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1 INTRODUCTION TO THE ELECTRICITY INDUSTRY

Highlights: Sri Lanka serves grid electricity to about 80% of households, and a further estimated 3% of households use off-grid systems. About 40% of electrical energy is used in households, a further 40% in manufacturing industry and the balance is used in the commercial sector. Electricity generation has been in transition from a predominantly hydroelectric system to a mixed hydro-thermal system, presently dominated by oil. Nevertheless, over 40% of electricity demand continues to be met with conventional and non-conventional renewable energy sources. Demand for electricity has grown at an average rate of 6.7% over twenty years ending 2006, which has slowed down to 5% in 2007 and to 1.7% 2008. Owing to the high share of oil-fired electricity generation, the cost of electricity production has risen with the rising oil prices. Delays in adjusting the electricity prices to reflect the rising costs, have caused the state-owned electricity utility to report losses since 1999. The national average electricity price in 2007 was 10.72 LKR/kWh, and increased to about 15 LKR/kWh by mid-2008, and is estimated to be about 14 LKR/kWh at present (2009), making the prices to be among the highest in the region. Most households and industries pay below the average price, and are cross-subsidised by high-end households and commercial sector. Technical and commercial losses had risen to about 21% of generation by year 2000, which have now declined to about 15%. **Outlook:** The sector outlook is positive in the medium to long term, with the lower cost power plants Upper Kotmale (hydro) and Puttalam (coal) under construction, and the second coal-fired power plant planned in Trincomalee, which are expected to assist electricity prices to be reduced in real terms, to a regionally competitive level. More potential remains to further reduce network technical and commercial losses, and to improve managerial efficiency, supply reliability and service efficiency.

1.1 Institutional Structure

The following institutions are directly involved in the electricity industry in Sri Lanka through the national grid.

Government, regulatory and facilitation agencies
- Ministry of Power and Energy (MOPE)
- Public Utilities Commission (PUCSL)
- Sri Lanka Sustainable Energy Authority (SEA)

Electricity Utilities
- Ceylon Electricity Board (CEB)
- Lanka Electricity Company (Pvt) Ltd (LECO)

Independent Power Producers (IPPs)
- Nine thermal IPPs
- About 80 Small Power Producers (SPPs)

In the off-grid services, a number of suppliers of solar photovoltaic systems and about 300 community cooperatives developing and managing small village-level hydroelectric systems are active.

1.2 Electricity Generation

Sri Lanka's electricity development was initially focussed on developing conventional hydropower resources. Commencing in year 1950, a total of 1205 MW of medium and large-scale hydropower generating capacity has been built by end 2007, to supply the national grid. (See Table 1).

In year 1995, Sri Lanka produced 95% of the grid electrical energy requirements from such conventional hydropower plants. However, with no major new hydroelectric projects to be developed, the dominance of hydropower changed dramatically from 1996 onwards. The growing demand for electricity had to be met with new thermal power plants. Between 1996 and 2008, Sri Lanka added 965 MW of oil-fired power plant to meet the growing demand for electricity. Over the same period, households using electricity rose from 47% to 80% and a similar increase in demand was observed from commercial and industrial customers. In year 2007, 59.8% of energy in the national grid was sourced from oil-fired thermal power plants (see Table 2). In a year when hydropower output decreases owing to adverse weather, the share of electricity from oil-fired thermal power plant rises to about 65%.

Table 1- Power Plants in Operation in the Sri Lanka National Grid by end 2007

Power Plants	Installed Capacity (MW)	Share of Total Capacity	Gross Energy Dispatched to the Grid in 2007 (GWh)	Share of Total Energy
Hydro and other renewable				
CEB Hydro Power Plants	1205.0	50.1%	3,602.9	36.7%
Small Power Producers (Hydro)	117.1	4.9%	342.8	3.5%
Small Power Producers (Biomass, solar)	2.1	0.1%	1.3	0.0%
CEB Wind Power Plant	3.0	0.1%	2.3	0.0%
Total hydro and other renewable	**1327.2**	**55.2%**	**3,949.2**	**40.2%**
Thermal Power Plants				
CEB Thermal Power Plants	528.0	22.0%	2,335.5	23.8%
IPP Thermal: Petroleum	550.1	22.9%	3,528.5	36.0%
Total thermal power plants	**1078.1**	44.8%	**5,864.1**	**59.8%**
Total Grid connected power plants	**2405.3**	**100.0%**	**9813.3**	**100.0%**

Note: Installed capacity data as of end December 2007
Sources:
1. CEB Long-term Generation Expansion Plan Dec 2005
2. Sales and Generation Data Book, CEB, 2007

Note: The oil-fired Kerawalapitiya power plant (Stage 1: 200 MW) was commissioned during year 2008
CEB: Ceylon Electricity Board IPP: Independent Power Producers

Table 2- Sri Lanka Generating Capacity Share on the Grid by Source (2007)

Primary Source	Installed Capacity (MW)	Share of Total Capacity	Gross Energy Dispatched to Grid in 2007 (GWh)	Share of Total Energy
Hydro	1,322.1	55.0%	3,945.6	40.2%
Biomass, solar	2.1	0.1%	1.3	0.0%
Wind	3.0	0.1%	2.3	0.0%
Fossil Fuel (oil)	1,078.1	44.8%	5,864.1	59.8%
Total	2,405.3	100.0%	9,813.3	100.0%

