

OVERVIEW OF SRI LANKA'S ENERGY SUPPLY AND COSTS: PAST, PRESENT AND FUTURE

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Summary: Sri Lanka's energy supply is characterised by an increasing dependence on imported commercial forms of energy, and a substantial increase of energy prices in real terms. The petroleum customers are burdened with the increases in international oil prices together with Government taxation. Electricity customers are burdened with high tariffs, poor availability and poor reliability.

Energy Supply

Figure 1 shows the past and present shares of the three forms of energy supplied in Sri Lanka, compared at the primary level. Only 50% of primary energy requirements are met with commercial forms of energy: petroleum and hydroelectricity.

Resulting from lower growth rates in biomass supply (and demand), and higher growth rates in the demand for petroleum products and electricity, Sri Lanka's energy supply is now predominantly commercial. Therefore, supply constraints in commercial energy, petroleum and electricity, will be of increasing concern and the economic impacts of their non-availability or limited availability, are expected to be proportionately higher.

Supply Constraints: Electricity

Considering the recent past, constraints to the electricity supply experienced by all customers, especially the industrial and commercial customers, are explained in Table 1.

Figure 1- Primary Energy Supply

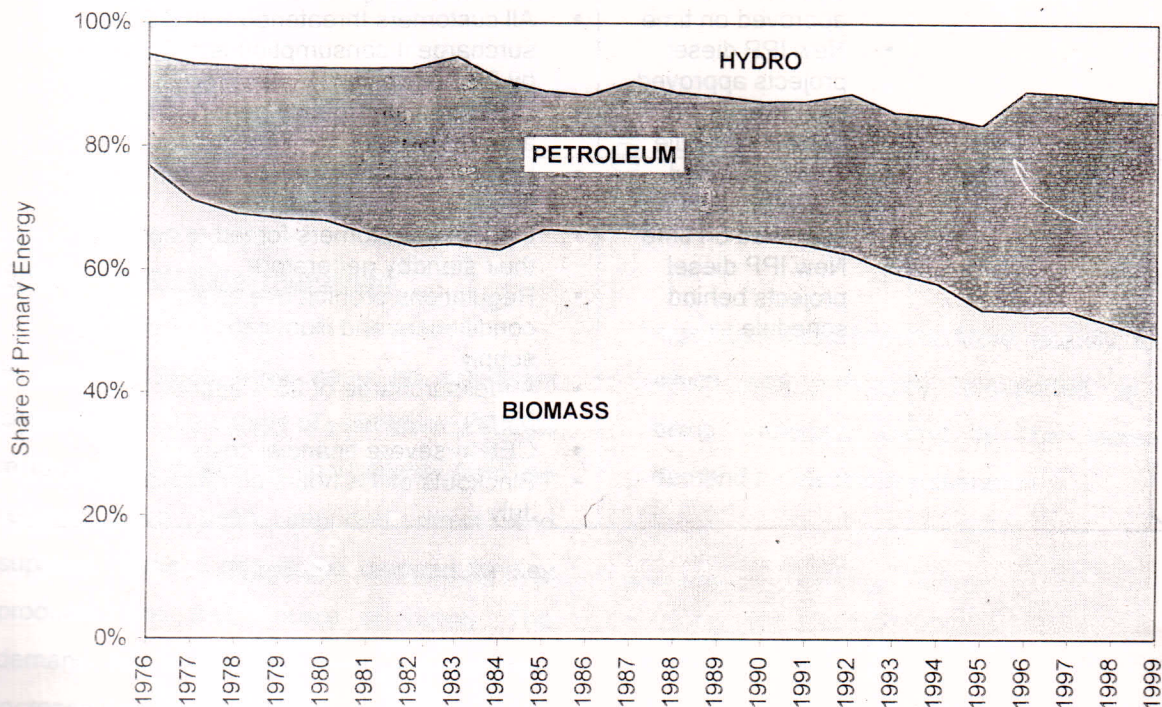


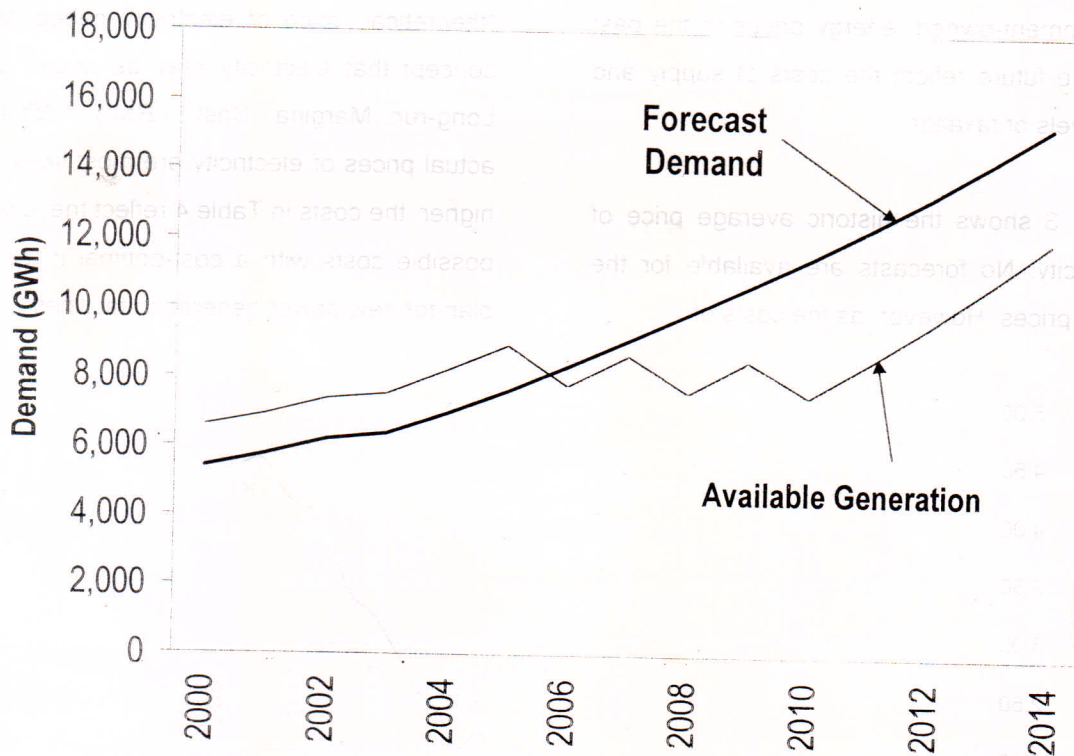
Table 1- Constraints in Electricity Supply

Year	Status of supply	Cause	Consequences
1994	Crisis	<ul style="list-style-type: none"> ▪ Sapugaskanda Plant Extension not approved 	<ul style="list-style-type: none"> ▪ Unofficial blackouts in July. ▪ Industrial customers urged to operate their standby generators. ▪ 6% above-average rains in late July brings temporary relief.
1995	Minor Crisis	-do-	<ul style="list-style-type: none"> ▪ Industrial customers urged to operate their standby generators. ▪ No blackouts owing to 17% above-average rainfall.
