MW mark if pressurised.

To satisfy the remaining demand for 400 MW, we suggest following two alternatives: (a) diesel generator (DG) sets and (b) gas-turbines (GT). With removal of restrictions on importing petroleum products for power generation, it is possible to employ these options.

(a) Large DG sets of 15 to 20 MW capacity are available in the market.

These DG sets could be clubbed together in groups of 2 to 7 to erect small power stations of 40 to 140 MW according to the magnitude of local demand. Such large DG set based power stations are being built at Yelhanka (Karnataka) and Bramhapura (Kerala) after securing necessary environmental clearances. The capital cost of this option is about Rs. 3 crore/ MW including other necessary basic facilities. (Compared to this, the capital cost of the Enron project is being quoted between 4.1 and 4.35 crore/ MW.)

(b) Gas turbines of up to over 100 MW capacity are being manufactured by BHEL. Siemens has purchased these GTs from BHEL and has installed them in Germany. A large market of refurbished turbines also exists. These GTs could be installed to suit the local demand and availability of fuel. The capital cost of this option is between Rs. 2.8 to 3.0 crore/ MW.

One general objection against decentralised options is that they lose on account of adverse economies of scale. However, as the Enron project has demonstrated that the principle of economy of scale need not hold true for all projects all the time. Further, the very decentralised character of these alternatives would allow their siting to be commensurate with the local demand patterns. This would allow great savings on account of: (a) reduced need for new T&D (transmission and distribution) facilities to utilise the new capacity; and (b) reduced T&D losses.

While suggesting these alternatives, we have put ourselves in the shoes of the new state government and have tried to understand its anxieties, limitations, and compulsions. Though aware of the various limitations and objections to these options, we are proposing these for two reasons. Firstly, being within the conventional techno-economic perspective, these two alternatives could be easily implemented with the present manpower and organisational structures. Secondly, they are suggested only as part of a salvage operation and are justified only on that ground.

1.1 Economic and Financial Aspects

Let us look at the economic and financial aspects of these alternatives. The total cost of electricity to MSEB from these options will be around Rs. 2.2 / kWh (at busbar i.e. at the doorstep of the plant) without any inbuilt increases like those in case of Enron. Compared to this, Enron's price will be more than Rs. 2.5/ kWh even in the first two years. Besides cost advantages, these options have two other merits. First of all, being dispersed, they involve considerably reduced T&D losses. And, secondly, after the long-term alternative options to the Enron project comes on line, this 400 MW capacity will be a reserve capacity for peak demand.

With capital cost around Rs. 3.0 crore/MW, the total capital requirement for generating 400 MW will be Rs. 1,200 crore. Considering the dispersed nature of this power options, not more than Rs. 400 crore will be required on account of transmission and distribution (T&D) for the entire 600 MW additional capacity. Thus total capital requirement including T&D would be about 1600 crores. Now, in order to utilise Enron's 695 MW capacity, MSEB will be spending at least Rs. 1000 crores (approximately @ Rs. 1.5 crore/ MW) from its internal resources.

Deducting this leaves about Rs. 600 crore to be raised from external sources.

Raising this amount need not be a big task for MSEB. Financial experts have suggested many innovative options for raising finance for the power sector. Here, we are presenting two immediately implementable options: (a) Structured Obligation and (b) Sell and Lease-Back. These can be employed in combination with other financial options:

- (a) **Structured Obligation:** In this option, a group of customers with guaranteed payment is selected. Payments from these customers are deposited in a separate bank account on which bond holders in this scheme have “first right of withdrawal.” By solving their credit problem in this innovative manner, SEBs can raise required finances from the open market. Rajasthan SEB has recently raised Rs. 250 crore through private placements of bond with this approach, at the rate of Rs 14.5%. (The effective rate of interest in Enron option is about 40 %.)
- (b) **Sell & Lease-Back:** In this option, some of SEB’s assets (with useful life) are revalued and sold to leasing consortia which lease them back to the SEB. In this manner while continuing production through these assets, SEB can raise finances at a rate of interest far less than the effective rate at which interest would have to be paid to Enron. Madhya Pradesh SEB has recently raised about Rs 100 crore using this option.

These practically feasible and immediately implementable alternatives will provide a valuable respite to the new state government to rethink power policies in a wider and long-term perspective without getting unnecessarily concerned over the departure of Enron.

Section 2 : Toward Long Term Alternatives

When we start thinking seriously about the long-term alternatives to the Enron project, many deep-rooted problems start reappearing from the underside of the proverbial carpet. As students of power policies, we are aware that there are no simple and straight-forward answers to these problems. However, as the Enron controversy is itself a product of the tendency to postpone confrontation with these problems, they need to be tackled immediately.

2.1 Fundamental Problems In the Indian Power Sector

At this stage, the Enron controversy is often posed as a dilemma of two contradictory imperatives. The choice is portrayed as the one between (a) rejecting Enron which, admittedly, is not a fair deal and saying no to prospective power customers (and, hence, to future development in the state) and (b) accepting the Enron Project with its baggage for future development. In a crude form, the dilemma is between accepting the expensive Enron project and rejecting future development. This reduction of the controversy into a crude and deceptive dilemma is itself dangerous. But more dangerous is the fact that this dilemma is used to suggest that the Enron project is indispensable for development. In this context, the issue of alternatives becomes immensely important.

