Power crisis - The Institution of Engineers' view

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Coal - the most cost effective long-term option

The Institution of Engineers, Sri Lanka, representing the interests of almost seven thousand members, is of the view that there is an immediate need for a long term solution to the current power crisis.

In spelling out the need, the IESL is of the considered opinion that a firm long term Plan needs to be implemented immediately and the medium and short term plans should dovetail into the long term plan. These plans should be with the objective of obtaining the most cost effective electricity over the long term at the very earliest.

The impacts of the non-implementation of the long term Plan are:

1. Extensive power cuts
2. Exceptionally high increase in tariffs, where domestic tariffs would rise between 25 and 119 per cent, industrial unit charges between 58 to 68 per cent and industrial demand charges between 37 and 48 per cent, and
3. Negative impacts on the economy.

The costs of the non-implementation of the long term Plan are best detailed graphically as in the chart shown here which demonstrates how and why the tariffs would increase if a decision is NOT taken now.

Projected power requirements

The chart below (CEB Generation Plan 2001) demonstrates the increase of power requirements from 2001 to 2021. The country's power requirements will increase by 3300 MW between now and 2021 (CEB Generation Plan 2001). This is equivalent to three major (900 MW) coal power plants plus the balance coming from other thermal sources, hydro and renewables.

In the immediate future between 2001 and 2008, 868 mega watts must be added to the national grid.

Fuel options

The options available and comparative costs, (see graph) calculated as specific life-cycle costs, that is in rupees per kilowatt hour, are under Rupees four for Puttalam coal, just under six rupees for oil/steam, diesel furnace oil and combined-cycle diesel and approximately Rupees seven seventy for gas turbine diesel generated electricity. These costs incorporate capacity cost, fuel cost and maintenance cost in the cost computation.

In the First Quarter of 2000, the imported cost of coal in both Japan and the European Union were below 40 US dollars per metric tonne. In the World Projections of fuel for electricity generation between 1971 and 2020, coal, oil, gas, nuclear, hydro and other renewables were listed showing that, by far, the most cost-effective source of fuel over the long term, per kilo watt hour, was COAL.*

Thus coal is clearly the most cost effective long-term option for thermal power generation.

Where and when?

Now, two questions arise: Where and when for the Coal Powered Plants?

The options available to us at this time are:

1. Mawella
2. Hambantota
3. Trincomalee, and
4. Norochcholai

In the current context, ALL are required, but which one first?

Mawella

1. Site selection study completed in 1988
2. Preliminary studies completed in 1990
3. Requires about 300 families to be relocated
4. Requires part of the lagoon to be reclaimed
5. Mawella is famous for its marine blowhole which is a tourist attraction
6. Mawella has been declared an environmentally sensitive zone since the original studies
7. ElectroWatt rating for environment was "Double Negative"

Hambantota

1. This location is still in the CONCEPTUAL stage
2. The same area has been identified for the development of a commercial port and power plant
3. Current options are to build the port first because of the high investment and the time factor and then build the power plant
4. Question is: Is there enough time to find the finance and build the power plant?

Trincomalee

1. Feasibility study was done in 1988
2. This may require a review in current context
3. Time required to design, produce bankable documents and Environmental Impact Assessment plus call for tenders and award contracts is estimated to be four years PLUS four years for completion of construction
4. Then, the all-important question of money to finance this project, and, finally
5. The Mihaly experience of not being able to raise the necessary money to finance the Project

Norochcholai

1. Bankable documents are ready and available NOW
2. Environmental Impact Assessment approvals have been obtained
3. It would take only two years to invite and award tenders and commence construction plus four years to commission the Plant
4. The original consultant's report has been reviewed and concurred with by a second consultant (Ramboll) in respect of ALL objections to the EIA

In a comparison of timing for coal plants (ref table and graph above) at these sites, Norochcholai could be commissioned the earliest (6 years) followed by Trincomalee (8 years) and Hambantota (11 years). The need to implement a long term plan leading to a reliable and cost effective availability of electricity cannot be stressed too strongly. The country needs 3332 MW by 2021 i.e. a minimum of three 900 MW plants.

To meet this need of capacity and timing Norochcholai should be commenced immediately and this followed by Trincomalee and then Hambantota. With this sequence it would be possible to have the three plants commissioned by 2021.

It must be noted that the CEB's Demand Projections have not taken into account the impacts of the Peace Process. If the requirements of the North and East are also considered in the context of the current peace process the power requirements would increase further necessitating further increases in generation requirements.

