

Coal plant will not avert a power crisis in 2004

By Dr. Janaka Ratnasiri
Executive Director, Climate
Action Lanka

There have been several statements and articles in print media in the recent past regarding the proposed coal power plant (CPP) at Norochcholai. The press statements quoting CEB say that the Government should go for the coal power plant immediately, if the country were to avert a power crisis expected in 2004. In these press statements and articles, some of the information given in support of the project were questionable. For example, recent press reports quoting CEB say that the project has received the approval of the environmental authorities (Island of 07.03.2000) and that there is no alternative to coal (Daily News of 28.03.2000). Both these are not quite correct. Hence, there is a need to clarify these issues.

I have discussed the basic issues concerning the adverse environmental impacts arising from the CPP and the advantages of going for natural gas (NG) instead for electricity generation in Sri Lanka, in several articles which appeared in print media recently (Daily News of 24.12.97, Daily News and Island of 25.08.99 and Daily News of 12.10.99). I am therefore not going to repeat them here. My last article was written in reply to some comments made by Dr. T. Siyambalapitiya on my previous articles. Dr. TS, who was attached to CEB earlier but presently writing in his personal capacity, has been a strong proponent of the CPP. He has written several articles trying to convince the public of the advantages of the proposed CPP and the need to take a quick decision on it.

Environmental Clearance

Dr. Siyambalapitiya has made some unqualified statements in his articles, which are difficult to accept. For example, in his article on 'It is time to make up our minds about the coal power programme' (Island of 28.07.99), he has written that 'All the concerned authorities and institutions have granted the environmental clearance to the project'. See also Island of 05.04.2000, where he says that 'Environmental clearances are ready'. It appears that there is some confusion regarding environmental clearances. In the case of the proposed CPP, there are three project approving agencies, the Coast Conservation Department (CCD) as the plant is to be built within the coastal zone, the Central Environmental Authority (CEA) as the transmission line crosses provincial boundaries and the North-Western Provincial Council as the plant lies within their province.

The Environmental Impact Assessment (EIA) report apparently has been approved by the last two mentioned agencies, subject to specific terms and conditions, which have not been made public.

However, with regard to the CCD approval, there has been no announcement so far made by the Department that such approval has been given. According to the Coast Conservation Act, the Department has to issue an environment clearance permit to the CEB before they could commence any construction work on the project. Perhaps, the CEB could confirm whether they have indeed received this permit from the CCD or not.

In the same article, Dr. TS says 'The best electrostatic precipitator (ESP) design available worldwide with 99.3% collecting efficiency will be installed to satisfy the standards for particulate emissions from the stacks'. Dr. TS is neither the Project Director nor the Contractor supplying the plant. As such, the public cannot accept what he says on this issue as an individual. Knowing the situation in the country with regard to purchase of equipment for macro-scale projects where the final decisions are made by non-technical persons at higher levels, how can he guarantee that

billions of rupees. Therefore, even specifying the best efficiency in the tender documents will not guarantee that the best particulate control equipment will be purchased.

Another statement he makes is that 'All effluents released to sea will be treated to remove metals, organic and suspended solids...After treatment, the effluents will comply with the tolerance limits specified in the Sri Lanka Standards for marine coastal discharges'. Without having any connection with the operation of the plant, the public cannot accept such a statement from Dr. TS guaranteeing 100% effluent treatment. Furthermore, there are expensive effluent treatment plants already installed in several factories in the country, both in the public sector and the private sector, but not operating regularly because of the high operation costs involved. Therefore, even if the best treatment plants are installed there is no guarantee that the level of effluents will be kept low at all times. Knowing the situation in the coun-

coal power plant operation came up. When questioned about the pollution of the environment, what a member of the delegation said was that in their coal power plants, one cannot see any coal from the mine to the combustion chamber. That means all operations such as transport, storage and feeding of coal are carried out totally enclosed without exposing coal to air. The proposed CPP does not plan for such operations.

Controversy over the site

With regard to the site itself, there is a difference of opinion between Dr. TS and another ex-CEB consultant, Mr Carlo Fernando. In the above mentioned article, Dr. TS says that 'Sri Lanka and overseas experts of various specialities have now confirmed that the most suitable site is west of the village Panniadi, commonly known as Norochcholai'. Mr CF, in his article in the Island of 06.09.99, says that 'From an engineering and economic point of view and security wise Mawella is the best site we now have for the project'. In the west coast, he advocates Negombo to be more suited than Norochcholai (Island of 06.10.99). Perhaps, shifting the site to Mawella would solve the problem that CEB is having now with the church. It may be recalled that the project has once before got rejected from Mawella, and it is very unlikely that it would get accepted to the community there now. Furthermore, a CEB spokesman says that the CEB will not be able to obtain any grants for conducting studies on alternative sites for the coal power plant if Norochcholai is dropped (Island 07.03.2000). According to this press report, the study for the Norochcholai plant has been funded by a grant from the Japanese government, who will also be funding its construction costing over US \$ 600 million.

