

FACTS

against

MYTHS

VIKAS ADHYAYAN KENDRA

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INFORMATION BULLETIN

Myths About Power - Part I

- by Abhay Mehta

COMMENT

A study of the first private sector project in India after 1991 is set down below. It focuses on the power project set up by the MNC Enron Corporation in Maharashtra. The history of the project is one of the most interesting episodes in post independence India.. The saga is still in progress and the last chapter is yet to be written.

After 1991, the new policy as announced by the Government of India, allowed for additional private sector participation in the power sector. Thereafter in 1993 a contract was signed in Maharashtra between the state-owned electricity board, the Maharashtra State Electricity Board (MSEB) and the Indian subsidiary of the Enron Corp., the Dabhol Power Company (DPC) for the supply of 695 MW of electricity. One of the conditionalities in the agreement was that the MSEB could, if it so choose, increase the supply of electricity to 2015 MW by an expansion in the capacity of the plant and a change in fuel.

The contract between the two parties was signed after detailed examination of various aspects of the project were supposedly conducted by both the Central and State governments. It was also claimed that all necessary clearances that the law required were obtained. In particular, the 'techno-economic' clearance was purportedly issued after an examination of the technical and economic aspects of the project by the sole authority under the law, the Central Electricity Authority (CEA).

While this was going on, there was a great deal of opposition to the project on diverse ideological, economic political and environmental grounds and from the most diverse quarters. These included political parties, a loose knit coalition of former chairmen of the CEA, various State Electricity Boards, environmentalists, consumer organisations, academics

like Dr. Parekh the head of a leading developmental institute and the World Bank etc. The World bank, to illustrate, was explicitly not in favour of the project. Its comments were invited on atleast three different occasions and on each occasion it took a very strong stance against the project on purely economic grounds.

In State of Maharashtra, the contract proved to be controversial. Most of the parties in the opposition including the Shiv Sena and the BJP opposed the project for a number of reasons. In the elections that followed, an alliance of the Shiv Sena and the BJP came to power in April 1995, almost solely on the issue of possible malfeasance in the contract. The new government undertook to reexamine the terms and conditions of the contract.

After a detailed examination by a special cabinet committee, the Government of Maharashtra came to a conclusion, inter alia, that the contract was not in public interest. It decided to cancel the contract in August 1995.

To legally substantiate that decision, the GOM filed a suit in the Bombay High Court. This suit sought the cancellation of the contract on various grounds. A compendious number of documents from the records of the GOM were attached to substantiate the various allegations in the suit.

Within 3 months of that decision for reasons that are not altogether too clear to date, the government backtracked on its decision without assigning any coherent reasons. It went on to 'renegotiate' the contract without any changes in the old contract with a number of false claims.

MYTH : *The country is experiencing a severe power crisis.*

FACT : The installed capacity in India as of 1996 is 84,000 mw. The peak demand is at best of the order of

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60,000 MW, perhaps less. On the face of it there should be a surplus of power. But obviously that is not the case. The effective utilisation of installed capacity is one of the lowest in the world. With an installed capacity of 84,000 MW not only a peak demand of 60,000 MW is not met but the production is considerably lower (of the order of 45,000 MW), leading to massive shortages.

Electricity is one of the most ubiquitous commodities that surround us. However, unlike other commodities, it has to be consumed when produced. Electricity cannot be stored except in another form which necessarily involves a loss. The installed capacity has to be more than the peak demand to be able to meet it. The system must be ready at all times to be able to meet the changing pattern of demand.

For various reasons set out here, the peak demand is not fulfilled resulting in a serious shortage of power. The prime factor is the availability of power stations. The low availability of most power stations is further exacerbated by the pattern of demand for electricity in India. The demand for power varies very drastically during various points during the day. In the morning, as the middle class all switch on their geysers and other appliances, there is sudden surge in demand. This surge is repeated in the evening when more or less every one turns their lights on at the same time. In the night, the demand is considerably lower than in the day in fact almost less than half the peak demand.

Most power stations in India run on coal. Coal is not delivered to them on time either because of a failure to pay (as in the case of Delhi and other Boards) or due to the unavailability of wagons.