1.3 Electricity Generation

1.3.1 CEB Power Plants

Sri Lanka's electricity generation to serve the national grid from around 1950 until 1996 was entirely by stated-owed institutions, initially by the Department of Electrical Undertakings (until 1969) and subsequently by CEB. There are sixteen CEB hydropower plants and six oil-fired thermal power plants. The hydropower plants are on Mahaweli river (6 power plants in cascade, 660 MW), Kelani river (5 power plants in cascade, 335 MW), Walawe river (Samanalawewa power plant 120 MW), Kalu ganga (Kukule power plant 70 MW), the two smaller power plants at Inginiyagala and Uda Walawe (irrigation reservoirs) and Nilambe. CEB's thermal power plants are in two clusters in Kelanitissa (three types of power plants) and Sapugaskanda (two power plants), and a smaller power plant in Chunnakam in the north. Most of the power plants of CEB have been developed using concessionary financing received by the Government on-lent to CEB.

1.3.2 Private Thermal Power Plants

Since 1996, the private sector has been allowed to participate in electricity generation. Sri Lanka presently has nine private thermal power plants supplying the national grid, all of them oil-burning, and two private oil-burning thermal power plants serving the mini-grid in the Jaffna peninsula[1]. In year 2007, private thermal power plants accounted for 22.9% of installed generating capacity on the gird, and 36% of energy served to the grid. The list of private power plants is given in Table 3. Their contract periods range from 10 to 20 years. The prices are structured in the form of a two-part tariff, a capacity charge and an energy charge.

Table 3- Thermal Power Plants owned by IPPs serving the grid

Plant Name	Capacity (MW)	Minimum Guaranteed Energy (GWh)	Contract Duration (years)	Technology (fuel)
Lakdanavi	22.5	156	20	Diesel (fuel oil)
Asia Power	51	330	20	Diesel (residual oil)
Colombo Power (Barge)	64	420	15	Diesel (fuel oil)
ACE Power Matara	24.8	167	10	Diesel (fuel oil)
ACE Power Horana	24.8	167	10	Diesel (fuel oil)
AES Kelanitissa	163	1314	20	Combined Cycle (diesel)
Heladhanavi	100	698	10	Diesel (fuel oil)
ACE Power Embilipitiya	100	697	10	Diesel (fuel oil)
Kerawalapitiya (stage 1)	200	*	20	Combined Cycle (fuel oil)
Total IPP	**550.1**	**3949**		

* Stage 1 of power plant commissioned by end 2008. Stage 2 is under construction.

[1] The Jaffna peninsula has been disconnected from the national grid owing to the conflict and is expected to be reconnected to the national grid within the next few years. These contracts are medium-term, typically three years. A power plant with a longer term contract is also under construction in Jaffna.

1.3.3 The Small Power Development Program

Renewable energy-based electricity generation from non-conventional renewable energy sources (NCRE) received a new impetus in 1996, when the Government announced a standardised power purchase agreement and a standardised tariff for private developers of NCRE-based power plants of capacity less 10 MW. By end 2008, a total of 80 small power plants have been built by private developers under the Small Power Producer (SPP) program, including two biomass power plants, one waste heat power plant and two solar PV systems. These small power plants, all of them built by the private sector, provided 3.5% of grid electricity requirements in 2007 (4.2%[2] in 2008). Dozens of new small power plants are in various stages of development.

1.4 Power Transmission

CEB owns and operates the entire electricity transmission network that operates at 220 kV, 132 kV, and most of the two sub-transmission networks of 33 kV and 11 kV. Some 11 kV lines are owned and operated by LECO. Electricity generated at power plants is stepped up to one of the two transmission voltages and transmitted to receiving stations around the country. The receiving station for Colombo is at Kolonnawa. There are 34 grid substations throughout the country, where the power received at 220 kV or 132 kV is stepped down from the transmission voltages to the sub-transmission level (33 kV) to be distributed over a large local area.

1.5 Distribution, Customers and Sales

By the end of 2007, CEB had 76,102 km of low voltage lines for distribution purposes. CEB distributes electricity to 89% of the customers while Lanka Electricity Company (LECO) feeds the balance. LECO was established in 1983 to distribute electricity in areas previously served by Local Authorities (Municipal Councils, etc;). LECO purchases electricity from CEB and distributes among retail and bulk customers in their designated areas, between Galle and Negombo along the western coastal belt.

There were 4,301,197 electricity customers served by the national grid by end 2007. Household customers were the largest group (88%). Commercial customers (all public and private offices, shops, commercial buildings, schools, hospitals, etc.) were a further 10%. Industrial customers accounted for 1%. LECO serves approximately 10% of customers in the country.

