

# Coal for immediate electricity generation

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**T**he Ceylon Electricity Board is imposing power cuts at a time when the country is in a threshold of a severe energy crisis. It has brought about hardship to the consumers and the industrialists have been severely affected from this. The situation will become even worse when the demand will exceed the supply in the year 2004 with the delay in the implementation of the proposed coal power plant. We have experienced enough Power cuts during the droughts. It has not only kept us in the dark, but it has also stalled our economic progress. The time has come for us to realize that coal is the only solution to the Energy Crisis and adopt a clear-cut energy policy in order to prevent this repeating again. An energy crisis will further weaken the Sri Lankan economy, which is already crippled by a war, which is in existent for almost eighteen years.

Sri Lanka could carry out mass power generation only with Coal, Oil, Hydro, Nuclear and Gas. Although many believe that solar, wind, wave and denro power could be used, no one has been successful in developing a large-scale energy extracting device from these sources. Our hydro power resources are almost over. As our country is not technologically advanced and it requires a very large capital investment, Nuclear Power is also not suitable. So we are only left with Coal, Oil and Gas. Out of the three, Coal will provide the cheapest solution for our energy needs.

## Crisis Today

Today the country has capacity installations to supply 14 million units of thermal power and 10 million units of hydro power each day even if we do not have any rain for the next 100 days. The daily requirement of electricity is around 20 million units. Even though the capacity installations are sufficient, CEB cannot supply the requirement because the cost of thermal generation is high. These are results of bad planning and mismanagement.

We have been striving hard to implement a coal power station for the last fourteen years and still we have even failed to implement one. The suspension of the Norochcholai Project will cause a further delay in the implementation of a coal power plant, which will further intensify this issue.

## Economic Loss

There is a great need for us to shift to coal power for several reasons. Today, hydro power supplies the base load for the country. We are paying the price for having put so much of trust on hydro power. Today almost 40 % of the power is generated from the thermal power stations in the country. The present thermal power stations in the country use Auto Diesel, Naphtha, Residual Fuel and Furnace Oil. Auto Diesel and Naphtha are two of the most expensive fuels for power generation. There is also a barge mounted 60 MW diesel power generator which sells a unit at Rs. 12/-. Average selling price of electricity today is Rs. 5.70/-. Today, the country is loosing 22 million Rupees a day, which is not a small amount by any means. This is mainly due to the fact that we use the wrong fuel for electricity generation. Failure to implement a coal power station will further increase this loss. A unit of electricity could be produced for just Rs. 3.80, using coal.

## People's Attitudes Towards Coal

Coal power generation is an alien to our country. There are no coal power resources in Sri Lanka. Memories of coal, of our people run back to the early part of the last century where trains were run in coal. These trains were operated by steam, which was produced by burning coal. Burning of coal produced a thick black smoke, which consisted of ash particles and

dust. During this era the environment was not a main concern. Due to green house effect and other reasons, environmental regulations were setup in the middle part of the last century. Since then, large number improvements have been made to the coal burning process, where a number of clean coal technologies emerged. These technologies have managed to bring the level of pollution, to acceptable environmental limits.

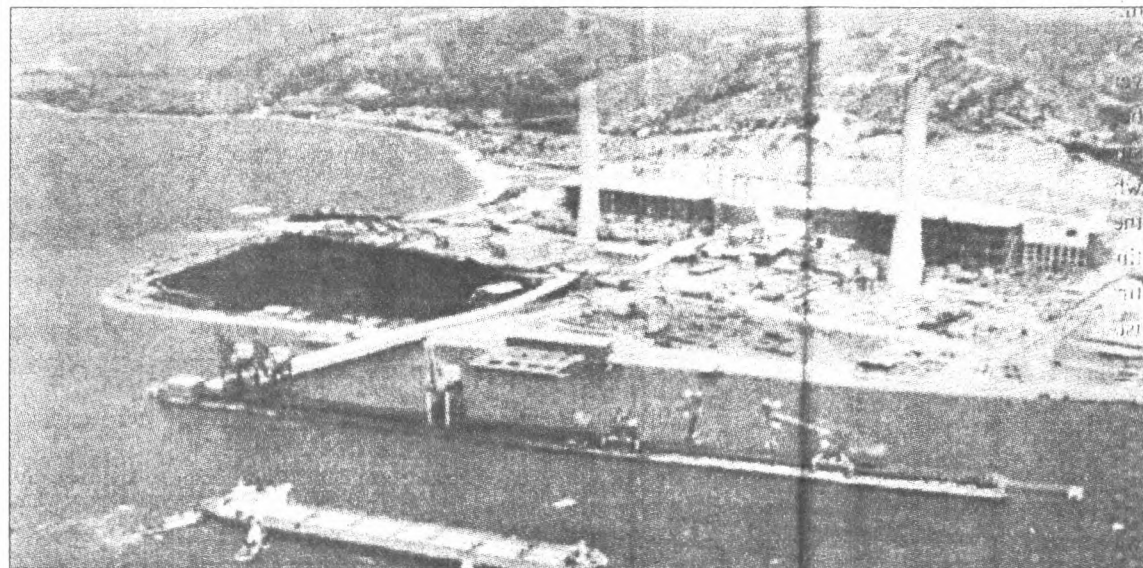
Although coal is new to us for power generation, it is not so, where most of the other countries are concerned. Consider a few of the developed countries like England, Australia, Greece, USA, Denmark and Germany. These countries are heavily dependent on coal for their electricity generation. Take our neighbour India, almost 70% of the Indian electricity is generated from coal. It would be surprising for most of us in Sri Lanka that there are around 60 coal power plants in India. 62,883 MW of the Indian electricity is generated from coal. The protests that we have here, are just for commissioning of a 900 MW coal power plant in Norochcholai. This example alone is sufficient to show the ridiculous nature of the protests by these environmentalists. Some say that Sri Lanka is too small in size