The SEB's owed the National Thermal Power Corporation (NTPC) Rs. 6,500 crores in October 1997. i.e. more than 60 % of its turnover. NTPC in turn is unable to pay Coal India Ltd. (CIL) and other suppliers of fuel. The boards themselves do not have the money, for a variety of reasons. However, the primary reason is that of large scale theft.

Power stations are at some distance from the mines and enormous quantities of coal have to be transported to them. For the usual set of reasons, the number of wagons available to the railways and their turnaround time is relatively low. Therefore the coal does not reach the stations on time. Depletion of stocks leads to a shutdown. A thermal power station requires about a fortnight to be turned on again.

A large fraction (a quarter or about 20,000 MW) of the power stations in India are over 25 years old. Besides age, the problems of poor or indifferent maintenance leads to regular breakdown in equipment. The resulting shutdowns are euphemistically attributed to 'unscheduled maintenance' as opposed for planned shutdowns for planned maintenance and repairs. All

the above and other reasons, which if necessary can be resolved easily, effectively reduce the average time that a power station is actually capable of generating power (availability). It ranges from a low of 40-50% in Bihar, a middling 80% in Maharashtra to a high of 90% and above in the case of NTPC.

What the numbers mean, say at an average availability of 75%, is that over the course of a year, the station is incapable of producing power for 25 % of that time i.e. 91 days of the year.

The so called 'Agricultural subsidies' have very little to do with the woes of the power sector. The real reasons for this state of affairs are myriad. They include one of the highest rate of 'Transmission & Distribution losses' (T&D losses) in the world: one of the world's lowest utilisation of installed capacity and a host of other problems.

The mass scale production of power took off after independence with an annual rate of growth of about 7-8% p.a. Like most systems that we have inherited there is a systematic devastation of the system for a variety of reasons. The power system, as are most systems in India, are in a state of perpetual crisis lurching from bad to worse. The symptoms are obvious to anyone outside of Mumbai. Regular power cuts ranging from an hour to most of the day, irregular supply, voltage fluctuations etc. to those lucky enough to receive power in the first place. Most of these T&D losses are simply a euphemism for theft. Power is very easy to steal.

Delhi which represent the worst and the future of India in many respects, DESU is one of the most corrupt and bankrupt organisations in the country. The middle class and the industries account for anything between 60-80% of the theft. Contrary to popular myth, relatively little of the theft is by the 'juggi' dwellers. For example, consider the fact, that almost all buildings in East Delhi do not have regular meters. Even affluent upper middle class and elite housing societies that a over a decade old do not possess a 'regular' meter. Instead most households receive a fixed (and absurdly low) bill that is totally incommensurate with the actual consumption of electricity. The rate of T&D losses in Delhi is an alarming 60% representing a theft rate of nearly 54% i.e. out of every 100 units received/produced by DESU, over half of the simply disappear!

On the other hand, Mumbai is an example totally contrary to Delhi. It has a unique mixture of a private sector organisation (the BSES) serving the suburbs and a public sector organisation (the BEST) serving the city proper. The average rate of T&D losses for both organisations is the lowest in the country. It is roughly the same for both BEST and BSES (about 11%). Both are extremely profitable entities with BEST's profits gross subsidising its transport division and BSES a favourite on the bourses.

MYTH : *Electricity production is environmentally benign.*

FACT : Almost all electricity in the world is produced by burning fossil fuels (coal, natural gas and fractions of distillation of crude oil). The production of electricity is quite simple technically. The fuel is burnt, the burning fuel produces and/or heats gases which then drive turbines. These rotate, producing electricity. The efficiency of the process depends primarily on the fuel used. It ranges from 30-40% in the case of coal and about 46-54% in the case of gas.

If a kilo of a good Indian coal could be completely converted to electricity one would produce about 3.5 units of electricity. However only 1.25 units of electricity are produced in a typical power station i.e. an efficiency of about 35%. This electricity is then transported across distance, so some of it is necessarily lost. This loss ('transmission loss') ranges between 1% to 6-7%. The electricity is then used by the consumer. Further losses are incurred in this process, of the order of as much as 70%. For example, as much as 80% of the electricity that reaches a typical incandescent bulb is lost in the form of heat.