[2] provisional data

Table 4- CEB and LECO Customers by End 2007

Customer Class	CEB	LECO	Number of Customers	Share
Household	3,409,440	371,519	3,780,959	87.9%
Religious Places	22,804	2,141	24,945	0.6%
Industrial	37,270	4,028	41,298	1.0%
Commercial	397,435	52,637	450,072	10.5%
Street Lighting	1	3,922	3,923	0.1%
Total	**3,866,950**	**434,247**	**4,301,197**	**100.0%**

Table 5- CEB and LECO Sales in GWh

Customer Class	2003	2004	2005	2006	2007
Households	2,392	2,594	2,859	3,056	3,178
Religious	42	45	49	51	50
Industry	2,411	2,530	2,686	2,901	2,911
Commercial	1,212	1,323	1,465	1,633	1,864
Street Lighting	103	106	141	125	136
Total Sales	**6,160**	**6,599**	**7,201**	**7,766**	**8,139**
Sales Growth	12.9%	7.1%	9.1%	7.9%	4.8%

1.5.1 Progress with Access to Electricity

Grid Connected Supply: By mid 1980s, CEB was entrusted with the task of implementing rural electrification objectives of the government in a more systematic manner. Rural electrification was identified as a separate function in the CEB, and most of the grid extension work into rural areas was structured in the form of Projects. Proposed rural electrification schemes were surveyed and analysed, and packaged into projects and presented for financing. The first such project was funded by the Asian Development Bank (ADB) in 1983. A total of seven such “projects” have been implemented by CEB, that has catalised the rapid electrification of the country, now reaching about 80% of all households.

Off-Grid Electricity Supply: Most non-electrified households use kerosene for lighting. The estimated consumption of kerosene for household and the commercial sector was 152,000 MT in year 2004, most of which would be for household lighting. The number of households with no electricity connection and using kerosene for lighting in 2003/4 was estimated in the consumer finance survey to be 25%, or about 1.25 million households.

In non-electrified areas, automobile batteries are used in some households to obtain electricity supply, mainly for lighting and to operate TV and radio-cassette sets. Batteries are recharged about 2-3 times a month at the nearest electrified village or town. There is an increasing trend in the use of micro hydro plants (typically less than 20 kW) and household solar PV units to meet the basic electricity needs of rural households.

Since year 1998, the Energy Services Delivery (ESD) and Renewable Energy for Rural Economic Development (RERED) projects have financed off-grid renewable energy projects on a priority basis, inclusive of grant funding. Table 6 shows the progress reported by the project.

Table 6- Status of Off-grid Renewable Energy Development

Systems		1998	1999	2000	2001	2002	2003	2004	2005
Off-gird hydro	Cumulative capacity (kW)	-	22	75	128	350	500	796	1,025
	Households served	-	140	365	573	1,732	2,545	3,711	4,594
Solar Home	Cumulative capacity (kW)	2	26	109	616	985	1,868	2,904	3,910
Systems	Households served	50	683	2,574	13,316	20,953	39,530	62,834	83,773

Source: ESD and RERED Project, web: www.energyservices.lk
Note: Only the systems funded under the projects are included. These are considered to be the major share of off-grid renewable energy systems presently operational in the country.

1.6 Electricity Tariffs

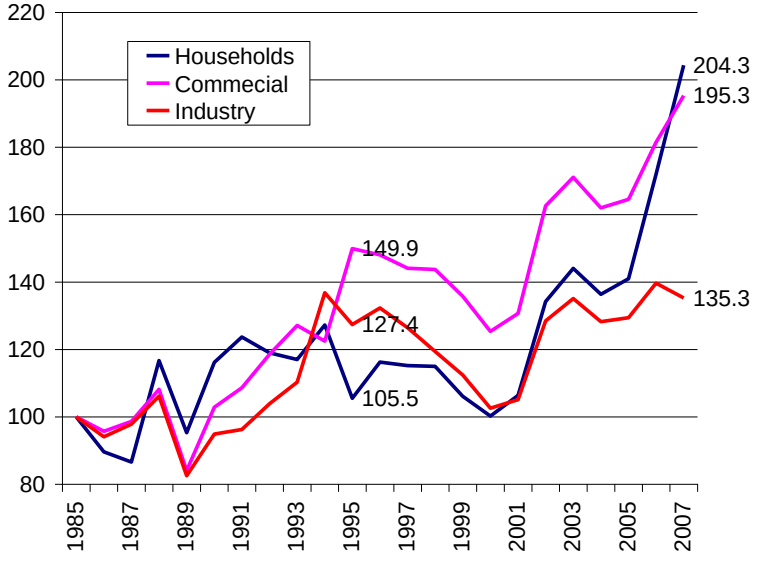
Table 7 gives an analysis of the electricity prices over 2001-2007 of the average electricity prices to different classes of customers of CEB, shown in both LKR and equivalent USCts, to enable comparison with international prices. The longer-term tariff development shown in Figure 1 shows that the commercial customers have borne the highest impacts of the rising prices, while the impacts on tariffs to industry has been the lowest over the past 22 years.

