

A closer look at Sampur coal power plant (Part 2)

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Cost of the Externalities – Health and Environmental Impacts

All of above deals with only the cost items 1-5. But what about the all important item 6,- Externalities. This deals the impact on many sectors of which the health and environmental degradation are the most important. While the CEB refused to even acknowledge the existence of such a cost in the past, their last long term generation plan, 2013-2032 appeared to give some consideration to this aspect. The report " Sri Lanka Environmental Issues of the Power Sector" quoted in the long term generation plan, includes a table of monitory estimates of such costs from different sources (Section 4.8 Table 10) Not surprisingly of the six sources quoted, ranging from Euro cents 6.0 /kWh down to 0.1 Euro Cents/kWh, the number used is the lowest without any explanation for this decision. It

Table 1 –Standards and Actual Measurements of Heavy Metals

–Coal Power Plants in USA

Metal Emitted	Emission Standard g/GWh from 2015	Current Emission Rate g/GWh
Lead	9.1	220
Mercury	1.4	117
Chromium	3.2	114
Nickel	1.8	110
Arsenic	1.4	76
Cobalt	0.9	29
Cadmium	0.2	5

Source – USEPA & IEA

would have been fair to use an average value at least as other sources place this cost as several times the highest number given in the above table . For the present let us assume the average of Euro Cents 3.0 per kWh as the cost of externalities, which the country has to bear, even if the CEB does not accept this responsibility. Thus the cost of the coal power now rise to Rs 22.40 + Euro Cents 3.0 = Rs 27.02 per kWh

The non- monitory impacts

It is important that we recognize the issues which can never be properly calculated in monitory terms as no amount of money can reverse these negative impacts that are inevitable from the use of coal.

A 500 megawatt coal plant can produce 3.5 billion kilowatt-hours per year. It burns 1,460,000 tons of coal, uses 2.2 billion gallons of water and 146,000 tons of limestone.

It also emits, each year:

- 10,000 tons of sulfur dioxide. Sulfur dioxide (SO_x) is the main cause of acid rain, which damages forests, lakes and buildings.
- 10,200 tons of nitrogen oxide. Nitrogen oxide (NO_x) is a major cause of smog, and also a cause of acid rain.
- 3.7 million tons of carbon dioxide.
- 500 tons of small particles. Small particulates are a health hazard, causing lung damage.
- 220 tons of hydrocarbons. Fossil fuels are made of hydrocarbons; when they don't burn completely, they are released into the air.
- 720 tons of carbon monoxide. Carbon monoxide (CO) is a poisonous gas
- 125,000 tons of ash and 193,000 tons of sludge from the smokestack scrubber. A scrubber uses powdered limestone and water to remove pollution from the plant's exhaust. Instead of going into the air, the pollution goes into a landfill or into products like cement and bricks. This ash and sludge consists of coal ash, limestone, and many pollutants, such as toxic metals like lead and mercury.
- 225 pounds of arsenic, 114 pounds of lead, 4 pounds of cadmium, and many other toxic heavy metals.
- Trace elements of uranium. All but 16 of the 92 naturally occurring elements have been detected in coal, mostly as trace elements below 0.1 percent (1,000 parts per million, or ppm). A study by Department of Energy USA has found that radioactive emissions from coal combustion are greater than those from nuclear power production.

Import of Pollution along with Coal

Since Sri Lanka has no coal at all, we will be importing all these pollutants along with the coal. We can be sure that none of these will be exported, even if we dream of exporting energy to India. All of these will accumulate over the years in the Sri Lankan environment causing untold damage. When we have clear alternatives to ensure our energy why should we take such risks, particularly when the much published cost advantage is seen to be a false promise.

Both Norochcholai and Sampur projects are expected to have gone through the EIA process and thereby environmental mitigation measures should be in place. However it is impossible to obtain any information as to whether such measures are being pursued and the present status at Norochcholai. What is more important to recognize is that the world has now better understood the environmental dangers and the emission standards have been tightened the world over with the USA introducing additional components to be controlled as noted below.

I will be most surprised if any of the above pollutants have been considered in the EIA report at least for for Sampur. Our ignorance or ostrich attitude will not make them go away.

Long Term Energy Security

The Sampur coal power plant is only one of many proposed by the Long Term generation plan 2013-2032. If such plans are allowed to proceed we will depend on coal for more than 77% of the power generation capacity by year 2025. How does this impact on the future energy security of the country? Late Vidya Jothi Dr Ray Wijewardene always recommended that every country should not be dependent on external sources for its Food, Education, Health and Energy. We do have the potential for achieving non dependence in all these sectors.

Mismatch of Reported Policy Statements and Planned Actions

There is a curious mismatch between the various policy statements made by successive governments and the action taken by the energy authorities. The previous government had a short term target of 20% of Non Conventional Renewable Energy (NCRE) integration to the national grid by 2020 and further qualitative assurances of development of the indigenous sources of energy to the maximum. However, the commissioning of the second stage of the Norochcholai power plant was accelerated and the CEB is finding it impossible to run it any anywhere near full capacity.

The Manifesto of the present government is even more specific with intentions to "fulfill the basic energy requirements of the people through renewable energy sources such as wind solar biomass etc. and to install dendro power plants throughout the country" ...

The Ministry of Power and Energy published a ten year energy development plan recently, which has the most laudable goal to achieve 100% renewable energy (not limited to electricity) by 2030.. Sri Lanka is ideally placed to achieve this goal even earlier.

However, the CEB long term generation plan has provided for only 12% penetration by NCRE by 2020 and is silent on the years there after. In the meanwhile plans are moving apace to install the Sampur Coal power plant. The public is at a loss as to what to believe.

It is hoped that sanity will prevail and even at this late stage the plans to commission the Sampur coal power plant is halted. The government of India can be requested to help us develop our wind and solar resources, instead of pushing this white (black?) elephant down our throats, as they are now a world leader in both these technologies. I would like to appeal to my fellow engineers and other professionals to take a closer look at this problem as the issues are quite transparent even though the decision making process is not.

I am grateful to Mr K Gnanalingam, a former DGM of the CEB, Dr Anil Cabraal, Retired Energy Expert of the World Bank, Dr Janaka Ratnasiri, renowned scientist and energy expert who have provided much of the data and insights that have been expressed in this article. I will be happy to share the sources and publications used with anyone interested. I am

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(Concluded).