All this means that the overall conversion efficiency from coal to the bulb in the house is of the order of 15% to 20%. A typical urban middle-class household consuming 250 units a month uses about 8 kgs. of coal a day or 2.4 tonnes of coal a year!

About 80% of the electricity produced in India today is produced from coal. Coal is quite cheap and available in large quantities. Consider the case of Singrauli in Bihar, which produces enough coal to light up a large part of India but leaves most of its town's inhabitants without electricity. The living and working conditions of the towns residents are among the worst in the country, even after accounting for Bihar.

Another of these choices is illustrated by the problem of ash. After the coal is burnt, there is a considerable amount of ash that is left over. The quantity of ash generated in India amounts to about seventy million tonnes a year. This ash can be used in a number of ways ranging from a base for building materials like bricks, road foundations, etc. However, for most parts, there is no further use made of the ash and it is simply dumped in a huge hole and (called the ash pond) left there. For an average power station the ash pond itself amounts to a few hundred acres. To date there has been no conscious decision to use these mountains of ash constructively or to enforce any such action.

Air pollution and its abatement is yet another example. Burning coal spews a large number of gases, chiefly oxides of nitrogen (Nox :NO₂ and NO), sulphur dioxide (SO₂) and carbon dioxide (CO₂). The amount of SO₂ and Nox can be reduced very considerably, as much as 85 to 90%, by a variety of standard techniques. The investment required is an additional 20% or so over the

cost of the generating equipment. This would amount to less than 5 paise a unit of electricity over the life of a generating station. However, most power generating stations in India are equipped with only rudimentary pollution control equipment. The new ones coming up, save a few, are no better. (See also box on page 8).

MYTH : *Enron is the World's Leading Power Company.*

FACT : Enron has very little to do with electricity. It is primarily a gas distribution company. It has been claimed on numerous occasions that Enron is among the "World's Leading Power Company". This was claimed on affidavit to the courts and in innumerable press reports and all official governmental correspondence.

In 1993, Enron's total sales were \$7.1 billion (22,000 crores). Of this, only 1% [\$73 million or Rs. 220 crores then] of their total revenues was derived from electricity.

In contrast, almost all Indian power companies, private or state had sales that were higher. When the company first came to India, their experience in building and running power stations was limited to a few stations in the USA and the Philippines of capacities ranging from 28, 105 and 110 MW stations in the Philippines, a 110 MW station in Puerto Rico, and 149 MW to 450 MW plants in the USA.

MYTH : *The size of the Dabhol project and the fuel that the project will use is related to Maharashtra's need for power.*

FACT : Enron's project will use Liquefied Natural Gas and not natural gas. The difference is appreciable. Natural gas in most parts of the world is simply transported through a pipeline. Gas that comes out of a field has three primary fractions. A fraction of the gas that cannot be liquefied, a fraction can be liquefied very easily by merely applying pressure to it and a fraction is liquefiable only under extraordinary conditions of extremely cold temperatures of 165° C. This gas when so liquefied can be transported across distances since the degree of compression is of the order of over a 1000 fold. The capital investment is of the order of 4 billion dollars at the liquefaction end. The transportation requires specially constructed refrigerated ships capable of maintaining the gas at the low temperatures.

Each ship requires an investment of \$ 150 -200 million. A fleet of four to six ships is required. The overall capital requirement is of the order of 5 billion dollars. Given the extraordinary capital investment, the only way a producer would invest the enormous capital if there is a long term contract for enormous quantities signed. A typical contract for the supply of LNG is of the order of 15 billion dollars. The amounts are so enormous, given the capital recovery of \$ 5 billion and the base price of gas. Each such deal is unique. LNG is not a tradable commodity and there is no market in LNG.

Japan, given its geographical location and near total lack of petroleum resources is the main importer of LNG.

Conversely, given the economics of LNG, a power station of about 2400 MW is needed to consume the gas from one such supply train.

In India, the DPC proposed to set up a mega power generating station to be run on gas. This gas was to be imported and brought to India in the form of liquefied natural gas (LNG). The size of the station was about 2500 mw so as to be able to consume an entire train of LNG. i.e nothing to do with the pattern and demand for electricity in Maharashtra.