Table 7- Electricity Prices in Sri Lanka 2001-2006

Year	LKR/USD	Residential		Commercial		Industrial		Streetlights		Total	
		LKR/kWh	USCts/kWh	LKR/kWh	USCts/kWh	LKR/kWh	USCts/kWh	LKR/kWh	USCts/kWh	LKR/kWh	USCts/kWh
2001	93.16	3.94	4.23	8.74	9.39	6.29	6.75	5.70	6.12	5.48	5.88
2002	96.73	5.17	5.34	11.30	11.68	7.99	8.26	7.35	7.60	7.25	7.49
2003	96.52	5.54	5.74	11.86	12.29	8.38	8.68	7.80	8.08	7.68	7.96
2004	101.92	5.53	5.43	11.86	11.64	8.40	8.24	7.84	7.70	7.66	7.52
2005	100.50	5.64	5.61	11.88	11.82	8.36	8.32	7.82	7.78	7.71	7.67
2006	103.96	7.12	6.85	13.55	13.03	9.33	8.97	8.82	8.48	8.99	8.65
2007	110.62	9.00	8.14	15.52	14.03	9.62	8.69	11.89	10.75	10.56	9.55

Notes: 1. Electricity rate is total sales income to Ceylon Electricity Board from each customer class divided by the electricity sold.
2. LKR/USD rate is the average rate for the year published by the Central Bank of Sri Lanka.
3. Total selling price includes all sales by CEB, including bulk sales to LECO.

Figure 1- Development of Tariffs to Different Classes of Customer



Note: Price comparison to different customer classes is on the basis of equivalent UScts per kWh. 1985 = 100

1.7 Electricity Utility Financial Performance

CEB is the dominant market player, who owns or procures all the generation into the national grid. With generation costs being the dominant component of costs, analysis of CEB costs provide a strong indication of the cost structure, and answers to some of the questions about Sri Lanka's relatively high electricity costs and CEB's inefficiency, if any. In Table 8, the costs of CEB are analysed in detail with the objective of examining the costs and the cost structure in year 2005. LECO, which buys electricity from CEB and sells to retail (400 V, 230 V) and bulk customers (11 kV) serves about 10% of energy, but LECO is not included in this analysis owing its relatively small size and owing to the bulk sale tariff to LECO being adequate for LECO to sell electricity at the same prices as CEB and yet remain profitable.

The tariff income caused the average earnings of 7.71 LKR/kWh in 2005, whereas the revenue requirement was 9.62 LKR/kWh to satisfy the cash flow requirements of the year, without a return on investment. It is clear that out of the total operating costs of LKR 69,717 million in year 2005, LKR 56,398 million (81%) was for power generation requirements. At the time of writing (2009), these costs have reached about double the levels of 2005.

Table 8 - CEB Expenses Requirements in 2005

Businessline		Cost (LKR million)	Energy Delivered (GWh)	Average Cost (LKR/kWh)
Generation	Hydroelectric Power Plants (CEB)			
	Repayment of long-term loans	1,013		
	Interest on long-term loans	203		
	Operation and maintenance	1,588		
	Total	**2,803**	**3,175**	**0.88**
	Thermal Power Plants (CEB)			
	Fuel costs	17,828		
	Operation and maintenance	3,243		
	Repayment of long-term loans	498		
	Interest on long-term loans	996		
	Total	**22,565**	**2,162**	**10.44**
	Thermal Power Plants (IPP)			
	Total	**29,516**	**3,152**	**9.36**
	Small Power Producers (SPPs)			
	Total	**1,515**	**280**	**5.41**
	Total Generation	**56,398**	**8,769**	**6.43**
	Power Plant Auxiliary Consumption		62	
	Net generation		8,707	**6.48**
Transmission	Entire CEB Transmission Network			
	Repayment of long-term loans	719		
	Interest on long-term loans	1,437		
	Operation and Maintenance			
	Total for Transmission	**2,156**		
	Total for Generation and Transmission	**58,554**	**8,707**	
	Transmission Loss		303	0.49
	Net after Transmission		**8,404**	**6.97**
Distribution	Entire CEB Distribution Network			
	Repayment of long-term loans	141		
	Interest on long-term loans	282		
	Operation and Maintenance	10,821		
	Total for Distribution	**11,243**		
	Total for Generation, Transmission and Distribution	**69,797**	**8,404**	**8.30**
	Distribution Loss		1,149	
	Net after Transmission and Distribution Loss		**7,255**	**9.62**

Sales	Sales	**55,936**	**7,255**	**7.71**
Deficit	Cashflow Deficit	**13,861**		**1.91**

Thus, in spite of requests for tariff adjustments, the tariffs allowed were consistently below the revenue requirements, and financial collapse of CEB was inevitable. The situation worsened in the subsequent years, when the oil prices gradually increased to reach a peak in mid-2008, and CEB's estimated annual cahsflow requirements reached LKR 145 billion, requiring an average customer price of about LKR 15 per kWh. Customer tariffs never reached this required level, except for a brief period between February-November 2008, when the average prices were estimated to have reached 14.50 LKR/kWh. Since then, in response to declining oil prices, the fuel adjustment charges have been reduced and the average income estimated in year 2009 is about 13 LKR/kWh.

Accordingly, CEB has been reporting losses since 1999. The government has provided "grants" to CEB over the past few years by various means such as (1) direct settlement of CEB dues to Ceylon Petroleum Corporation for the fuel purchased (2) a moratorium on capital and interest due from CEB on account of long term debts (3) removal of VAT on fuel oil, the main fuel used by CEB and IPP thermal power plants, and many other interim measures to prevent CEB's financial collapse.