emission of carbon monoxide and lower combustion temperatures reduces the emission Nitrogen Oxides (NOx). Also in these plants coal is added with limestone in order to reduce Sulphur Oxides (SOx).

The combusted gas, which enters the stack comprise of ash particles, Sulphur Oxides and Nitrogen oxides. In modern power plants Electrostatic precipitators and fabric filters are employed to remove the ash particles. These filters remove almost 99% of the fly ash from the flue gases. The flue gas desulphurisation (FGD), which is the method used to convert SOx to gypsum which is used in the manufacture of cement. The FGD method removes almost 95% of the oxides of sulphur. The low temperature combustion plants reduce the emissions of NOx. The catalytic NOx reduction, which is a post burning technique further reduces the NOx level in the flue gas. By the combination of both these methods the final NOx level could be reduced by 80%.

## Conclusion

If a coal power plant is built in Sri Lanka it will adhere to all the environmental regulations and it would be built according to the technology of the nineties with these Clean Coal Technologies. So we have to come to



Castlepeak A and B power stations in Hong Kong

to have coal power plants. But, Hong Kong being such a small country, has Castle Peak A and B power stations, which have a generation capacity of 4110 MW. This power station is almost five times the capacity of proposed Norochcholai Power Plant.

## Clean Coal Technologies

In modern methods of combustion of coal, it is ground into a small power, which is known as pulverised coal, using a pulveriser or a mill. This is done to make the combustion process more efficient since it increases the surface area of combustion. By the advanced pulverised fuel combustion, thermal efficiency of a coal power station has increased from 5% in 1900 to 40% today. Development of advanced heat resistant high strength alloys has enabled the use of supercritical and ultra-supercritical steam, which can improve the plant efficiencies. By further improvements in plant design, it is expected that the plants could achieve efficiencies up to even 55%. Improvement of the plant efficiency, which results in a less quantity of emissions per unit of electricity generated, has made a significant reduction in the emission of carbondioxide to the atmosphere.

In modern power plants, pulverised coal burns in a bed of heated particles which are suspended in a gas flow. This enables rapid mixing of the air and fuel, which enables complete combustion of coal at very low temperatures. The complete combustion prevents the

a very positive stand about this as there is no serious threat to the country. What we have to know is that, we are not going to experiment something new to this world. We have forgotten that almost one hundred thousand families were displaced for the Mahaweli Project. That was because electricity is so important to the country. If a coal power station is build in Norochcholai only about 70 families will be displaced. The proposed site at Norochcholai is just 300 acres of barren land.

Mr. D. J. Wimalasurendra whom we consider as the father of electricity generation, vehemently believed that, industrialization is the only way that the standard of living of the people in Sri Lanka could be improved. So he advocated the government at that time, to develop resources leading to electricity generation. Mr. Wimalasurendra's vision is impeccable. For this, the country should not go for the generation of minimum required power. We should go for a situation with an ample excess of power. There is no doubt that, this would be a great boost for industrialization and improvement of quality of life. Let us never forget that 60% of the school children that are considered to be the future of our country, study under oil lamps. Each day we delay the decision of coal power, the country goes behind in development, making an irreparable loss to the economy, leaving an additional burden on the future generations of Sri Lanka.