A team of officials from Enron Corporation and General Electric Co. (GE) arrived in New Delhi on 15th June, 1992. They held discussions with the chairman ONGC and Secretary Petroleum. The team arrived in Bombay on the 17th evening. On 18.6.92 and 19.6.92, the team visited over half dozen potential sites in Maharashtra. *On the morning of the 20th, the MSEB was "handed a term sheet" by the team. Thereafter, on the same day, the MSEB signed a Memorandum of Understanding (MOU) with Enron and GE.*

This MOU specified that the MSEB would buy electricity and/or capacity from Enron which would build, own, and operate (but not transfer) a plant of about 2400- 2400 MW (nominal) capacity. The power station was to be built near Dabhol in Ratnagiri district, about 300 km south of Bombay. The MOU was signed within three days of Enron's arrival in Bombay. It specified that a plant "with a minimum capacity of 2000 MW" would be set up, that the MSEB "agreed" to the "need to set up a 2000 MW plant" to be "run on Liquefied Natural Gas (LNG)", that the "Electrical Power Purchase Contract" would be a "Contract for 20 years term between Power Venture and MSEB" and that the "Contract (was) to be structured to achieve an all in price of US \$ 0.073/kWh."

A plant for generating electricity is usually set up after an initial examination of the context in which the plant is to be used as well as the need and pattern of demand of electricity is determined. Maharashtra, as most of India, suffers from a peaking shortage.

Secondly, there are enormous reserves of one of the world's best qualities of coal at Chandrapur in Maharashtra.

In the light of this background, the MOU between Enron and MSEB posed a problem. MSEB had gone ahead and signed the MOU with the MSEB. The MOU had already specified the size of the plant, the fact that imported fuel (about 4 times as expensive as the best quality of coal) was to be used and the final price for the electricity that was to be paid to Enron for the electricity. Effectively the nation was presented with a fait accompli.

There is no explanation on the record or otherwise as to why the decision involving the largest series of payments in India's history was taken in such an absurd hurry. The MOU forecloses among other issues, the question of pricing, questions and analyses of Maharashtra's needs (peaking versus baseload), impact of pricing, the relative economics of coal versus imported natural gas, the forex considerations, the meta economics, pricing, inviting other parties to quote a price etc., etc. None of these issues for a really strange set of reasons appear to have been considered at all. The decision to set up a huge power generation project in the private sector with a foreclosed obligation on a statutory corporation, the MSEB, to buy power at a predetermined unprecedentedly high rate was taken in great haste without there being any detailed consideration of the matter or any application of mind whatsoever or any public debate.

MYTH : The objection to the project is primarily on environmental grounds.

FACT : Not so! The opposition to the project was/is on diverse ideological, economic political and environmental grounds. The opposition also came from the most diverse quarters including political parties, loose knit coalition of former chairmen of the CEA and various SEB's, environmentalists, consumer organisations, academics like Dr. Parekh the head of a leading developmental institute, the World Bank, etc.

The World bank, to illustrate, was explicitly not in favour of the project. Its comments were invited on atleast three different occasions and on each occasion it took a very strong stance against the project on purely economic grounds.

MYTH : The entry of Enron into India was mandated by the World Bank itself.

FACT : Most conventional critiques put the blame for almost all problems affecting this country to a combination of the World Bank, the IMF and GATT. Atleast in this particular instance, a strong case can be made in favour of the World Bank.

The World Bank's analysis of the Dabhol Power Project reads like a strong critique. It was the most up-to-date and the most coherent critique of the project and its consequences. It was and is the World Bank's institutional and operating mandate to support, expand and if necessary, force the entry of foreign private capital into countries that were averse to such an entry. This was particularly true in the eighties. The dramatic change in India's path was imposed upon by the World Bank's conditionalities to the loan agreements.

In this context, the analysis of the World Bank is particularly important. Its detailed, rational and one would think irrefutable critique should have sounded the death knell for the Project. It had claimed that the MSEB would incur severe financial losses because (Enron's) "LNG generation (of electricity) at a variable cost of about paise 150/kWh would displace coal-based

power costing paise 30/kWh."

