Revitalising the electricity supply industry and making it accountable

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The ESI (Electricity Supply Industry) is known as "the industry of industries" because it is vital to all industries. Our national supply is neither adequate nor reliable so it needs must be improved upon.

The ESI here was set up over a hundred years ago, before many an affluent country had one. Yet now, our per capita consumption is one eighth that of Malaysia a developing country, and only 45% of our homes have a supply.

Many believe that the state of our ESI is an aspect of under development and nothing can be done about it. This article stems from the contrary belief, that much can be done by harnessing the talent of our people and our resources.

The Adequacy of Supply

The 1996 Power Crisis was a sharp reminder to the nation of its over-dependence on hydro power. Yet the CEB failed to impress upon the public that the shortfall was due to the seasonal nature of our rainfall and could only really be coped with by building a base load coal fired plant, as had been recommended in the late 1970s by the designers of the Mahaweli Hydro Complex (MHC).

Not surprisingly therefore, the nation's energies continue to be expended upon such hydro projects as Samanalawewa, Kukule and Upper Kotmale. The cost of each hydro is as much as that of a 300 MW coal plant, yet all of them put together could not generate as much energy as one 300 MW coal plant would. Thus it is time for those in authority to realize that our funds and our energies need to be focused on base load thermal generation if we are ever to free ourselves from power cuts.

The 1996 Power Crisis forced the CEB into purchasing power from the private sector virtually at any price - Rs. 6.25 from Bulk Supply Consumers and about Rs 12.00 from private generators - and selling it to the public at about Rs 4.00 per unit. This induced the government to initiate its current policy, that all thermal generating facilities are to be set up on a BOO basis.

But since 1996 only two such plants have come into operation. The Medium Term Thermal BOO Project which Her Excellency the President announced in this regard, has now been limited to just two 20 MW facilities, and the bids received - more than a year ago - are still under evaluation by the Ministry. The CEB is however, said to be negotiating a PPA (Power Purchase Agreement) for a 150 MW Combined Cycle Plant.

Between 1984, when the last thermal plant was commissioned and 1998 only the following plant, have been commissioned:

24 MW	diesels	Lakdhanavi
105 MW	gas turbine	CEB
51 MW	diesels	Asia Power
40 MW	diesels	CEB

This totals to less than the 300 MW (of coal plant) recommended for commissioning by 1992.

The Power Crisis of 1996 was the seventh since 1980, so it would be fair to say that unless a more vigorous policy of commissioning thermal plant is adopted, "it will be good luck and not good management" that will save us from repeated power crises in the future.

System Losses

The 1985 Master Plan (MP), prepared by the CEB and its Consultants, recognized the need to drastically reduce the system losses which stood at about 22%. Now the losses are less in percentage, but about 500 Gwh could be saved, boosting the annual CEB revenue by rupees 2 billion at present prices.

System losses arise from inadequacies in the transmission and distribution systems. The transmission system is not adequate for the ready transfer of energy, from the hydro plant in the central hills and the thermal plant in and around Colombo, to consumers in the four corners of the country. Extending the transmission system and reconfiguring the primary (33 kV and 11 kV) and secondary (400/230 volt) distribution systems will help reduce the losses and improve the quality and reliability of supply.

The Quality and Reliability of Supply

A reasonably good supply is one that is not subject to frequent interruptions, and noticeable fluctuations of voltage. The regular complaints about supply in the media show that consumers are far from happy about the quality or reliability of the supply provided to them.

Power cuts are the least welcome of interruptions - the interval of years between such cuts helps consumers forget the aggravation they felt, though. The bulk of the interruptions and voltage fluctuations are the result of shortcomings of the transmission and distribution systems. Thus improving these systems is the only way of enhancing the reliability and quality of supply to consumers.