Let us trace the roots of this so-called dilemma. On one side, the power sector in developing countries in general and in India in particular is facing four crises: Capital Crisis, Performance Crisis, Environmental Crisis, and the Social Equitability Crisis. All these crises are interlinked. For example, Performance Crisis is often cited as the root cause of Capital Crisis, whereas Capital Crisis and Performance Crisis are said to be aggravating the Social Equitability Crisis. However, only Capital Crisis gets overemphasised and isolated attempts to resolve Capital Crisis (like the Enron project) end up worsening the other Crises.

On the other side, there are some basic problems in the planning process. First, there is a clear lack of relevant data and in-depth analysis based on state-of-the-art techniques. For example, MSEB has not computed (or published) the capital required if the plant was to be constructed by MSEB itself. This computation is absolutely essential to assess the merit of the bids by the private generating companies. The second problem is the lack of comprehensive and integrated planning procedures. MSEB has not made an in-depth assessment of all the available options of power generation. Nor has it employed an integrated approach to resolve any of the above mentioned crises. Due to these two factors, there is a dangerous tendency on the part of the MSEB and other planning agencies to go for straight-forward and often simplistic solutions like Enron.

These two factors— limited analysis and constricted perspective — are two important underlying causes of the conventional paradigm comprising: (a) macro-economic growth rather than development as the driving rationale; (b) increase in the energy consumption rather than provision of energy-services as the criteria of success; and the strong

supply-side bias with total reliance on large, centralised projects based on conventional sources. The so-called dilemma between choosing Enron and foregoing development is the product of this conventional paradigm.

The only way to resolve this dilemma is to transcend the conventional paradigm. This could be done at three different levels. At first level to rethink the basics of power sector policies to arrive at a proper framework for designing power policies. At the second level to question the very basis of the larger energy policy which is now being entirely dominated by the power sector. And at the third level to challenge the foundations of our development policy which determines our energy policy and consequently the power policy.

Though there has been some work at the second and third level, it is not yet adequate for arriving at concrete suggestions for power sector policies. But coming to the first level of rethinking, we have ourselves made one such effort in the form of a two and half year long study on designing an alternative power plan for Maharashtra state.

2.2 Least-Cost, Integrated Power Plan for Maharashtra

Starting from the least-cost plan designed by Prof. A.K.N. Reddy and others, we have prepared a detailed power plan (Least Cost Power Planning : Case Study of Maharashtra State) for the state of Maharashtra for the decade of 1991 to 2001. This plan is based on economic and technical analyses of sixteen different options. These include options which are being implemented by MSEB like reduction in T&D losses, cogeneration, time of day (ToD) metering as well as options that have not been considered by MSEB at all such as: reduction in demand through efficiency improvement of refrigerators, lights, motors, fans etc. Our study demonstrates that these options are capable of substantially reducing our dependence on large centralised plants like Enron and at the same time they are cheaper than these centralised plants.

Table 1 shows the potential and cost of demand side management (DSM) options. It must be noted that these options are cheaper than the centralised plants.

Table 1: Potential of major DSM options in Maharashtra by year 2001.

DSM Option	Peak Power Saving MW *	Energy Saving MU *	Annualised Cost (Rs/kWp/Yr.)
Compact Fluorescent Lamp	680	1670	1,866
Solar Water Heaters	250	950	8,196
Refrigerator Efficiency Improvements	35	335	6,424
Commercial sector	170	540	6,114
Irrigation Pump Set	390	2790	3,855
LT industry	165	900	2,793
T industry	310	3300	2,793
T & D loss reduction	175	1400	3,368
Industrial Load Shifting	250	Nil	2,156

* These are indicative figures. More precise figures are used in the LCPP report.

** Rs/kWpeak/Yr. is the annualised cost (of investment, O&M etc.) per peak kW saved in 1992 Rs.

Note: Life cycle costing and Screening curve method is used to compare and integrate these options with the supply options (of centralised and decentralised plants).

Table 2: Potential of Decentralised generation option considered in the LCPP analysis

Option	Installed Capacity MW	Cost Rs/kW/Yr.*
Sugar Cogeneration	500	10,046
Co-generation (in other industries)	500	13,964
Small Hydel Plants	200	6,889
Producer Gas	100	13,518

* This is life cycle cost in 1992 Rs. at 100% PLFn. Table 1 & 2 are adapted from LCPP report mentioned at the end. Costs given in these table are Life Cycle costs, and as such are not directly comparable with often quoted capital costs in Rs./MW terms. Please refer LCPP for more details on table 1 and 2.

Our analysis revealed that for meeting the same demand of energy services (such as motive power, lighting etc.) the options chosen on the basis of the integrated, least-cost plan would cost 25% less! They would also reduce our dependence on large fossil fuel burning plants by more than 50%!

In many developed countries it is a common practice to design such integrated plans. In most states in the USA, it is even mandatory. One such plan prepared by Pacific Gas and Electric Company (a large utility in California) for early 21st century found that one third of their incremental demand would be met by renewables, another third by efficiency improvements, and rest by conventional generation.

Due to resource and data limitations, our plan need further refinement before it could be adopted as a full-proof plan. However, it has served two important functions: (i) to validate the claim that de-centralised generation and efficiency improvement options can meet a large share of increasing power demand at a substantially lower financial and social cost as compared to the conventional plan, and (ii) to strengthen the methodology for such integrated and least-cost planning.

To sum up, we feel that if rational decision-making processes are allowed to operate, then various techno-economically feasible, financially viable, and immediately implementable alternatives to projects like Enron can be adopted.