Further, on the issue of the "Cost and value of LNG Power", the World Bank concluded that consumers would not be willing or able to pay such a price for LNG power from Enron and therefore the "Bank's standard project economic analysis" concluded "that the project is not viable". Additionally, there would have to be "substantial tariff adjustments" for MSEB. "Prices for industrial consumers would at the minimum have to be doubled in nominal terms to recover the cost of LNG power". An "across the board adjustment" of tariffs to all categories of customers and not just industrial ones, with "annual increases" of about "15-20% against the Bank's 5-6% inflation estimates" and that the "project is not a least-cost choice for base load power generation...compared to Indian coal and local gas."

Interestingly enough, a part of the World Bank note was leaked to the press. Snippets from the Bank's analysis were carried in most newspapers. The resulting controversy nearly threatened to derail the project.

In response to the World Bank's analysis and increasing press criticism, Joseph Sutton Vice President of Enron wrote to the Chairman, MSEB that "I feel that the World Bank opinion can be changed. We will engage a PR firm during the next trip and hopefully manage the media from here on"

The Bank did not change its "opinion". It reiterated its earlier stand and severely criticised the MSEB's attempts to justify the project on grounds that its own system would decline in efficiency and reconfirmed their conclusion that the Dabhol project "... is not economically justified and thus could not be financed by the Bank."

MYTH : The Government exchequer and the people will not be burdened with the payments

FACT : A simple question that is posed: How are we going to pay for it?

Enron's project alone will produce much more electricity than is being used by all of industry in Maharashtra in 1996-97. Further, the nature of the contract obliges full payments by the MSEB, failing which, by the GOM. This is so, even if all of the output of electricity is not utilised.

MSEB's finances are already troubled. The GOM was forced to advance a sum of Rs. 600- 800 crores to the MSEB on an "emergency basis".

We have to pay. There is no trivial solution of simply negating the contract. The GOM has committed itself before the High Court and arbitration tribunal - it did not leave any ground of escape at all, for a future cause of action.

These contractually binding payments, with the GOM's liability are unlimited for all practical purposes and

GOI's to the order of Rs. 35,000 Crores +. In addition, both GOI and GOM have committed all their assets past, present and future against the claims of the Company.

The guarantees given by the Union of India, on the security of its consolidated fund, start at Rs. 1500 crores a year, increasing annually at a minimum of 9% a year, and indexed to the rate of inflation, etc. totally amount to over Rs. 35, 000 crores. This is for the First Phase of the project (740 MW), towards guaranteeing a debt component of Rs 2, 000 crores at best. Maharashtra's share of its central allocations and share of revenues will be deducted directly by the RBI in order to pay MSEB's contractual obligations to Enron. Whether, in fact this is allowed under the Constitution is a good question.

The consequences necessarily arising from the contractual obligations of any magnitude, hitherto unprecedented, are of particular interest and are probably unimaginable. Simply the economic consequences, as a result of the contractual obligations, are substantial enough to "adversely effect our economic growth for years to come" in the words of a once concerned academic. To put these numbers in some perspective, these amounts nearly approach Maharashtra's entire budgetary expenditure.

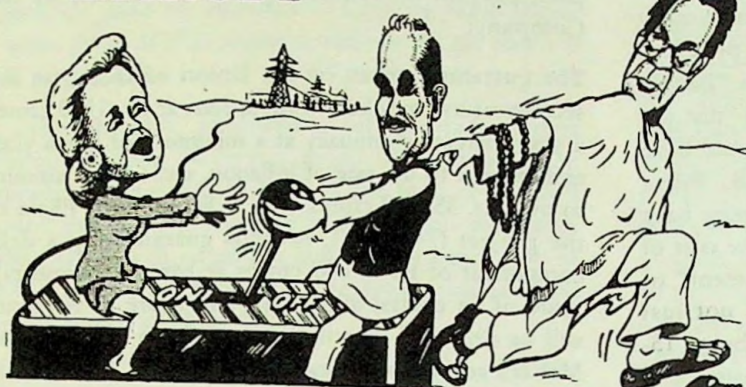
Maharashtra's rate of industrial tariff are already among the highest in the world. In the World bank's opinion there would be "substantial adjustments" (i.e. very substantial increases) in industrial tariff to accommodate the high cost of Enron's power. This was reiterated by the GOM. Any further increase would affect industry very severely. Industry is already reeling under a tariff regime that is one of the highest in the world. It should have prepared a doubling of tariffs at the least (as per the World Bank) and then followed by increases to the tune of an additional 15-20% annually.