1.8 Future Electricity Generation in Sri Lanka

Sri Lanka's hydroelectric potential, for both large and small developments for power generation, is limited. All the small hydropower development sites in the capacity range of 250 kW to 10 MW have either been developed already or in various stages of development. A few large projects beyond the 10 MW limit allowed in the SPP program, remain yet to be developed, most of which are associated with new irrigation schemes. Very small and micro-hydro power projects remain to be developed, but there too, the total potential is limited.

Thus Sri Lanka's electricity generating system, presently dominated by oil-fired electricity generation, will in future be dominated by coal-fired power plants, the cheapest alternative to oil-fired generation. Table 9 shows the published long-term generation expansion plan of CEB, which shows the planned dominance of coal-fired power generation in the future, while phasing out the oil-fired generation. The first coal-fired power plant scheduled for operation by year 2011 is presently under construction.

The base case plan (Table 9) is the least-cost plan approved for implementation. Accordingly, Sri Lanka's energy mix in the generating system, as stated in the long-term generation expansion plan would change from the present oil-dominant status to be coal-dominant, as shown in Table 10. The share of hydropower is estimated to reduce from 40.2% in 2007 to 19.5% by 2020, while coal-fired thermal generation is estimated to reach 70.9% by 2020. Oil-fired thermal generation which accounted for 59.8% of energy input to the grid in 2007, would be phased out and will provide 9.6% of energy by 2020.

Table 9- Sri Lanka's Long-term Generation Expansion Plan 2005 (Base Case Plan)

YEAR	**HYDRO ADDITIONS**	**THERMAL ADDITIONS**	**THERMAL RETIREMENTS**	**LOLP %**
2006		-	-	1.081
2007	-	-	-	3.760
2008	-	*200 MW GT part of Kerawalapitiya Combined Cycle Plant*	-	2.792
2009	-	***100 MW ST PART OF KERAWALAPITIYA COMBINED CYCLE PLANT*** **245 MW Gas Turbines**	-	0.817
2010	-	**285 MW Gas Turbines**	3x17 MW Gas Turbine at Kelanitissa	0.676
2011	*150 MW Upper Kotmale*	600 MW Coal Steam (West Coast)		0.003
2012	-	300 MW Coal Steam (West Coast)	20 MW ACE Power Matara	0.002
2013	-	300 MW Coal Steam (South Coast)	22.5 MW Lakdhanavi Plant 4x18 MW Sapugaskanda Diesel Plant 20 MW ACE Power Horana	0.007
2014	-	300 MW Coal Steam (South Coast)		0.006
2015	-	300 MW Coal Steam (South Coast)	60 MW Colombo Power Plant 100MW Heladhanavi Diesel Power Plant at Puttalam 100MW ACE Power Diesel Power Plant at Embilipitiya	0.063
2016	-	300 MW Coal Steam (South Coast)		0.077
2017	-	300 MW Coal Steam (East Coast)	-	0.109
2018	-	300 MW Coal Steam (East Coast)	115 MW Gas Turbine 7 at KPS 51 MW Asia Power Plant	0.428
2019	-	300 MW Coal Steam (East Coast)		0.675
2020	-	300 MW Coal Steam (West Coast) 105 MW Gas Turbines	-	0.696
Total PV Cost up to year 2020, **US$ 4,783.9 million** (LKR 476,679.7 million)				

Source: Long-term Generation Expansion Plan, Ceylon Electricity Board, December 2005
LOLP: Loss of Load Probability, an indicator of the reliability of the generating system

Table 10- Planned Generation Mix in the Sri Lanka Grid (Base Case)

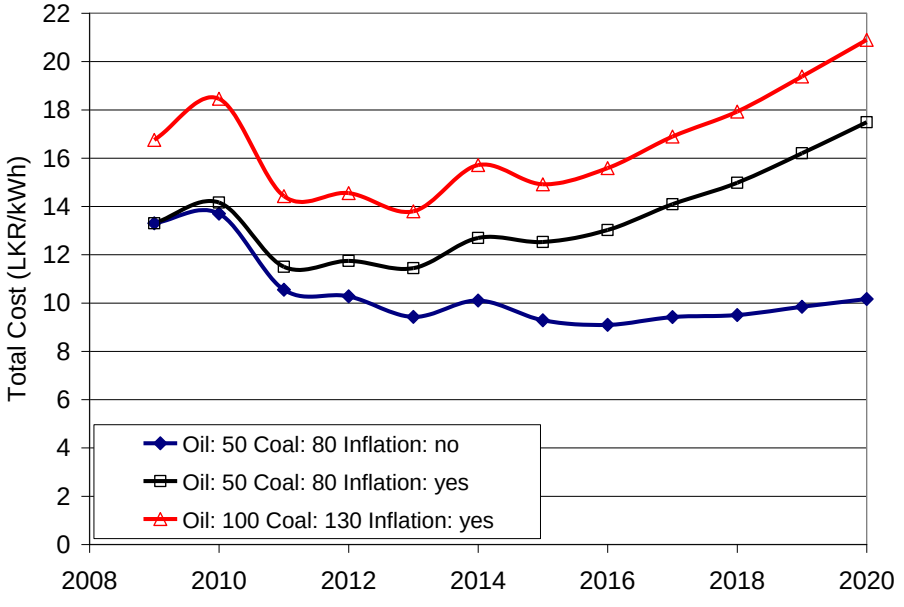
Primary Source	Gross Energy Dispatched to Grid (GWh)				Share of Total Gross Energy in the Grid			
	2007	2010	2015	2020	2007	2010	2015	2020
Hydro	3946	4,464	4,994	4,994	40.2%	36.7%	28.2%	19.5%
Biomass, solar	1	Not included in the long-term plan			Not included in the long-term plan			
Wind	2	Not included in the long-term plan			Not included in the long-term plan			
Oil-fired thermal	5864	7,705	1,009	2,473	59.8%	63.3%	5.7%	9.6%
Coal-fired thermal		-	11,681	18,187	0.0%	0.0%	66.1%	70.9%
Total	9813	12,169	17,684	25,654	100.0%	100.0%	100.0%	100.0%