Reference:

Sant, Girish and Dixit, Shantanu (1994). Least Cost Power Planning — A Case Study of Maharashtra. Unpublished but widely distributed report. (This report is available at the PRAYAS address. A contribution of Rs 60/- towards photocopying and postage cost will be appreciated.)

MNCs: The New Messiahs and Old Justifications: Investigating Enron Corporation's Claims of Providing Development Assistance to India

Subodh Wagle

Summary

In her recent testimony before the US House of Representatives, Ms. Linda Powers, the Vice President, Global Finance, Enron Development Corporation, USA claimed that the private companies (MNCs) are now providing vital development assistance to developing countries (Powers, 1995). To support her claim, she described, in detail, activities of Enron Corporation through its controversial Dabhol project in India. In this article, based on their own analysis of Enron's Dabhol project in India, the present authors investigate the claims made by Ms. Powers. The entire testimony is very insulting and contemptuous towards developing world in general and India in particular. The present article makes a strong plea to take serious note of various claims made in the testimony and the underlying attitude. At the end, this article raises some crucial questions that developing countries should ask before letting multi-national companies (MNCs), especially the private power producers, into their economies.

Two Images of MNCs

Multi-national or trans-national corporations (MNCs) have been in the eye of many a storm in developing countries. Even their staunch supporters find it hard to absolve them from responsibilities in episodes like Exxon Valdez and Bhopal disaster in 1984. As a result, the image of MNCs as callous, anti-people, profit-mongering conglomerates is too familiar in countries like India. It is often alleged that this image of MNCs in developing countries is strengthened by the left-dominated media and academia and by political parties and bureaucracies that have direct interest in a statist approach. However, even the so-called non-left (e.g. Gandhians and Sangh Parivar in India) have always been sceptical about the role of MNCs and their intentions.

In contrast, in the new era of structural adjustments and liberalisation, privatisation, and globalisation (LPG) of developing economies, a new positive image of MNCs is being gradually cultivated. The image is grounded in the argument for a “new path” of development in the context of the failure of the “old path” based on two main tenets: (a) active role of the state in the development process and (b) control over private and especially foreign interests. This argument highlights inefficiencies, corruption, and wastage involved in the “old path” and pitches for “new path” based on efficiency, productivity, and technological sophistication. The argument is further strengthened by overemphasising the financial crunch currently faced by many governments in the developing world . In conclusion, the neo - classical panacea of LPG is recommended as the only alternative left for all developing countries who are expected to follow the trail-blazing Asian Tigers. Here come the MNCs, playing an important role of suppliers of badly-needed capital and sophisticated technology. Their entry is thought of as mutually beneficial to both the MNCs and the inviting country. They are portrayed as business houses that, in the process of earning fair profits, will pass on the benefits to the host countries in the form of improved infrastructure, sophisticated industry, and a strong and vigorous economy.

The New Role Of The MNCs: Development Messiahs

However, our recent discovery indicates that this positive image of MNCs is bland and inadequate in comparison to the role these MNCs are claiming for themselves. According to this claim, MNCs are not just business houses working for fair business profits but also benefiting the developing economies in the process . But it is claimed that, through their business ventures and using their own money, MNCs are supplying the much- needed development assistance and relief to the developing world. Further, it is also claimed that this development assistance is provided in such a magnitude and with such effectiveness that any bilateral or multilateral assistance program is no more needed.

This new role of the MNCs as “development messiahs” is exactly and precisely the core argument put forth by Ms. Linda Powers, Vice President of Global Finance, Enron Development Corp. in her testimony to the Committee on Appropriations, U.S. House of Representatives (Powers, 1995).

The argument put forth by Ms. Powers of Enron has two major elements: (a) that the MNCs are doing exactly what any foreign assistance program ought to do and (b) hence, all money that goes into assistance and aid should be diverted to lending agencies to provide loans to these pioneering MNCs. This article deals only with the first element about which Ms. Powers argues as follows,

“Private parties, like our company and others, are now able to develop, construct, own, and operate private infrastructure projects in these countries. In the process of doing so, private parties are able to achieve the two [key] things which U.S. foreign assistance efforts have since long been trying (without much success) to achieve: (1) the projects are serving as action- forcing events that are getting the host countries to finally implement the legal and policy changes long urged upon them; and (2) as an adjunct to these projects, to win local support, the private developers are installing **substantial** (emphasis ours) amounts of medical facilities, schools and the like to alleviate current problems in these countries (Powers, 1995:2).”

To support her claims, Ms. Powers cites the facts and figures of Enron’s controversial project near Dabhol in India. In the process, she comes with a panoply of puzzling, questionable statements and claims which can not at all be substantiated if we consider facts and analysis carried out by many in India. But, first let us restrict ourselves to the investigation of her claim of being a ‘development messiah’. Here, there are again two parts of her claim. According to her, “private parties are bearing the costs” of discharging two important functions of development assistance: (i) effecting the “growth and development of the recipient countries” and (ii) “alleviating current problems”.

Enron's First Claim: Working for Development

The first function of effecting growth and development of the recipient country is carried out “not only by addition of physical assets to the country, but, equally important, the creation of ‘commercial infrastructure’ “(p.5). Ms. Powers explains the term “commercial infrastructure” as “the policies, laws, and practices that are the basic tools of a market economy” (p.7). In this context, according to her, Enron’s Dabhol project has been a god-sent opportunity for ignorant government, bank, and other officials in India to learn a few things about their profession. In her words:

“Working through this process (of evolution of Enron’s Dabhol project) has given the Indian authorities a real and concrete understanding of the kinds of legal and policy changes needed in India, and has given the Indian banks a real and concrete understanding of sound project lending practices. Moreover, our company spent an enormous amount of its own money — approximately \$20 million — on this education and project development process alone, not including any project costs (p. 6).”