1996	Major Crisis	<ul style="list-style-type: none"> ▪ Sapugaskanda Plant Extension not approved <i>on time</i> 	<ul style="list-style-type: none"> ▪ Major 8-hour blackouts March-September ▪ Industrial customers forced to operate their standby generators. ▪ Regulations prohibit use of air conditioners and illuminations from grid supply ▪ GDP growth dropped to 4%. ▪ CEB hired emergency generators run on auto-diesel
1997	Crisis	<ul style="list-style-type: none"> ▪ Sapugaskanda Plant Extension not approved <i>on time</i>. ▪ Gas turbine project not initiated on time 	<ul style="list-style-type: none"> ▪ Industrial customers forced to operate their standby generators. ▪ Hired emergency generators run on auto-diesel continue to operate
1998	Minor Crisis	<ul style="list-style-type: none"> ▪ New IPP diesel projects behind schedule 	<ul style="list-style-type: none"> ▪ Industrial customers forced to operate their standby generators. ▪ 2% above-average rainfall avoids power cuts
1999	Minor Crisis	<ul style="list-style-type: none"> ▪ New IPP diesel projects behind schedule 	<ul style="list-style-type: none"> ▪ Industrial customers forced to operate their standby generators. ▪ 8% above-average rainfall avoids power cuts
2000	Crisis	<ul style="list-style-type: none"> ▪ Two Combined Cycle projects not approved on time ▪ New IPP diesel projects approved, but three years behind schedule 	<ul style="list-style-type: none"> ▪ Industrial customers forced to operate their standby generators. ▪ All customers threatened with a 25% surcharge if consumption is not reduced by 20%. ▪ CEB hires emergency generators run on auto-diesel
2001	Major Crisis	<ul style="list-style-type: none"> ▪ Two Combined Cycle projects not approved on time ▪ New IPP diesel projects behind schedule 	<ul style="list-style-type: none"> ▪ Hired emergency generators run on auto-diesel continue to operate ▪ Industrial customers forced to operate their standby generators. ▪ Regulations prohibit use of air conditioners and illuminations from grid supply ▪ A fuel surcharge of 25% applied from 1st March ▪ CEB in severe financial crisis ▪ Blackouts of 1½ hours commenced on 2nd July

