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Coal plant will not avert a power crisis in 2004

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(Continued from yesterday)

If LNG is transported to Japan and other Far-Eastern countries like Taiwan and Korea from the Middle East in special tankers, which have to sail empty in their return trip. LNG is also exported from SE-Asian countries Indonesia and Malaysia to many countries. In fact Indonesia is the largest exporter of LNG. It would be possible for a returning tanker to pick up a load from one of these countries and unload in Sri Lanka. If a LNG unloading facility is developed in Galle, the ships do not have to deviate much, and Sri Lanka would be able to get its supplies at a very competitive price. It is therefore important to negotiate with LNG suppliers and obtain a firm price rather than speculate values as done above, which may not be realistic.

Life cycle cost

To determine the life cycle cost, it is necessary to know the overall thermal efficiency of the plant. The value assumed by Dr. TS is 47.5%. With the new generation of CCGT plants with factory measured efficiencies more than 56%, it should be possible to get at least 50% efficiency under tropical field conditions. This again is something to be verified from the Suppliers. Another discrepant value is the calorific value of coal, which has been taken as 6,670 kcal/kg by Dr. TS. This is 10% higher than the design value of 6,050 kcal/kg given in the EIA report. The values quoted in international literature for Australian coal is even less. Once the above figures are revised, the life cycle cost of generating electricity from NG fired CCGT should be much less than US cts 5.70/kWh worked out by Dr. TS, thus reducing the gap between the cost of NG generated electricity and coal generated electricity.

In a paper presented by E. A. S. Sarma, Secretary to the Ministry of Power in India and two others at a meeting of the World Energy Council in September, 1998, the life cycle costs of generating one unit of electricity from coal and natural gas have been worked out as US cts 6.433 and 6.475, respectively. Both figures are higher than Dr. TS's values. This again shows the variability of the results as they depend on many uncertain factors. It may be noted that despite the fact that in India coal is obtained from domestic sources and natural gas imported from the Middle East, the two cost factors are comparable with each other and that NG is competitive with coal. It may be mentioned that India despite having adequate domestic coal supplies, is planning to import LNG to feed power plants, transport and industries in a big way.

Safety Aspects

Some coal power proponents have been giving misinformation regarding safety of using NG for power generation. In an article in The Island of 06.10.99, a writer says that LNG import will entail the taking of greater precautions than with oil installations because of the risk of explosion. In the last 40 years of LNG transport, no fatal accident has been reported anywhere in the world. NG constitutes mainly methane, a gas lighter than air. Therefore, even if it leaks, it will not stay near ground level. NG itself is odorless and colourless, and hence, trace amounts of sulphur containing deodorants are added for easy leak detection to prevent losses.

The auto-ignition temperature of NG is 538oC at atmospheric pressure, and the flammability limits of air to gas ratio lies in the range 5-15 % by volume, which is higher than that for gasoline. Hence, it is much safer to handle than liquid fuel. It was only a few weeks ago that 3 members of a family in Moratuwa died of an explosion caused by a leaking LPG cooker (Sunday Times of 26.03.2000). Since LPG was introduced to Sri Lanka, there have been many more fatal accidents. Yet, we continue to use LPG in the kitchen, in motor cars and build large storage tank complexes. It can be definitely said that NG is much safer to handle than LPG or gasoline.

Natural gas supplies

Another misinformation given about NG is that its supply sources are remote and it is expensive to store and transport (Daily News of 28.03.2000). This is far from true. The truth is that NG sources are closer to home than low sulphur coal. The world's largest exporter of LNG is Indonesia, while other countries in Asia like Malaysia, Brunei and the Middle East supply a major share of world requirements. In fact, Indonesia and Malaysia jointly supply almost 50% of total global exports. Bangladesh has also found large deposits, but is not extracting them yet.

On the other hand, low sulphur coal has to be imported from either Australia or South Africa. The coal has to be unloaded to jetties built 4 km from the shore at the proposed site, which is also an expensive operation. As mentioned elsewhere, we should not make decisions based on speculations or figures taken off the air. A statement that LNG is more expensive to import than coal has to be based on firm quotations obtained from potential suppliers who are already in the business of supplying LNG to the world market.

Offer from Enron

In his article in Daily News of 06.09.99, Dr. TS has wanted to know of an Investor willing to set up a NG plant here picking the additional cost himself in exchange for carbon trading. I later came to know that a potential investor has indeed met the officials of the Ministry of Irrigation and Power and the CEB and has offered to carry out a feasibility study on introducing LNG to Sri Lanka. However, it was not for complicated carbon trading, but for a simple business proposition. That was Enron who is currently setting up a 2,450 MW NG fired CCGT plant at Dhabol near Mumbai in India. They have indicated that they could bring in LNG to Sri Lanka to operate a CCGT plant at a cost competitive with CPP operation, provided the cost of port development is shared with other users. However, the Ministry or the CEB does not appear to have accepted this offer.

As mentioned earlier, Enron has word-wide operations in supplying LNG for power plants and industries. In the Indian project, Enron plans to bring LNG from the ME and SE Asia, and after supplying the power plant, distribute additional gas in pipelines to industrials and commercial users in the western region of India. Sri Lanka's strategic position being lying between ME suppliers and SE Asia suppliers could be exploited to our advantage to obtain NG supplies at a very competitive price. Knowing this only Enron has made this offer to the Government of Sri Lanka. With their world-wide experience, if they say that LNG power generation could be feasible in Sri Lanka at this stage, the Ministry and CEB should have taken them seriously.