Source: Long-term Generation Expansion Plan, CEB, December 2005

The generation mix would be slightly altered owing to the contribution from non-conventional renewable energy sources, which are targeted to serve 10% of the grid electricity requirements by year 2015, and develop further.

The significant feature of the long-term plan, if implemented on schedule is that existing oil-fired thermal power plants of both CEB and IPPs would used sparingly after about year 2012, when coal-fired power generation is added to the generating system from year 2011 onwards. Accordingly, the cost of generation is expected to follow the profile shown in Figure 2.

Figure 2- Expected Cost Profile of Sri Lanka Power Sector



Note: The calculated costs are per kWh sold, assuming the long-term generation expansion plan would be implemented on schedule. The costs would meet all the cash flow requirements of CEB, and CEB would breakeven every year, if the tariffs match the average costs. Oil prices are in USD per barrel, coal prices are in USD per tonne, delivered to Sri Lanka. Inflation and currency depreciation rates assumed to be the average of 2002-7.

2 ISSUES AND CHALLENGES FACED BY THE ELECTRICITY SECTOR

Initially, the pressing problems in the electricity industry, policy and other initiatives are presented. New initiatives required to achieve the other desirable features of the sector are listed next. Issues and challenges listed are not in the order of priority.

2.1 Ensuring Countrywide Access to Electricity

CEB has reported over 80% of households to be with an active electricity connection by year 2008, meeting the target set for electrification several years ago. The national energy policy declares the desire of the government to achieve 95% of electrification by year 2015 (with a mix of grid extensions and off-grid solutions), with an interim target of 80% by 2010 (which has already been achieved). With several rural electrification projects already being implemented and more projects in the pipeline, the 2015 target appears to be well within reach. Investments on grid extension to reach the remaining households are funded either

directly by the government or by international lending agencies, and CEB is not expected to repay such loans. However, a growing share of low-consuming, low-income household consumers placed in the distant corners of the distribution network would increase the cross-subsidies on tariffs, cause higher distribution sector overheads and maintenance costs, and cause higher network losses.

2.2 A Cost-reflective Tariff Structure and Targeted Subsidies

The present (June 2009) tariff is considered to be just adequate to breakeven in 2009, if oil prices remain at the current (USD 50 per barrel) level. There will thus be no provisions to make any returns on CEB's investments. Within the existing non-cost reflective tariff structure, too, there are cross-subsidies, particularly to low end customers (life-line rate, defined to be up to 30 kWh/month) and other household customers (up to 90 kWh/month). From February 2007, industries too have been added to the customer groups receiving cross subsidies, leaving the high-end household customers (using over 90 kWh/month) and the general purpose (ie commercial) customers to finance the cross subsidy. In spite of a clear statement in the national energy policy on the issues of cost-reflective tariffs and targeted subsidies to be implemented from year 2007, no action has been taken to date to move towards such a logical tariff structure. The tariff structure being used is one that emerged in 1980s, and only modified slightly from time to time.

2.3 Achieving Lower, Regionally Competitive Electricity Prices

For high-end household customers, and medium and large commercial customers, Sri Lanka's prices are the highest in the region, while other consumer groups too pay a relatively higher price. In addition to implementing tariff reforms and targeted subsidies, it is essential to manage the costs of the power sector in alignment with the cost profile shown in Figure 2. The issue is that when fuel prices increase in the international markets, the burden on the electricity consumer in Sri Lanka is disproportionately higher than the burden on similar customers in other countries in the region. This owes to the abnormal fuel-mix in electricity generation, dominated by fuel oil and diesel burning power plants, to the exclusion of coal (and nuclear) power plants available in electricity grids of neighbouring countries.