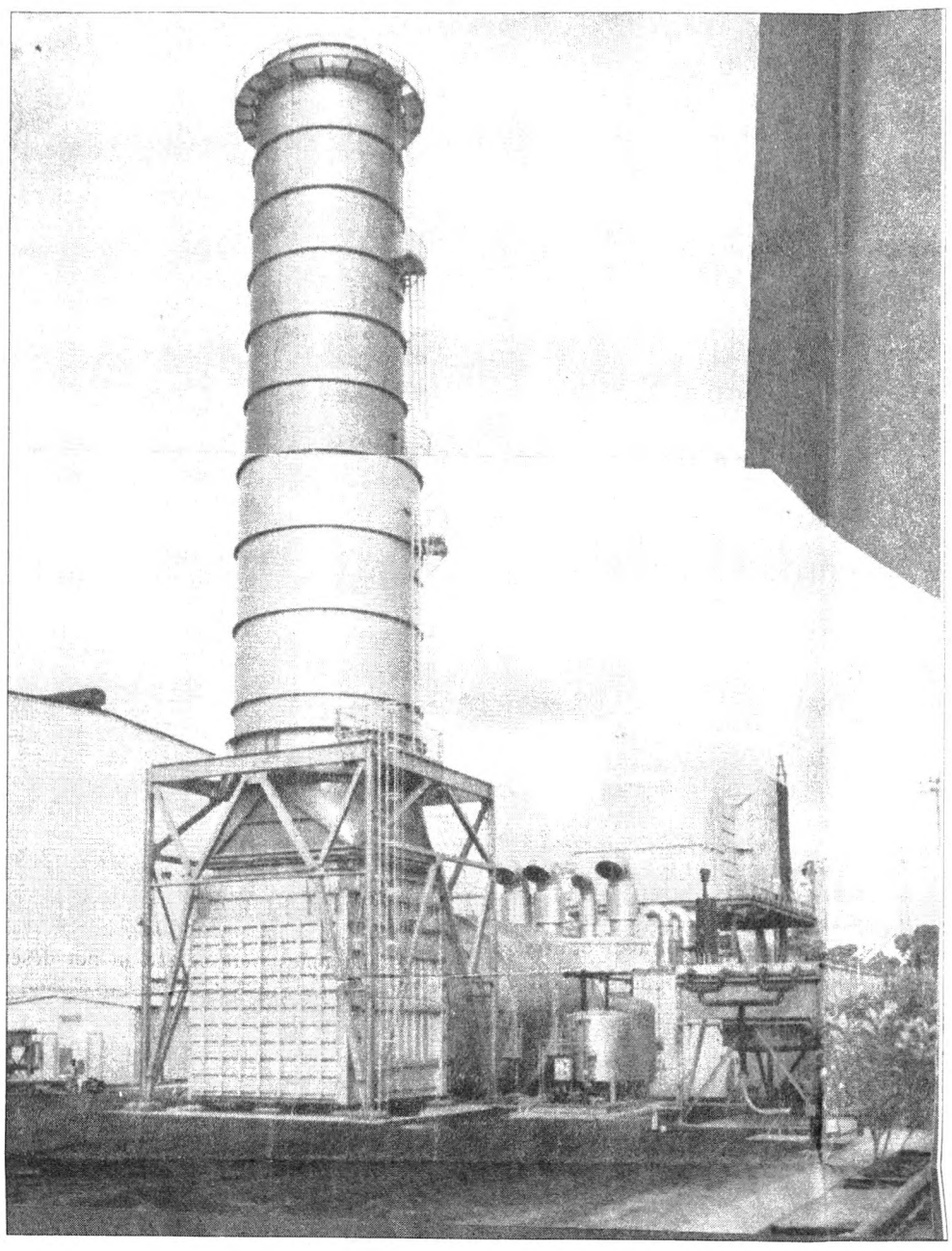
The CEB was created by an Act of Parliament in 1969. It was to be the national supply authority - concerned with generation and transmission, for at that time distribution was largely in the hands of local authority licensees functioning under the Electricity Act (EA).

The Structure of the ESI

By about 1980 the government found that local supply authorities were not paying their energy bills thereby placing the CEB in financial difficulties. So it set up LECO and registered it as a private sector organization under Company Law. The shareholders of LECO were the CEB and local authority licensees whose supply systems were taken over or handed in to LECO.

The situation today is that the CEB is the national supply authority solely responsible for generation and transmission, sharing distribution with LECO.

The CEB Act set up an autonomous Board, vested it with all the powers needed for carrying out its duties without reference to anyone or any body outside, and importantly made it accountable for the proper carrying out of its duties. But, over the years the Board's powers have largely been ferreted out to various officials and bureaucratic bodies by administrative dictats. The Board has thus ceased to be accountable for the state of the CEB, and no one else seems to be answerable either. In fact LECO has greater autonomy and is accountable!



The 1996 power crisis was a sharp reminder to the nation of its overdependence on hydro power. Yet the CEB failed to impress upon the public that the shortfall was due to the seasonal nature of our rainfall and could only really be coped with by building a baseload coal fired plant, as had been recommended in the late 1970s by the designers of the Mahaweli Hydro Complex (MHC).

Augmenting Thermal Generation

Currently the BOO thermal plant that the CEB hopes to get set up are either diesels or combined cycle. These plant are operated on furnace or heavy diesel fuel, not generally available outside Colombo. The combined cycle plant are large and the limitations of the transmission system make it necessary to set them up close to Colombo. The diesel plant envisaged in the Medium Term Plan has the great merit of not only by-passing the constraints of the transmission system but also of helping augmenting that system. So an expanded Medium Term Plan along with a rolling plan for building a National Grid needs to be carried out if we are ever to extricate ourselves from the existing situation.