In 1995-96, MSEB increased its tariff rates. The current HT rate is the highest in the country with the dubious distinction of probably having the 2nd HT tariff rates in the world.

We believe that about 92 Induction Furnaces with a total production valued at hundreds of crores a year are shut down currently, on account of the recent tariff hike. Other industries like retooling mills, ferroalloy units etc. are also believed to be severely affected. Small scale industries in the Thane Industrial belt (a few thousand units) propose not to pay the new rates and have apparently obtained court orders to this effect.

With such a high tariff, there is no scope for any further increases. The much spoken about agricultural subsidies do not amount to much: they simply hide the T/D losses, which are much higher than the officially admitted figure of 15.9 % in 94-95: in all probability almost double than that. The real component of subsidy

'ENROFF'



(Courtesy: BLITZ, 12.8.95)

to the order much lower, perhaps none in reality. In any case it begs the question of amounts of the order of Rs. 10,000 crores a year.

MYTH : *The terms granted to the Enron project were provided to all other investors as well.*

FACT : The terms for the purchase of electricity by a utility seem to be unprecedented. The purchase of electricity by MSEB and the payments due therein are governed by various agreements signed. These include the Power Purchase Agreement (PPA), the Guarantee by the state of Maharashtra, the State Support Agreement, the Counter Guarantee by the Union of India and the Tripartite Agreement between the GOM, the GOI and the RBI.

The terms include the 'de-facto' import of nearly everything including the equipment and the fuel, no transfer of technology and payments more or less totally in foreign exchange. Additionally, they include a guarantee from the GOM that in the case of default in payments by the MSEB, the State of Maharashtra would be liable for all and any payments due to DPC by the MSEB under the terms of the contract. The state government has put a lien on all its assets; past, present and future in this respect. The interpretation of the state guarantee is through the application of English in exclusion to Indian law, though all the contracting parties are Indian entities, constituted under Indian law.

The Republic of India, in turn has counter-guaranteed the payments due to DPC. In the case that the government of Maharashtra defaulted in its guarantee, the government of India would be liable for some of the payments due. The GOI would directly deduct from the constitutionally sanctioned share of revenues due to the state of Maharashtra in case of the GOI having to make any payments. The Republic of India too has staked all its assets (including those abroad, save diplomatic and military) in surety of the payments due to DPC by MSEB. The payments due to Enron constitute one of the largest contracts (civilian or

military) in world history, and the single largest contract in this country's history. Payments amount to about \$1300 million in the first year with total payments around US \$ 35,000 million (Rs. 1,25,000 crores.) over the life of the contract. The payments are linked to various indices including the oil price index etc. so an exact estimation is completely contingent on assumption of the rate of change in various indices. In any case, a conservative low end estimate of the NPV of this stream of payments is about \$17 billion to about \$23-25 billion at the middle end.

These payments keep increasing because of the indices built into the payments, that include the \$ to Re. rate, the rate of inflation in India as well as the US labour inflation!, shipping and oil indices, etc. For example, a conservative rise of 8% annually thereabouts can be safely assumed simply on the basis of the Re. to \$ depreciation and the historical oil price index without any 'shocks'; i.e. of the order of 500 crores a year.

No upper bound can be placed on the payments. A conservative estimate of the NPV of this stream of payments is of the order of US 20,000 million or more.

Abbreviations used

- CEA:** The Central Electricity Authority, a statutory body created under the Electricity (Supply) Act, 1948.
- DPC:** The Dabhol Power Company, Unlimited. A subsidiary registered in India, held by MNCs Enron Corp. (80%), Bechtel (10%) and GE (10%). MSEB may be a 30% partner if it manages to raise the resources.
- MSEB:** The Maharashtra State Electricity Board, a statutory corporation under the Electricity (Supply) Act 1948. Sales of about Rs.7,600/- crores; no profits, installed capacity base of about 12,000 MW in 1996-1997.
- PPA:** The Power Purchase Agreement; the contract signed between the MSEB and DPC for the supply of about 2000 MW of power and/or capacity from DPC's plant near Dabhol in Maharashtra
- GOM:** Government of Maharashtra



CALENDAR OF EVENTS

17.6.92 Enron's team arrives in Bombay for the first time.

20.6.92 Within three days, MOU between Enron and MSEB for the largest contract in Indian history at an unprecedentedly high price and total breach of the law.