Alternatives to coal

Mr CF says in his article in Island of 06.09.99 that 'Due to these most unfounded environmental protests, when coal power generation programmes are held up, the CEB has no other alternative but to go in for oil burning power stations like diesel'. The same sentiments have been expressed by the CEB spokesman in the report referred to earlier. Diesel is not the only option available if coal is dropped. It is unfortunate that these power consultants do not want to face realities and see the power generation scenarios in the rest of the world. Since I have written in my previous articles at length about the role of NG as an alternative to coal for electricity generation, I will not repeat myself here, except to say that it is a clean fuel available in plenty in the Middle East and SE Asian countries including Indonesia, Malaysia, Brunei and also Australia. However, its transport to Sri Lanka requires special facilities in the port.

(See page 10)

Under the Government purchase procedures, the CEB is expected to purchase only the cheapest plant meeting the CEB's specifications, whether the ESP or the entire plant, and not the best. The question now arises whether the CEB will specify the best ESP design with 99.3% or other types with better efficiency.

the best equipment available worldwide will be purchased. The same applies to his statement that 'It will use state-of-the-art equipment and technology similar to any other coal power plant presently being used in USA, Europe or Japan'. In any case, ESPs are not the best for coal plants using low sulphur coal, which makes particulates to have poor conductivity and lower the collection efficiency. The bag-house collectors, on the other hand, have higher efficiencies reaching even 99.9%, and are not vulnerable to premature failure of electronics and high voltage supplies due to high humidity as in the case of ESPs.

Emission and Effluent Control

Under the Government purchase procedures, the CEB is expected to purchase only the cheapest plant meeting the CEB's specifications, whether the ESP or the entire plant, and not the best. The question now arises whether the CEB will specify the best ESP design with 99.3% or other types with better efficiency. According to media reports, we have seen many instances in the recent past, where purchases are to be made to public sector bodies, the recommendations of Technical Evaluation Committees have been overlooked, particularly in purchases costing

try with regard to enforcing existing regulations on the control of industrial effluents and vehicular emissions, the public cannot have confidence on law enforcing authorities to ensure compliance with regulations in the case of the coal plant.

Pollution from Coal Dust

With regard to coal dust spread, Dr. TS quotes from the EIA report that 'Coal dust will be suppressed by spraying the stockpiles with water, compacting the piles, and employing de-dusting equipment during coal handling operations...Further protection from the wind will be achieved by planting trees around the site perimeter'. If the CEB has to depend on trees to stop coal dust from spreading, the readers could judge for themselves how successful it would be. Since the coal handling operations, particularly the recycling, will have to be done manually by labourers, one can imagine how they would look at the end of day's work. Whether they too would work at the desired efficiency is to be seen.

Last year, a trade delegation from UK visited Sri Lanka to promote the sale of their equipment for mini-hydro projects. During the course of the discussion, which was arranged jointly by the CEB and the British High Commission, the question of

Coal plant...

From page 8

11/04/2000 Island

If NG is not available in Sri Lanka in the immediate future, the CEB could use naphtha instead of diesel. In fact, CEB has already decided to use naphtha in one of its Combined Cycle Gas Turbine (CCGT) plants to be built shortly with Japanese assistance. Part of the requirements will be obtained from the petroleum refinery where naphtha comes out as a by-product, and the balance imported. Naphtha is not a traditional fuel for energy generation. It is more used as a feedstock in the chemical industry. The urea plant that we had a few decades ago, used naphtha as the main raw material. With the closure of the urea plant, the surplus urea was being exported. Since naphtha has even a higher calorific value than diesel, with no traces of sulphur or ash to produce particulates, it is a wise decision of the CEB to make use of naphtha to operate a CCGT plant. The other advantage of naphtha is that it is cheaper than oil, with a barrel costing only about US \$ 20 in Singapore, when oil costs about US \$ 30.

In the case of a NG, there is absolutely no generation of fly ash or bottom ash or particulates or sulphur dioxides or any dust or other effluents to pollute the air or contaminate ground water with it. As such, there is no need to have expensive control mechanisms and programmes to monitor SO₂ and particulates, which will escalate the operational cost of the plant. Though NO_x is emitted, it can be controlled easily using low NO_x burners to make the emission level much less than that from a

CPP. An article in Daily News of 28.03.2000 quotes the CEB Chairman as suggesting the enlistment of independent international monitors to ensure 'safeguarding the environment when the CPP is operating. But, at what cost, and is it necessary when there are better options? A NG power plant is intrinsically a non-polluter and no laws or regulations are required to keep the environment clean with such a power plant. Even the 1998 World Bank Guidelines on Thermal Power Plants say that 'PM₁₀ (Particulate Matter less than 10 microns) and SO_x measurements are not required for gas-fired plants'.