2.4 Adhering to the Long-term Generation Expansion Plan

Generation costs exceed 80% of the total cost of the electricity sector, and they are clearly higher than the costs experienced by other countries in the region. The causes for these higher costs were (i) deviation from the long-term generation expansion plan owing to political decisions to cause delays in vital low-cost generating plants (ii) replacement of such low cost power plants in the plan with oil-burning power plants, mostly by the private sector. The electricity sector should provide electricity to customers at a fair, regionally competitive price. The key challenge to achieve a reduction in total system costs in real terms, is to ensure that the generation expansion plan is kept on track, without being allowed to be derailed with new proposals, new technologies and new fuels proposed by interested parties with political afiliations, from time to time. In spite of international and independent reviews on the planning methodology and plans used in developing the long-term plan, questions are raised and

deviations do occur, sometimes within the sector institutions and the government itself. The guidelines for the expansion of the generating system are clearly spelled out in the national energy policy, which states that coal and non-conventional renewables will be the third and the fourth fuels to drive the next phase of development of the electricity industry. The policy places a moratorium on new oil-fired power plants and fuel of which the price is linked to oil prices, such as natural gas. In spite of these firm policy statements and clear, quantified consequences of building any oil or gas-fired power plants, repeated attempts are being made to build oil or gas fired power plants, and to force CEB to issue letters of intent or sign power purchase agreements.

2.5 Accountability of Business-lines and Business Units

The overall accountability of the business-lines requires to be raised in their respective spheres of engagement, ranging from financial performance, technical quality and reliability of service, and the quality of customer service.

2.6 Transfer Pricing

The key to establishing accountability is to make each power plant, transmission sub-network, distribution region/division and area, to be a cost/profit centre. Transfer prices have to be calculated when the primary source of energy is input to each power plant, and when electricity crosses each boundary of the network to reach the customer. It would be required to establish the present status, establish targets and monitor performance of each operational unit over a wide range of parameters and indices. Transfer pricing is presently transparent only in the case of IPPs, SPPs and in the sale of electricity to LECO.

2.7 Streamlining Planning and Procurement

Generation, transmission and distribution planning in Sri Lanka have followed the principles of lowest-cost to achieve a pre-defined reliability, but procurement in all the three functions has deviated significantly from the plans, in addition to the delays, which have caused the undue increase in electricity generating costs (thereby prices) and numerous constraints in operating the transmission and distribution network. Electricity planning methodology and underlying principles are often challenged by various interest groups, at times within the utility industry itself. The requirement is to review and re-establish planning guidelines and associated procurement guidelines, as well as rules, to ensure that the electricity customer gets the best deal in terms of competitive electricity prices and a matching quality of service.

2.8 Power System Reliability and Service Quality

Supply reliability and service quality have received minimal attention. System outages ranging from national-level grid failures to local area outages are not investigated fully, to examine the technical reasons and to report on actions taken to prevent a recurrence. While establishing a mechanism to examine such major events, a transparent system of reporting and aggregating service outages, both announced and unannounced, consequent financial

losses, publication of widely accepted reliability indices for each segment of the network/geographical area, are yet to be established.

2.9 Improvement of Customer Service

Customer complaints ranging from long-term inaction (in case of applications for a of new service connection) to delayed attendance to service outages, are common. Calls to the once widely publicised customer service centre of CEB remain unanswered, while regional consumer service centres lack adequate staff and training to provide a courteous service, or even to merely answer the phone and provide information. While improving these service and access modes available to customer, it would be essential to publish the information about the speed at which customer requests and complaints are attended to.

2.10 Safety in Electricity Supply and Use

A largely neglected area is the safety of persons and equipment, both on the supply side and among the end-users of electricity. Utilities have their safety standards, while electricity users follow whatever standards implied by the equipment and material used on distribution networks. There are no safety inspections on utility equipment and procedures by independent parties. It would be essential to reassess the safety manuals and standards followed by the electricity supply utilities in all areas of the supply industry, and to re-define/develop safety standards for distribution networks and appliances used by customers.

2.11 Transparency of Operations and Information Availability

Much of Sri Lanka's electricity industry information is widely available ex-post by way of three publications: the Generation Expansion Plan[3], the Statistical Digest[4] and the National Energy Balance[5]. Ceylon Electricity Board annual report, too, is a public document. Additional information about costs and prices, in a manner that industry analysts and customers develop confidence that primary energy resources and investments are optimally used, and cost/price information, is not available. Availability of this information and the coverage of already published documents, and the channels available for the public to access the information requires to be strengthened and streamlined.

[3] published by Ceylon Electricity Board annually until 2005, not published in 2006-8.

[4] published by Ceylon Electricity Board annually, old versions available on the CEB website www.ceb.lk

[5] published by Sri Lanka Sustainable Energy Authority (SEA), book and CD. Some outdated information available on the SEA website www.energy.gov.lk

3 NEW ELECTRICITY ACT, ITS POTENTIAL AND LIMITATIONS

3.1 Background and the Present Status of the Electricity Act

A new Act to govern the Electricity Sector in Sri Lanka has been in discussion for more than a decade. The Electricity Act was first enacted in 1950, and later amended as Electricity (Amendment) Act (Chapter 205) in 1957. In 1969, the Ceylon Electricity Board Act was introduced, giving provisions for the establishment of the Ceylon Electricity Board and transferring the Central and Local Governments electrical undertakings to the new board along with their staff.

However, a need to restructure the electricity sector was identified as part of a solution to numerous problems faced by the electricity sector in the later part of 1990s. These included the shortfall of generation capacity resulting in load shedding, severe financial hardships created by mismatches in cost and price of electricity, and administrative inefficiencies largely due to politicisation of the sector.