However, the reality is totally different. The entire process of development of Enron’s Dabhol project was completely shrouded in secrecy and mystery. It is alleged that the involvement of government officials was kept minimal and the agreements were drafted by Enron’s experts. As one author has pointed out, the initial memorandum of understanding for this first-ever private power project was signed in just twenty four hours after initial contact with the officials (Samant, 1995). Further, even basic information was restricted to very few officials and was denied to elected representatives of the people even after the power purchase and other agreements were signed. It is also alleged that objections raised by experts from the Indian lending banks were overruled using political arm-twisting (Sridhar et al., 1995). Unfortunately, strategy to get this information through legal channels was not successful for the lack of adequate information and resources on the part of activists who were not united in their ranks. So much for the educational process.

Further, Enron tried to include this amount of \$20 million (which is mentioned in the quote as spent on “education” of officials and project development costs) in the capital costs on which it had planned to earn exorbitant returns. However, it is reported that officials of Indian banks forced Enron to relent on this issue. One interesting question: if Enron did not spend this huge amount of money on education of officials as it claims, then where has this money gone?

About the “education” of Indian bank officials, Ms. Powers claims:

“Five lending Indian banks are playing a major role in the total financing package for our power plant project. They have not previously done project financing, but through the financing process on our project they have developed a thorough understanding of project finance, international lending practices, project credit evaluation and security requirements (p.7).”

However, this claim has no basis at all in reality. Though Indian banking practices are different in certain aspects from those of the U.S., giving an impression that Enron taught project financing to the concerned Indian banks is the height of audacity. To give a rough idea of the nature and scale of the operation of the concerned Indian banks following information would help. Industrial Development Bank of India (leading bank financing the Rs. part of the DPC project) had assets of nearly Rs. 31,000 crore (\$ 9.7 billion) in 1992-93 (Business India, 1994). This is not an isolated example of such audacious and completely false claims. But it is sufficient to indicate how these MNCs are, on one hand, creating a bad image of India and Indian institutions and, on the other hand, deceiving U.S. government and legislators to further their own interests.

Enron's Second Claim: Providing Immediate Relief

Let us investigate the second developmental function Ms. Powers refers to. This relates to providing relief to immediate problems by making available “medical, educational, employment, and other benefits.” According to her:

“Specifically our capital expenditure budget for the project includes \$24.5 million (emphasis original) for a fifty-bed hospital, a primary school, a vocational school, drinking water pipelines for the surrounding villages and road improvements. The budget also includes an additional \$75 million (emphasis original) for port improvements (dredging, new jetties, etc.) that will be available for general public use. Finally, the project includes employment for several hundred persons, both at plant and elsewhere, with an annual payroll of \$5 million throughout the life of the project. We provide extensive training for the employees, and these are high value jobs relative to the local economy (p. 7).”

Firstly, the \$24.5 million provides for various major heads of expenditure which include the cost of land for plant and fuel facilities, resettlement and rehabilitation of people displaced by the project, road upgrading for the transport of equipment and water pipelines about 70 km long. The remaining small amount would be spent on the facilities listed in quote. This is nothing but the strategy of throwing some crumbs to silence possible trouble-makers and has nothing to do with development assistance.

Coming to the \$75 million invested in port facilities which are claimed to be “available for general public use”, prevalent public understanding in India is that the Indian people and governments will get very small share of benefits from the port facility. As per present public knowledge, Enron will hand over the construction jetty (just 150 meters in length) to the government only after the construction of the project is over (i.e. when it will be obsolete for Enron). Whereas, the fuel jetty of 1000 meters (which would be equally useful to the Indian government) will be the exclusive property of Enron.

Regarding the issue of provision of employment, Enron’s Dabhol power project would provide employment only to about 93 people in the first phase (IDBI, 1994). Most of these employees will be highly qualified and will come from major cities in India, if not from abroad. Very few local people will find direct employment at the project and that too on low income menial jobs.

In case of the annual payroll of \$5 million, first, it must be noted that this will come directly from MSEB’s (Maharashtra State Electricity Board) customers and not from Enron’s funds and, hence, cannot be claimed as development assistance from Enron. Secondly, it is not such a big amount when compared to the revenue Enron would be collecting from MSEB, which is estimated to be between \$ 400 million (1997) to \$ 800 million (2017) per year. Finally, an important question is what portion of this amount would be utilised to pay foreign employees and consultants from subsidiaries and sister companies of Enron, Bechtel, and GE.

To sum up, the claim that MNCs in general and Enron in particular are “footing the bills for development assistance and producing more visible results” has no basis at all in reality. The money Enron is spending on project development costs can not be called as development assistance, as Enron is not providing any substantial immediate relief. Further, all this money would have to be repaid at exorbitant interests rates (estimated to be around 33% p.a. in \$s) by Indian taxpayers. This certainly is an interesting way of these new messiahs of providing development assistance.

Some More Questionable Claims and Statements

Here are additional examples from the testimony of similar statements and claims and our rejoinders, based mainly on our study of Enron’s Dabhol project in India.