Quantifying of costs

Dr. TS's main argument against NG is that the cost of generating electricity with this fuel is about 30% more than that with coal. Based on certain assumptions, he has worked out the life cycle cost of electricity generation arriving at a figure of Rs 4.05 (US cts 5.70) per kWh for LNG, and a figure of Rs. 3.00 (US cts 4.22) per kWh for coal (Island, 02.09.99). In the same article, he says that 'The problem of most people is their inability to quantify: to quantify the costs and benefits... In my opinion, unless one has the input data accurately, it is better not to quantify. Otherwise, it will only mislead readers with a whole lot of figures that are not dependable.

In order to quantify, it is necessary to know the costs associated with such quantities as the capital cost of the equipment and its expected life time, cost of infrastructure to be developed

exclusively for the plant, cost of the fuel in the long term, cost of maintenance and operation including monitoring of emissions and ambient air quality, and the cost of financing the project. There will be many uncertainties in getting these information for anyone in Sri Lanka, and whatever figures arrived at will not be accurate to the cent. It is also necessary, when quantifying, to quantify the cost of damage to the environment and to the people's health, resulting from operating a polluting power plant, and the cost of mitigating and monitoring pollution. But, no consultant has included these in the costing.

Capital cost and life of plant

Dr. TS has made available the details of his calculations to me for which I am grateful to him. However, the values he has assumed for several parameters are questionable. For example, he assumes a value of US \$ 900/kW for the capital cost of the NG fired CCGT plant, possibly inclusive of the port facilities for unloading liquefied natural gas (LNG), storage and regasification. The turnkey cost of a NG fired CCGT power plant itself can be as little as US \$ 400 - 420 /kW for a large plant using the latest technology, according to Enron, a leading NG based power developer in the world. This leaves US \$ 450 million for port facilities, other infrastructure, development and financing costs for a 900 MW plant, which may be on the high side. Also, in his data, the total investment on a 300 MW CPP has been taken as US \$ 330 million which

should include the power plant, jetties, desalination plant etc. as done in the case of the LNG plant. However, the CEB figure for the total investment for the coal plant is US \$ 600 million, as mentioned earlier. This discrepancy needs a clarification, and if necessary, a revision of the calculations.

When one considers the potential of NG as a clean fuel for other sectors such as transport and industry, it is not correct to apportion the entire port facility to the electricity sector. As a matter of fact, this cost should be borne by the Government, at least a part of it, just the way it bears the cost of developing port facilities including infrastructure for container handling. The Government is not going to increase the price of commodities imported in containers simply because much money is invested in improving port facilities including access roads for transporting containers to and from the port. Hence, the entire cost of the infrastructure should not have been added to the capital cost.

Another questionable figures in Dr. TS's data are the construction periods, for which he assumes 3 years for a CCGT plant and 4 years for the CPP, tipping the balance in favour of coal. If one takes the actual construction period, excluding any time taken to make decisions and sign contracts, a more realistic set of figures would be 2 years and 5 years, respectively. He assumes an economic life of 20 years for a CCGT plant and 30 years for a CPP. This is something that should be verified from the suppliers of CCGT plants. It should be possible

with a proper maintenance schedule, to stretch the life for 30 years, as in the case of a coal plant. What is normally done is to refurbish the plants after a long period of operation, as done in the case of the old gas turbines at Kelanitissa. Hence, for the purpose of comparison, a 30 year life may be assumed for these plants also.

Cost of natural gas

Another important parameter is the landed price of LNG, which Dr. TS assumes as US \$ 5.26 /MBtu. The price of NG supplied to a country depends on the mode of its transport. Piped gas costs much less than gas transported in LNG carriers. According to International Energy Agency (IEA) statistics for 1997, piped gas in Europe costs about US \$ 2.50 /MBtu, while LNG delivered to Japan costs US \$ 4.00 /MBtu, when the crude oil cost was around US \$ 18 a barrel. Though crude oil price could have short-term fluctuations as happened recently, the long-term average had been around this value. The corresponding FOB values are about US \$ 2.67 /MBtu for ME Asian supplies and US \$ 2.85 /MBtu for SE Asian supplies. Thus, the landed cost of LNG in Colombo could be estimated as between US \$ 3.00 and US \$ 3.50 /MBtu, depending on the quantities contracted and the source. It certainly cannot be as high as US \$ 5.26 that Dr. TS has used. If at all, an upper limit of US \$ 4.00/MBtu may be used, considering any price fluctuations and small quantities contracted.

(Continued tomorrow)