Owing to delays, cancellations and suspension of major power generation projects, the electricity supply is most likely to remain in crisis until at least the year 2007. This is the minimum time required to develop a large

baseload power plant, operating on cheaper fuels. Figure 2 shows that the electricity constraints in the supply system over the next fifteen years.

Figure 2- Electricity Demand and Supply Constraints in the Future



Supply Constraints: Petroleum

In general, there have been no significant constraints in the supply of petroleum products in the past. Products in short supply from the refinery have been imported direct and supplied. Table 2 shows the demand for key products, and their source of supply. The demand for diesel has seen a substantial increase throughout the past period, requiring

significant direct imports. More recently, fuel oil which was previously re-exported, is now being imported, owing to the increasing demand for electricity generation.

Table 2- Supply of Petroleum Products 1999

	LPG (000 MT)	GASO. (000 MT)	NAPHTHA (000 MT)	KEROSENE (000 MT)	AVTUR (000 MT)	DIESEL (000 MT)	FUEL OIL (000 MT)	RESIDUAL (000 MT)
DIRECT IMPORTS	126.66	29.60		15.66	252.12	880.23	135.80	
DIRECT EXPORTS			-84.61				-20.97	
FOREIGN BUNKERS					-98.06	-40.49	-191.74	
STOCK CHANGE	0.16	15.02	-14.74	60.17	-64.04	-9.63	8.86	30.04
PETROLEUM REFINERY	48.31	169.34	99.47	167.26	53.93	588.49	441.70	218.66
TOTAL REQUIREMENT	175.13	213.96	0.12	243.09	143.94	1418.59	373.66	248.70

Energy Prices: Electricity

As the electricity and petroleum utilities are independent commercial operations, though Government-owned, energy prices in the past and the future reflect the costs of supply and the levels of taxation.

Figure 3 shows the historic average price of electricity. No forecasts are available for the future prices. However, as the costs of

electricity generation is the main determinant of electricity prices, Table 5 shows the "theoretical" price of electricity based on the concept that electricity may be priced at the Long-run Marginal Cost (LRMC). While the actual prices of electricity are most likely to be higher, the costs in Table 4 reflect the lowest possible costs with a cost-optimal investment plan for new power generation facilities.