If, on the other hand, the current procedures prevent acceptance of unsolicited proposals for power development, the CEB should have by now invited proposals openly from potential suppliers for a package to supply a NG fired CCGT, arrange for the supply of LNG and install the necessary port facilities. I have said this in my article in Daily News of 12.10.1999 too. It would have given opportunities for other power developers to express interest in the project and also for the CEB to assess the feasibility of introducing LNG to the country, based on firm quotations from prequalified suppliers. Since the port development has many uncertainties and is site specific, that component could be left for the Government to be undertaken as part of the general development plan of the port. It is unfortunate that with an impasse in hand on the CPP, the CEB is just waiting without taking any meaningful measures for initiating such alternative options.

Coal supply and demand

The main argument of coal power proponents is that it is cheap and the prices are stable, compared to that of petroleum oil or natural gas. According to the basic economics theory, the price of a commodity depends on the supply and the demand. If the price is low, it means that either the supply is in surplus or the demand is low. No producer is going to sell coal at a price lower than what it could fetch in the global market. If they do sell cheap, it is obvious that there is no demand for it for good reasons. Historically, coal was the preferred fuel for electricity generation simply because it was available in abundance and the technology for utilizing it irrespective of environmental impacts was known. Naturally coal is the major fuel for electricity generation world-wide at present. But, that is no reason why Sri Lanka should go for it at this stage.

The future trend, however, is to switch from coal to natural gas because of the adverse environmental impacts of coal, both on the local environment and the global. Though there are clean coal technologies being developed to minimize the emission of pollutants affecting the local environment, they are expensive and more suited for small and medium scale plants. Also, such technologies create other environmental problems. For example, the fluidized bed technology developed to capture sulphur dioxide requires a continuos supply of lime to precipitate sulphur as calcium sulphate or sulphite. Though theoretically, one molar weight of lime is required to remove one molar weight of sulphur, to make the conversion efficient and fast, nearly double that amount is required in practice. In a country with limited supplies of lime, like Sri Lanka, it would not be possible to utilize such technologies.

Transport and Industrial Sectors

One important advantage of NG is that it could be used as a fuel in the transport and industry sectors as well, unlike in the case of coal which can be used for electricity only. The air pollution from diesel vehicles is getting worse day by day. Though regulations have been gazetted to control emission of smoke, its implementation is not easy as the motor mechanics are not in a position to rectify the problem and also such repairs are expensive (see the writer's article on 'Story of Smokemeters' in the Island of 29.10.99). Hence, an effective solution for this problem is to switch from diesel to compressed natural gas (CNG) to operate heavy vehicles as done in many European and Asian countries. In India, heavy vehicles are retrofitted with devices that would permit dual operation, that is to be able to operate with either diesel as in the original version or with CNG. When using CNG, a small percentage of diesel is required to cause ignition of the fuel mixture.

The Government is planning to set up a large number of industrial estates to promote industrial growth. Industries need clean source of energy. At present many industries use LPG delivered in special carriers. A pipe network could feed all these industrial estates with NG. If Galle is selected as the point of import, this pipe network could radiate both northwards and eastwards, to supply NG for power generation, vehicle operation and to feed industries. The cost of setting up this infrastructure should not be added to the electricity consumer, but absorbed by the Government itself, as any other infrastructure development cost. The Government in formulating master plans on industrialisation and transport should consider the clean fuel options necessary to keep the industries and vehicles moving.

Port facilities for LNG import

The import of LNG requires port facilities with a minimum depth of 14 m to berth 135,000 m3 capacity tankers. In addition, insulated storage tanks to hold the liquefied gas discharged from the tankers have to be built on adjacent land. This requires the construction of special berths and jetties. The liquid is discharged using rigid piping arms from the tankers direct into the storage tank. Hence, it is necessary that this operation is carried out in calm waters, protected by a breakwater. The liquid is then regasified by bringing it closer to ambient temperature and sent out by pipeline in gaseous state to end-users.

According to recent media reports, the SL Ports Authority has earned over a Rs 5.0 billion profit in 1999 (Daily News of 17.03.2000). The SLPA has already made plans to construct a new berth to dock 8,000 dwt ships in Galle Port at a cost of Rs 525 million. In addition, feasibility studies to construct two multi-purpose berths 12 m deep at Galle Port, to be undertaken with Japanese assistance, have already commenced (Daily News of 30.03.2000). Therefore the SLPA should be in a position to include the development of the Galle Port to accommodate LNG tankers and allocate land to construct the storage and regasification facilities, as part of its own development programme. If the extra 2 m Dredging and construction is undertaken as a part of on-going activities, the costs could be kept to a minimum. It is essential therefore that SLPA is advised on this important national need, before they finalize their studies. If the CEB decides to have a LNG plant in 10 years time as quoted by its Chairman in the Daily News article referred to above, the SLPA has to act now. If the Government develops the port for berthing LNG tankers at its own expense, it would be an incentive for the power developers to invest on the rest of the infrastructure and power plants.

Continued tomorrow