Statements and Claims: In trying to project Enron's image as a protector of the divine principles of market economy, Ms. Powers dismisses the idea of 'natural' monopolies and praises the developing countries for accepting "intense competition" as the appropriate way (p.3).

Ms. Powers in similar vein also recommends "transparency and predictability" in regulatory reforms (p.5).

Rejoinder: It is alleged that Enron prevailed upon the key decision-makers in the state and central governments to avoid competitive bidding. So much for the "intense competition".

Ms. Powers' plea for "transparency" in regulatory reforms is hypocritical. Firstly, Enron itself tried its best to keep this deal secret and successfully avoided public scrutiny of its agreement until it was forced to publish the document due to a combination of factors. The earlier opposition parties that were critical of the deal came to power and declared their intention of making public the details of the deal. Some journalists got hold of the power purchase agreement and published some important pages of the document in a national magazine. Secondly, by devising a combination of elaborate legal bindings and highly punishing penalty structure in the agreements, Enron has attempted to nip in the bud any future attempt to regulate its affairs.

Statements And Claims: Ms. Powers takes great pain to paint MNCs as innocent businesses with clean intentions: "When a firm like Enron .. goes into a foreign country to undertake a project, just what do we do? In the simplest terms, we identify the need, select a suitable site, design an appropriately sized facility, work out fuel supplies, develop relations with local and central government officials, negotiate power sales contracts, finance and construct the facility, and operate and maintain it over its useful life (p.5)."

At another place, in the same vein, she states that the MNCs "undertake enormous risks and costs, get compensated for these risks and costs, and still deliver the services more reliably and cheaply than the existing public projects in these countries (p.4)"

Rejoinder: Talking about the "need" and "appropriate sized facility", in case of Dabhol project, there was no need for such a large base load project in the state of Maharashtra according to criticisms by the World Bank. The Government of India had chosen nine suitable sites for gas based power project from the perspective of power planning in India. Enron's present site at Dabhol was not among them and was chosen by Enron not to suit to the needs of Indian power planning, but to

suit to the main element of its own future plan: marketing gas in India in a big way .

Coming to the next quote, Enron's claim of taking enormous risks and getting compensated for these risks appears straight forward and reasonable. But the analysis of the actual agreements demonstrates that, in addition to the most comprehensive and expensive insurance cover (paid for by Indian taxpayers), Enron has passed the burden of all kinds of possible risks to MSEB (Maharashtra State Electricity Board) or to its contractors to the extent that the project is virtually risk-free for Enron. However, Enron still demands an absurdly high rate of return as compensation for the so-called high risks. Our estimates indicate that the effective internal rate of return (IRR) Enron is demanding for this project is as high as 28% on "claimed equity". Further, it is alleged that the project cost is inflated by about 20% which would further raise IRR value on the "real equity". As against this the reasonable IRR for this risk-free proposition should be in the range of 17 to 21%.

The claim of delivering electricity at cheaper prices compared to the existing public projects is again not true in case of the Dabhol project. The issue of high price of Enron's electricity is dealt with in detail in our paper on techno-economic analysis in this collection.

Statement: While claiming that Enron has been successful in effecting many changes, that the World Bank and other institutions have for long been recommending, Ms. Powers states: "The state of Maharashtra, where our project is located in India, is now revamping its electricity rate structure to end electricity price subsidies."

Rejoinder: This is a baseless statement. In the case of the Maharashtra State Electricity Board (MSEB), there is no price subsidy, what MSEB has is cross-subsidy. In this arrangement, the industrial sector earning profits bears the burden of subsidising the agricultural sector and domestic sector. The MSEB is not loosing any money due to this cross-subsidy. No American corporation, and especially one working in oil and natural gas sector, has any right to object to cross subsidy. First, the entire American infrastructure is built on heavy subsidies from the federal government. Secondly, it is widely known that the main intention underlying the whole Gulf War which the American government recently fought at a huge cost to the American exchequer and heavy loss of human life, is to protect the interests of the American oil and gas companies in the region.

New Colonialism and Old Justifications

While exposing the lies perpetrated by MNCs, we also need to take cognisance of the insulting and contemptuous attitude of these MNCs in general and of Enron in particular towards India and other developing countries. The general tendency, especially in academia and bureaucracy, is to dismiss any attempt to object to this contemptuous attitude as an emotional over-reaction. This results into overlooking of the dangerous implications of this attitude. On one hand, adopting such an attitude, further emboldens the MNCs into imposing more and more atrocious demands and manipulating the developing countries so as to extract increasingly unfair profits that amount to sheer plunder. On the other hand, it allows the MNCs to be audacious enough to put such lies on record causing unimaginable damage to the image of developing countries like India.

Before going into the wording and undertone of the testimony, let us see in what position Enron has managed to manoeuvre MSEB (Maharashtra State Electricity Board), the state Government of Maharashtra (GoM), and the sovereign Government of India (GoI). Though all concerned parties are now disowning the responsibility of securing the counter-guarantee from Government of India, it is quite clear that Enron has benefited immensely from such a counter-guarantee. This is in addition to a guarantee from the State Government of Maharashtra to protect Enron from the possibility of the evasion of the responsibility of payment through “(arbitrary) government fiats.” These guarantees are a one-sided affair and MSEB, GoM, or GoI have no protection against any disasters or lapses on the part of Enron or its proxies. The need for such protection against the misdeeds of the unscrupulous MNCs is obvious from India’s past experience with Union Carbide at Bhopal. Despite this, both the (earlier) GoM and GoI accepted such humiliating treatment as if they were habitual defaulters or despondent rulers of some banana republic.