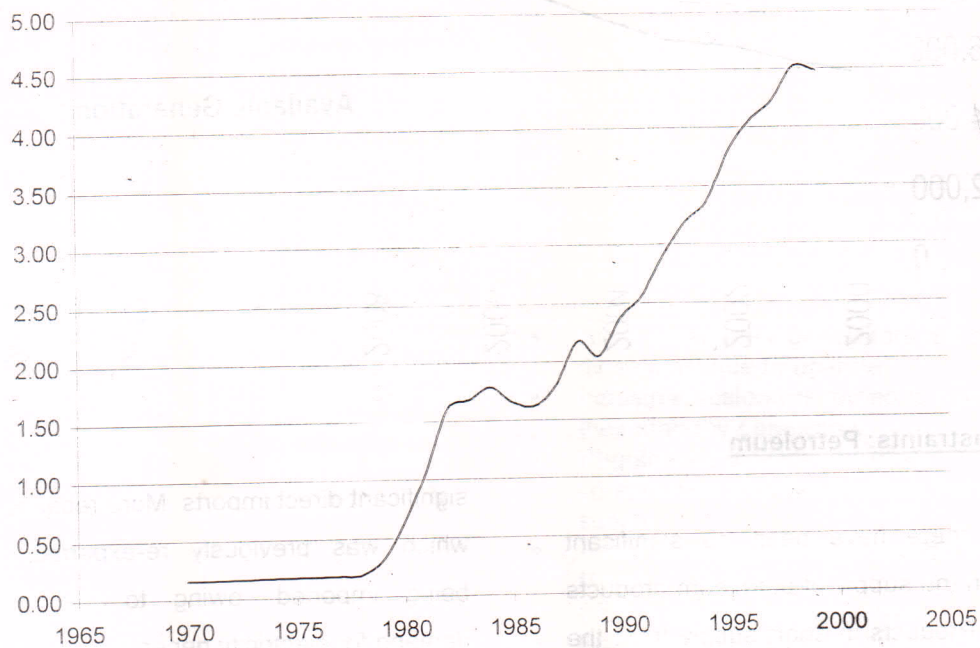


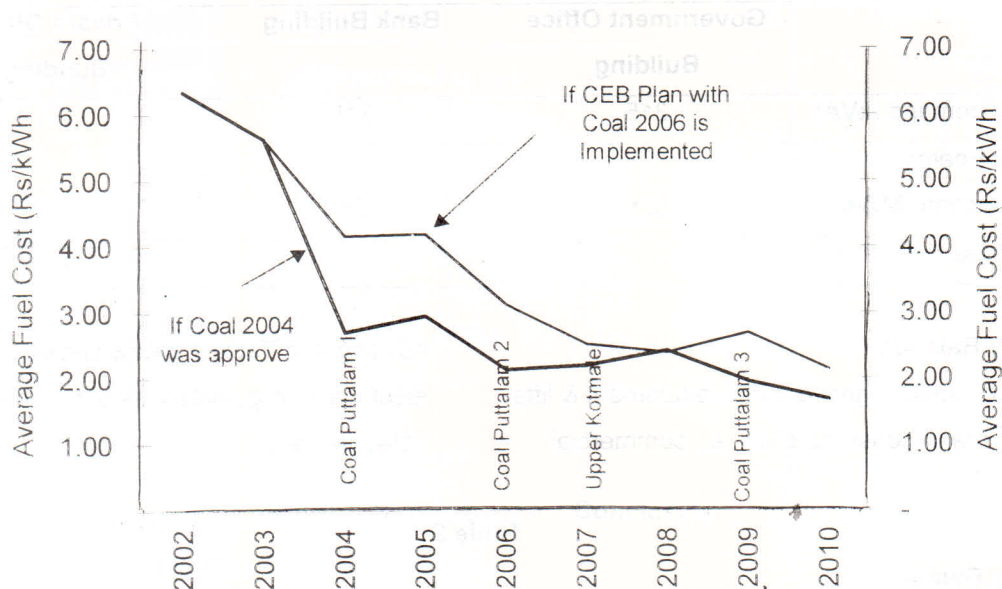
Figure 3- Historic Average Prices of Electricity (Rs/kWh)

Table 3- Long-run Marginal Costs (as at year 2001)

System Level	Generation	Transmission	Distribution	Total at each system level (Rs/kWh)
Gross Generation	4.93			4.93
Net Generation (ie. input to transmission)	4.98			4.98
End of transmission (ie. input to distribution and delivery to HV customers)	5.14	0.52		5.66
End of distribution (ie. delivered to MV/LV customers)	5.76	0.59	1.05	7.40

Figure 4 shows the operating costs of power plants, which is the main determinant of electricity prices.

Figure 4- Thermal Power Plant Operating Costs of CEB if Major Power Plants are Built on Time



Energy Prices: Petroleum

Petroleum prices are determined by the import prices of crude oil and refined products, and the taxes imposed by the Government. The policy of taxation does not reflect the needs of the petroleum subsector, to rebalance the product mix to enable optimal operation of refining and storage facilities.

Conclusions

It is inevitable that there will be serious shortages of electricity supply in the period until year 2006, even if decisions to build major power plants are taken immediately. In the

petroleum sector, availability of supply will be determined by the worldwide conditions, but no major constraints are expected.

Even if major power plants are built on time starting from now, the average price of electricity which is presently Rs 5.60 per kWh, is most likely to increase to at least Rs 7.40 per kWh. If cheaper generation technologies are not adopted, this price will be higher. Petroleum prices will continue to be determined by the world prices and the presently ad-hoc policy of taxation.