The CONCERNS expressed regarding Norochcholai are:

1. The site is not technically feasible
2. The Catholic Bishop of Chilaw has objected
3. There are environmental concerns
4. The costs have been grossly underestimated
5. Coal supplies may be uncertain in the future thus making the Plant redundant

Let us deal with these 'Concerns' one by one:

Site not 'technically feasible'

1. Internationally recognized and accepted consultants commissioned by government came to the conclusion that the site was technically feasible
2. The concerns expressed by both organizations and individuals were reexamined by government who appointed the Danish consulting firm, Ramboll, which went over the entire project and concurred with the original recommendations
3. Ramboll preferred the barge alternative originally proposed due to economy of cost, flexibility and the security concerns about a 4.2 kilometre jetty, and, finally
4. The Plan developed by the CEB's consultants has been subject to professional review by several expert groups at various stages and has been accepted as eminently feasible

Barge loading and unloading

1. Drummond Coal, Colombia: 12 million tonnes per annum using 2,000 tonne barges unloading from offshore from Cape-size vessel
2. Carbones del Guasare, Venezuela: six million tonnes per annum using 2,000 tonne barges unloading from offshore from Panamax-size vessel, and
3. Predeco Coal, Colombia: Three million tonnes per annum using 2,000 tonne barges unloading from offshore from Panamax and Cape-size vessels
4. Port of Antwerp, Belgium: Six to eight million tonnes per annum being discharged from Cape-sized vessels into 2,000 tonne barges
5. Hazira Port, near Mumbai (Bombay), India: Six million tonnes per annum of iron or and one million tonnes of coal from Cape-size vessels discharging into barges with the use of floating cranes.
6. Similar operations have been under way unloading coal in the ports of Amsterdam and Rotterdam in the Netherlands.

Opposition by the Bishop of Chilaw

* The Bishop's Letter of 21st September, 2001 states: "It is up to the Government to proceed from here. Whatever the course of action it takes that would be on its own responsibility."

Environmental concerns

1. The EIA was approved by a number of agencies in accordance with the provisions of the Environment Act.
2. The Danish Ramboll report states: "The Provincial Environmental Authority definitely possesses the experience and attitude to carry out the monitoring task at a proper international level."

Cost grossly underestimated

1. These concerns may be based on a reconnaissance report by JCI
2. They are based on 1992 investment estimates, and
3. Since 1992, the capital cost of coal plants have declined significantly

Private developer

We wish to express our own concerns of utilizing private developers for a project of this importance and magnitude. Private developers are usually preferred in the belief that they are able to expedite work and raise the required funds expeditiously.

However, recent experiences have shown this to be otherwise -

1. The Mihaly experience - failed to raise adequate financing and the company was unable to meet Letter-of-Intent conditions for three years from 1992 through 1995
2. The KHD 40 MW Sapugaskanda plant took five years of negotiation between 1992 and 1997
3. The Colombo Power barge-mounted 60 MW plant took two to three years of negotiations to be finalized, and
4. The AES 150 MW Plant took from 1995 to 2000 for its pre-construction phase only, and
5. Government was compelled by circumstances to provide special guarantees

Thus our recommendation is that the first plant is erected by the state and once the pressure is taken off and the concept of private developers has been fine tuned entrust future projects to the private sector.

This brings us to our CONCLUSION of this presentation and a summation of what, precisely, must be done NOW: In conclusion we most strongly recommend for reasons set out above, that:

1. There should be an IMMEDIATE decision to build Norochcholai. If that is done, the Plant should be ready by 2008
2. It should be followed IMMEDIATELY by Trincomalee and then, Hambantota, in sequence, and
3. All THREE and more are required at the earliest to provide AFFORDABLE electricity.

The FUTURE of Sri Lanka is at stake. Without ADEQUATE power, the entire process of development and modernization slows down and comes to an abrupt stop. Sri Lanka cannot ATTRACT much needed foreign INVESTMENT or the dollar-spending tourists without a continuous and reliable power supply.

The PROSPERITY of the country depends on export-led growth, on the competitiveness of our goods and services in the world market, on the functioning of Colombo as a HUB port in the Indian Ocean Region. This is the only way the PROSPERITY could be created, jobs provided, incomes raised, and social stability ensured.

Without POWER, there's nothing except a slide back into the past from which Sri Lankans are trying to emerge. POWER is the backbone of our infrastructure. That essential infrastructure could only be provided if DECISIONS are taken NOW to create and consolidate our common future.

(The above submission was delivered to Her Excellency, the President, the Hon. Prime Minister and to every Minister of full Cabinet rank by the Institution of Engineers, Sri Lanka, acting pro bono publico and in the best interests of engineering professionals throughout the country which it represents).