8.7.92 The World Bank's Opinion (solicited by the GOM) that the project is likely to have an adverse financial impact on MSEB.

7.92 The CEA commented on the MOU that the price agreed by the MSEB was considered to be high and in breach of prevailing norms.

13.7.92 Enron "advised" the Government of Maharashtra against "auditing" project costs and predetermining return on equity both of which are required by law.

4.9.92 The Chairman of MSEB, stated that "public and judicial scrutiny of business policy and decisions as per the Act will not be acceptable" by Enron.

30.9.92 The Chairman of MSEB, stated that "public and judicial scrutiny of business policy and decisions as per the Act will not be acceptable" by Enron.

30.4.93 The World Bank evaluation of the project found it unviable and placing a "Heavy financial burden on the MSEB" and refused to fund the project.

28.6.93 Enron felt that the World Bank opinion "could be changed" and that they would "manage the Indian media".

8.93 The CEA found the reasonable capital cost of plants, like Enron's to be Rs. 1.81 and Rs. 1.91 crores per MW in 1996 and 1997. This is against Enron's cost of more than Rs. 4 Crore/MW.

8.95 The official Committee of the Government of Maharashtra recommends the scrapping of the project on several grounds including "high cost of power, high capital cost, that the PPA was against public policy and public interest" as well as on grounds of corruption and the government institutes a suit to this effect in the Bombay High Court.

8.11.95 GOM announces renegotiations after repeatedly taking the stand that there would be no negotiations after Ms. Rebecca Mark, of Enron meets Shri. Bal Thackeray and it mandates the revival both phases, I & II, of the project.

26.1.96 The revival of both phases of the Project was formally announced by the GOM.

7.3.96 DPC writes to the CEA that there was no change in the tariff of the First Phase of the renegotiated project.

22.6.96 The IDBI notes that even after Renegotiation, Phase I of the project had not undergone any change.

8.96 The largest contract in the history of India, with contractually binding payments by MSEB to DPC exceeding US 30 billion, (Rs. 1,00,000 Crores currently) in the form of a binding PPA is signed.

4.97 The Supreme Court refuses to entertain an appeal against Enron.

The petition is pending since then in the Supreme Court of date (8.98) without any hearing at all. Work on the project continues as usual. It is expected to come on line in December 1998.

The Radioactive Fallout of Enron Power Project

A Study of Radon Concentration Released into the Atmosphere due to Burning of Natural Gas was title of a paper by M.C. Subba Ramu, T. S. Muralidharan and K.G. Vohra of the Division of Radiological Protection of Bhabha Atomic Research Centre. In this paper they observed and estimated the dose received by a by-stander due to burning of natural gas by the Tata Thermal Power Station and the Rashtriya Chemicals and Fertilisers (RCF) at Trombay. They found the dose varies from season to season between 0.04 to 2.6 rems per year depending on various factors like wind, precipitation, geographical features, etc. They also state in this paper that the release of radon due to the burning of natural gas reduces considerably when the gas is processed to remove impurities and fractionated to recover the heavier hydrocarbons. In this process about 30 to 70 percent radon gets removed from natural gas.

Sbri Ashok Kumar from Mumbai had sometime back raised this issue in connection with the Enron power plant at Dabhol. Again depending on various factors like wind, precipitation and geographical features, previous processing of gas to remove radon, etc. people in the vicinity of the plant might be in for a radiation dose of 0.4 rem to 25 rems per year in addition to other pollution burdens. 25 rems per year is 2,500 times the dose recommended by the International Commission on Radiological Protection for the general public.

In the circumstances, it might be prudent for it to take this hitherto 'unknown' fact into consideration. Over the long term, this would be of greater consequence than the back-breaking financial burden imposed by the project.

Contact :

R. Ashok Kumar
Type III/36 E Tata Colony,
Mahul Road, Chembur,
Mumbai 400 074

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766 Community Health Cell
No. 367 Srinivasa Nilaya Jakkasandra
1st Main, 1st Block Koramangala
Bangalore 560 034