This insult hurts furthermore if we consider the amounts involved. The yearly payments to Enron from MSEB are about \$ 400 million while the yearly cross-subsidies MSEB provides is to the tune of \$ 500 million. For such small amounts, the GoM and the GoI have agreed to sign guarantees under which Enron can take recourse to the English laws and attach all assets of these governments including the Parliament House and Presidential Palace. This kind of treatment betrays

the real attitude of MNCs which are often hailed as honest business partners interested in fair business.

Coming back to the testimony of Ms. Powers, it is entirely marked by an underlying contemptuous tone. She describes the situation in all developing countries including India as follows: “the lights don’t stay on, the water isn’t safe to drink, the roads are dangerous and congested, and phone calls are impossible to make or receive (p.4).” And the conclusion is: hence, MNCs are going into these countries to teach Indians and others how to manage these simple things and be civilised.

If viewed in the proper perspective the dangerous implications of this argument will become clearer. Imagine what the reaction of an American would be if somebody makes equally audacious and insulting suggestions. For example one could suggest that the semi-government public transport agency in Bombay BEST (which operates a huge fleet with far better performance) should go to Los Angeles and other U.S. cities and towns to teach a few lessons about public transport to US authorities and “convince” the U.S. government about implementing necessary policy changes like Energy Tax. This would significantly reduce the menace of the global warming which threatens the very existence of the world. In addition, it would also help the ghettoised and riot-ridden poor of south- central LA, to reach available jobs.

Another suggestion could be about sending the present Indian Chief Election Commissioner to manage the next Presidential elections in the U.S. in 1996. In recent elections, in a poor and ‘utterly backward’ country like India, he had successfully motivated and helped around 70% of adult population, mostly poor and illiterate, to exercise their franchise. He would be a great help to the U.S. in improving the democratic participation within the USA where around half the adult populations (mostly blacks, women, and poor) is kept away from voting using regressive laws and deliberate tactics and just about one-third finally manage to vote.

Finally, the situation in the U.S., the home country of Enron, could be described in the following terms: “Families are breaking down, educational standards are abominably low, teen mothers give birth to crack babies, crime rate is very high”. These conditions are much worse than those of India as described by Ms. Powers in the above quote. Firstly, Enron needs to work on these equally serious problems in its home country before worrying about India. And, secondly, if these are the secondary effects of the ‘development; then we Indians need to think twice about these.

The testimony of Ms. Powers not only creates a bad image of India, but does something more serious. The contemptuous attitude therein could be compared to the justifications provided by the colonial regimes of the last couple of centuries that were here to 'civilise' the 'barbaric natives'. Thus, while claiming to be the new messiahs of development, the MNCs seems to be taking on the 'white man's burden'. The economic benefits of the MNCs operation for the host country is itself a matter of debate. But, this attempt to legitimise the economic operations using the old colonial justifications like the 'white man's burden' is far more dangerous and needs to be resisted with all possible might.

Precautions Against MNCs

As mentioned before, this new claim of MNCs of being development messiahs and the misinterpretations and lies that are put forth to support this claim will have to be exposed and resisted. It is especially important in view of the large-scale, unquestioned acceptance of the neo-classical panacea of LPG by the mainstream media, academia, bureaucracy, and political parties in developing countries. These mainstream macro-organisations have already convinced themselves about the inevitability of the entry of the MNCs on their terms. In the process, they have accepted MNCs as honourable business houses with the clean intention of making honest fair profits. This testimony by Ms. Powers and the recently raised serious objections on the Enron project in India, together, point at the true nature of MNCs and, hence, underscores the dangers in accepting this image of MNCs.

Further, it is also necessary to juxtapose this lack of honesty and integrity on the part of MNCs with their immense economic and political power. If allowed to remain unconstrained, this deadly combination would wreck havoc in developing countries. This fear and need for international surveillance and regulation of MNCs is also underscored by UNDP (UNDP, 1994). Another dangerous aspect is the entry of espionage agencies like CIA which are reported to be helping these MNCs in winning contracts in developing countries. CIA's role in Enron's success in clinching this deal is clearly exposed in these reports (Rajghatta, 1995). In this context, developing countries need to take some extremely important precautions.

Firstly, they need to really check the fundamental rationales and justifications put forth while inviting the MNCs to every proposed

project in the infrastructure sector. For example, in the case of Enron's Dabhol project MSEB should have asked: (i) does the state of Maharashtra really need what the project is offering viz. base load capacity?; (ii) does it really have to resort to a power plant based on Enron's gas imported from Qatar?; (iii) does it really have to invite Enron's capital and GE's technology considering the exorbitant prices charged for both.

In this connection, developing countries also need to double-check whether they have already exhausted indigenous options that are less costly. In case of Enron's Dabhol project, MSEB needs to check whether it has really exhausted technologically practicable and economically viable options that are cheaper than Enron option like efficiency improvement, demand-side management, and renewable energy sources.

Secondly, developing countries need to check whether proposals coming from MNCs are fair by their national as well as by international business standards. Again, in case of Enron's Dabhol project, MSEB need to investigate this entire deal in detail. How much would it be paying over the entire project period? What are the capital costs and what is the profitability of the project to Enron in this project? How much would the MSEB be paying for the improved technology imported by Enron and the risks Enron would be taking, and whether the amounts involved would be worth the benefits? What would the implications of this project in general and these payments in particular for the health of the power sector and the interests of taxpayers in the state of Maharashtra.