Creating a National Grid and Improving Distribution

The British Super Grid was designed to serve the nation for fifty years. Parts of it are nearly fifty years old. Now it is thought that these lines could be made to serve the nation another fifty!

The first transmission line built in this country was at 66 kV. The 66 kV system was outmoded by the time they were built. The next lot of lines built shortly thereafter was at 132 kV.

Then, reportedly on the basis of outputs from the largest computer in the world and the advice of someone in the World Bank, that all we needed were 220 kV lines which would serve us for 15 years, we are in a similar, if not worse situation - for the 15 years are almost up and we are continuing to build more 220 kV lines. Might one ask therefore, "what next?"

The number of lightning days per year, the frequency of strikes on such days, and the intensity of strikes in this country are among the very highest in the world. Only lines at 400 kV can cope with such a situation. Besides such lines have a high load capability, better voltage regulation over greater distances, and are cheaper per megawatt delivered than 220 kV lines. Before long, we will have to deploy them. Let us not continue adding 220 kV lines which will only serve us in the short term.

Our primary distribution systems - 33 kV and 11 kV - are part of our colonial heritage. Over the last four decades 22 kV systems have been replacing both 33 kV and 11 kV, because they hardly cost any more than 11 kV but have double their load capability and are therefore very economical. We however seem oblivious to this development and are adding new 11 kV cables and switchgear to the seventy year old ones in Colombo, and have just replaced the 33 kV and 11 kV systems in Kandy loosing the opportunity of replacing both these systems with 22 kV at a lower capital cost.

In the affluent world most primary and secondary distribution systems are constructed on wood poles. In parts of the world where lightning is severe such as in Florida, Ecuador, Australia, etc. wood poles are the exclusive or preferred form of support. Here we use concrete poles and import wood poles for use in terrain where concrete poles cannot be transported to.

In the mid 1980s the ISL (Institution of Engineers Sri Lanka) sought to get the use of wood poles boosted by having seminars, and a short while later the SLSI (Sri Lanka Standards Institution) issued a set of detailed standards on selection, processing, treating and deploying wood poles. There are enough wood poles for our use here, but nothing has resulted.

The CEB's current investment annually in transmission and distribution projects is about 13 billion rupees, half of which the CEB meets. The other half is funded - World Bank or Asian Development Bank - and this brings in its wake conditions of implementation.

Transmission Projects are now contracted out on a turnkey basis. This is wasteful of both time and money. If towers are standardized, designed and fabricated locally, and the insulators and conductors purchased on tender, the work could be carried out locally cutting cost by about 30%. A similar economy could be effected by redesigning overhead lines and deploying locally grown wood poles. With such economies it would not be necessary to borrow money from outside.

Restructuring the ESI

Restructuring and privatizing the CEB does not seem to be a practicable or fruitful proposition in the present context. But revitalizing and commercializing the CEB should not be too difficult given the will - government and political.

When the CEB Act was formulated the total demand was probably about a tenth of what it is today. Further, the perception of what the Board was required to achieve was very limited. It was within such constraints and perceptions of the time that the membership of the Board was defined. Today the CEB is the largest and the most widely spread out organization in the country, the public expectations are a better service at lower costs, and engineering technology has so developed that no engineer has or can have an in depth knowledge of all the engineering relevant to the supply industry.

Unless and until the government restores to the Board its full statutory autonomy the Board is bound to remain an enfeebled and therefore inconsequential organ of the state. Further, the Board as constituted is not quite fitted for the present tasks of revitalizing the industry, and being accountable for accomplishing it duties. There is a need for more full time members - two for engineering, one for finance and one for employee relations.

The Chief Executive by virtue of the Act is the General Manager (GM). The appointment of a full time Chairman has tended to undermine that position of the GM. The functioning of the organization will only improve when the apex position of the GM is restored and he is made fully accountable for the proper execution of all work entailed.

A reconstituted Board with all its powers restored should not only be able to decide policy, it should be in a position to monitor how that policy is carried through, set the executive specific targets for achievement and develop ways and means for such achievement. It should be able to act in a transparent manner and be accountable.

Conclusion

The ESI has been in a parlous state for decades and now the impact of power cuts on the economy is measurable in billions of rupees. Understandably, this government and the previous one, have sought to restructure and privatize the ESI in an effort to develop the ESI in the national interest. These efforts have all stalled.

The CEB is central to that development, and there is much it could do if it is released from the ad hoc bureaucratic controls that, contrary to the provisions of the law, have been imposed upon it.

The composition of the Board was decided upon by the constraints and the perceptions of more than three decades ago. Changing it to meet the expectations of the consumers of today is a reasonable measure.

The nation expects a better ESI. It is for the government of the day to take the measures necessary to that end, for no one else can do that.