Finally, developing countries also need to actively and urgently work to improve their capabilities to monitor, control, and regulate the functioning of these MNCs possessing sophisticated technology, immense economic power, and without much scruples and stakes in the country and its people. Again, in case of the Enron's Dabhol power project and that of a host of other indigenous and foreign private power projects following it, India needs to ask an extremely important question: does it have technology, policy software, expertise, and above all public awareness and political will that are critical necessities to initiate any effort to control, monitor, and regulate the power generating private companies and ensure the health of its power sector and interests of its taxpayers?

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Roots of the Enron Controversy: Fundamental Ills of the Power Sector

Girish Sant, Shantanu Dixit, Subodh Wagle

1.0 Present Crises in the Power Sector:

The Indian power sector which is currently in the eye of a storm is facing a peculiar situation. On one hand, it is under increasing pressure to satisfy continuously growing demand for power, whereas on the other hand, as described by Prof. Reddy, it is dogged by four major crises: Capital, Performance, Environmental, and Equity (social justice).

India's electricity demand is growing at a rate of 7% p.a. This would require doubling of the present installed capacity by year 2004. This needs massive investments of about Rs 173 billion in the Power Sector each year. At the same time, Government owned State electricity Boards (SEBs) are facing acute financial crises. The SEBs have total accumulated losses of Rs 40 billion. Financial support from the government's development plan is already high (more than 20% of the plan expenditure) and can not be increased further. Even the multinational agencies, like World Bank, have declared their total inability to fund such large investments expected in the developing countries.

In addition to this Capital Crisis, the internal efficiency of the power sector is dismal. There is a tremendous scope for improvement in the various related aspects like the efficiencies of the power plants and of the transmission and distribution (T&D) networks, the internal resource generation, the speed of project implementation, and the operation and maintenance of plants as well as networks. This Performance Crisis has been talked about for a long time but without much impact.

At the same time, the crises of environment, and of social justice related to power sector policies, which are not discussed much at official fora, have aggravated. Despite over 30 years of support through planned development expenditure in the name of the poor and despite claims of 100% electrification of villages in many states, only 50% of the households in the country are actually connected to the grid. Affluent

sections of the society are mainly responsible for increasing power consumption but the social and environmental costs of power production are largely born by the poorer sections of society with little direct benefit out of it. The price paid by these people is in the form of displacement, increased hardships due to increased pollution, and in many cases, complete loss of control over the natural resource base and hence of livelihood.

2.0 The Mainstream Logic Underlying New Power Policies

Though all the four crises are equally important and need equal consideration in policy making, the governments, state as well as central, seem to be focusing on the Capital Crisis while totally neglecting the other three. The underlying logic epitomises the conventional paradigm of development. First, environmental concerns as well as issues of social justice are seen as digressions from, if not brakes on, the progress of the power sector. Secondly, future development of the power sector is seen as possible only by generating more and more power and that too only through centralised, capital-intensive, and large-scale conventional options. This logic restricts the future development to a single capital-intensive path. It inflates the Capital Crisis out of proportion and relegates the other three crises to obscurity. Further, as mentioned before, it is no longer possible to resort to multilateral borrowings while it is politically unattractive to go for internal resource generation. The simplistic solution to the over-bloated Capital Crisis is, then, to invite indigenous and foreign private investors.

The gaps in this logic underlying new power policies focusing on privatisation are important and critical. First of all, with world-wide acceptance of ideas like sustainable development and people's participation in development, total neglect of social and environmental concerns cannot be justified. Secondly, with great advances in the technical and economic viability of renewable energy and energy efficiency options, total dependence on capital-intensive conventional options is equally unjustifiable. The new power policy measures in India need to be viewed in this context.

3.0 New Policy Measures and Their Hasty Implementation:

In the early nineties, the government of India initiated a series of legal, financial and administrative measures and offered incentives to attract private investment in the power sector. Indian Electricity Act was

modified to remove legal obstacles to the private ownership of generation plants and T&D networks. Now, 100% foreign equity and a debt : equity ratio of 4:1 is allowed in power projects. Major incentives for private investors are: (a) a two-part tariff which guarantees a minimum of 16% post tax return on equity, in any foreign currency, at normative operating performance and (b) guarantee by the concerned state government and counter guarantee from the Central government to honour financial obligation of SEBs towards independent power producers. For new projects (other than fast track projects) different mechanisms are being formulated to guarantee payments by SEB to the promoters.

Another striking feature of the policy guidelines is the lack of differentiation between specific technology characteristics.

For determining the return on equity, same norms for availability are applied to the gas and coal based projects. Gas based projects have an inherently higher availability than the coal based plants. This implies excessive profits to the promoters of gas based projects.

While, the state owned power utilities are obliged to bear the social responsibilities and to continue uneconomical operations, they are not allowed to charge remunerative tariffs to all sectors, which at times results in huge operating losses. This partisan treatment of the private sector is not limited only to this issue. Generally the SEBs are neither allowed to raise funds from the market nor to have an equity base. Obviously they do not have the freedom to change tariffs and subsidies to earn even the monetarily sensible and legally justifiable level of profits.

In addition to this, there is a complete lack of incentives to the private parties to minimise project costs, as competitive bidding procedures are normally avoided. However, the guaranteed profits are linked to the capital cost.

Moreover, the new policy measures, even in their totality, are hardly comprehensive. They leave out a variety of important issues like the financial viability and the future role of State utilities, the social responsibilities today undertaken by the SEB's, the social and environmental implications, and the impact on the economy in general and on other public sector units like BHEL in specific.

Two main features of the present practice that strike one immediately are; the lack of a comprehensive and long term perspective underlying these changes in the policy, and their hurried implementation. Lack of comprehensive and long term perspective leaves many old

questions unanswered and poses many new ones. International agreements and obligations promised in the new policies will have far-reaching and critical implications for the well-being of the national economy. The long term impact of such policy measures, in a capital-intensive and core sector like power, are serious, critical, and difficult to judge without an in-depth analysis and forecasting. The lack of such analysis represents a serious lacuna in present power planning. The importance of these transactions is apparent, considering the likely drain foreign exchange and burden on the central government, due to just a handful of private power producers. If the terms offered to Enron are extended to the first 5,000 MW of the seven fast track projects, that are in the offing, then the foreign exchange outgo would be to the order of Rs 7,500 crore (US \$ 2.34 Billion) each year for next 20 years ('Current Power Policies A Critique', National Working Group on Power Sector.).

4.0 Effects of the lack of a holistic approach towards the power sector:

Presently, conflicting claims and counterclaims are being made about the financial, technical, social, and economic benefits and implications of these policy measures. For example, it is argued that privatisation will help in making the power sector more efficient and will be able to provide much needed power to the industry which, in turn, will be beneficial to the economy. At the same time, some experts feel that privatisation will benefit the industrial sector at the cost of other sectors, because the new private (independent) power producers will cater mostly to the profitable industrial consumers, thus depriving the SEBs of their main revenue source. As a result, the socially required investments for the benefit of the disadvantaged sections of the society (e.g. rural electrification) would be reduced. It is also felt that heavy dependence on foreign capital will prove disastrous to the economy.

Secondly, the government has often tried to go ahead stubbornly with the intended policy changes without coming out with clear and frank responses to various concerns and objections raised. This hurried and repressive implementation has created an atmosphere of distrust and helplessness among people and the organisations concerned about these issues. The opposition and resistance to many power projects such as Sardar Sarovar Project (Narmada Dam), Singhrauli, and more recently ENRON can be cited as examples. Though these conflicts have concentrated on different aspects of each project, they have their origins

in the government's failure in formulating an open, viable, environmentally sustainable, and socially just power policy.

5.0 Enron as a symbol of the ills in the power sector:

The Enron controversy has brought out these issues once again. And there are many more projects that are in the pipeline at different stages of finalization. If the present situation is allowed to continue, there would be utter chaos on the policy front. On one hand, the government agencies will try to push forward every single project without any clear cut standards or criteria, essential to carry out a rigorous and honest appraisal of the projects. On the other hand, with no basis for carrying out a fruitful dialogue, the increasingly suspicious people's organisations will continue to resist each and every project, on every single ground, and with all possible might. In the ensuing confusion, the people and their interests will ultimately suffer.

The above analysis highlights the need for a comprehensive power policy which would be based on in-depth analyses, and would be capable of protecting the interests of the people. It must be clearly understood that there is no easy way out. The proposed privatisation and globalisation of our erstwhile state-controlled power sector is a major fundamental decision. And it will require equally fundamental changes in the power policies and structures that are in line with our national objectives. On one hand, this will need learning from experiences of many other countries, developed as well as developing. But, on the other hand, any effort towards the wholesale import of policies from any other country would be dangerous.

In this context, we feel the need to carefully evolve a process of designing appropriate policies. In our opinion, this process will have to be sensitive to two important issues:

Firstly, any effort to impose policies without taking the people and their organisations into confidence would continue to create further confusion and strife. It is important that the government should ensure that the entire process of policy design and decision making is thoroughly transparent. The people and their organisations should be given an opportunity of direct and real participation and should have a say in the entire process. We suggest two immediate steps in this direction: (a) The central and all the state governments should immediately publish white-papers giving detailed and full techno-economic, financial, and organisational information as well as a detailed

picture of proposed policy reforms; (b) The central and state governments should create properly empowered structures with adequate representation to various people's organisations to see the process of policy design. In the meanwhile, these same structure should be empowered to review decisions about future developments in the power sector.

Secondly, we need to make a well-co-ordinated and focused effort to equip institutions other than the official agencies to analyse and effectively participate in the monitoring and regulation of the affairs of the future power sector dominated by powerful national and transnational private companies. This is especially required in view of the clear failure of present government institutions in ensuring interests of the people and the power consumers. In this context, universities, research institutions, research wings of public sector power companies, and retired officials of public sector agencies can play a major role. If some foreign institutions, multilateral bodies, or bilateral projects are found to be helpful to this healthy process, then their help should also be welcomed.

This collection of papers and articles, aimed at a broad cross-section of the populace, deals with the following issues:

- ❑ The real price of Enron power.
- ❑ The performance guarantees from Enron and related penalties in case of default, and what they mean for Enron and for MSEB.
- ❑ Answer to the argument that “though the Enron project is expensive, we should go ahead with the first phase, because ‘no-power’ is costlier than any power”.
- ❑ Viable, immediate and long-term alternatives to Enron.
- ❑ The issue of international back-lash if the Enron project is cancelled.
- ❑ What Enron says to the U.S. government about the Dabhol project as well as about India and its officials.
- ❑ Lessons we can draw from the Enron controversy towards ensuring the health of the power sector in India in view of the large number of private power projects coming up in the near future.