Restructuring of the sector, essentially meant the re-structuring of the CEB which was believed to be too large to be managed efficiently and had a monopoly in the market, preventing competitiveness within the market. After much debate within and outside Parliament, the Electricity Reform Act of 2002 was introduced, to facilitate the restructuring process of the sector. This new Act was to repeal the Ceylon Electricity Board Act and specified vertical unbundling of the CEB with a single buyer model for transmission and further unbundling of distribution to five different companies. Regulation of the sector and these independent business units were to be handed over to an independent regulatory body. For this, the Public Utilities Commission of Sri Lanka Act was also enacted in the same year (2002) giving provisions to the establishment of the Public Utilities Commission (PUCSL) to regulate certain utility industries including electricity.

PUCSL came into operation in 2003 with the appointment of the first group of commissioners and the Director General. However, for the commission to exercise its assigned powers over the electricity sector, the Electricity Reform Act had to be fully operational through a Ministerial Order which did not take place owing to opposition by CEB staff and for political reasons. Hence, PUCSL was not fully functional during the last six years alongside the dormant Electricity Reform Act. Although several further attempts were made to revise the Act to suit the ever-changing demands of various sections of sector employees, none of them were followed through to Parliament for approval and implementation.

With the virtual abandonment of the Electricity Reform Act, the present government took a policy decision to introduce regulatory reforms of the electricity sector without making major structural changes to the CEB. In this line of thought, a bill was presented in Parliament in February 2008, followed by many rounds of revisions. The Parliament approved the electricity bill and it has now been published as the Electricity Act No. 20 of 2009 dated. With this, the electricity sector of Sri Lanka officially comes under the regulatory purview of the Public Utilities Commission of Sri Lanka.

3.2 Basic Features, Potentials and Limitations of the New Electricity Act

Following are the broad functional areas introduced by the Electricity Act of 2009.

- Overall administration of the Act by PUCSL
- Policy guidelines to be issued by the Minister
- Licensing for electricity generation, transmission and distribution
- Sector efficiency and competition
- Consumer protection and pricing
- Planning and implementation
- Transparency and publication of information
- Conservation of electricity

3.2.1 Function of PUCSL

The Electricity Act of 2009 assigns PUCSL as its administrator. It is the responsibility of PUCSL to ensure that all provisions specified by the Act are made effective. To facilitate this, PUCSL is given the authority to take all measures it deems necessary in achieving its objectives and has been given provisions to make the PUCSL financially self sustained through levies chargeable from the licensees of the electricity industry.

To maintain independence, the appointment of officials to the PUCSL has been streamlined through the PUCSL Act. It specifies the appointment of five independent commissioners from different fields of specialisation including engineering, law and business management. Appointment of the commissioners is done by the Minister with the concurrence of the Constitutional Council, and all appointments have stated eligibility criteria, preventing the appointment of any unsuitable person.

The Director General and the staff of the PUCSL are appointed by the members of the Commission, only to whom the staff is answerable. Hence, the staff of PUCSL is expected to be in a position to carry out their duties and responsibilities without any undue interference from politicians, bureaucracy or other interested parties of the country.

The proper functioning of PUCSL is crucial for the successful implementation of the Electricity Act. The Act specifically mentions the following broad areas of functionality for the PUCSL

- Advise the government on matters related to the electrical industry
- Regulate the implementation of the Codes of Practice and other requirements specified by the Act
- Approve technical and operational codes developed by the licensees
- Regulate tariff and other charges levied by licensees and other electrical undertakings
- With the consultation of licensees, publish the rights and obligations of consumers
- Collect and record information on the electricity industry
- Set and enforce technical and other standards related to safety, quality, continuity and reliability of electricity supply and metering
- Promote efficient use and conservation of electricity

- Prepare a regulatory manual and update it from time to time
- Consult those who are affected by the decisions of the commission

The above list is a testimony to the multifaceted capabilities and the level of resources PUCSL needs to posses, to carry out its functions effectively. Engineering, finance and economics, law and business management are all requisite expertise from the PUCSL.

The six year period from the establishment of the PUCSL in 2003 to the actual taking over of regulatory role in 2009 can be considered a blessing in disguise, as the time it had to prepare itself for the all important regulatory role could prove decisive for the success of the implementation of the Electricity Act. An unprepared regulator assigned with so many important tasks of the electricity industry could have created an adverse impact not only on the industry, but also on the standing and public acceptance of the Electricity Act.

If PUCSL is successful in carrying out its duties as expected, the electricity industry would become significantly protected against political interferences, allowing the professionals to plan and execute the best for the country.

However, the relatively low level of restructuring introduced by the new Electricity Act of 2009 compared with the Electricity Reform Act of 2002 would result in CEB remaining almost the same in structure, with the potential of being too large and diverse to be effectively regulated in manner demanded by modern regulatory standards. PUCSL needs to be prepared to counter these challenges and emerge as a strong body, if it is to fulfill the role the country is expecting it to perform.

3.2.2 Authority over Policy Matters

A feature of the new Electricity Act is that the authority over making policy decisions relating to the electricity sector has been retained with the Minister and the Cabinet. Therefore, the functions of PUCSL are broadly guided and limited by the policy framework. It is always deemed to be the responsibility of the government to set the direction the country should move by way of setting policies and making sure the policies are executed by the administrative structure. Similarly, in the electricity sector, this role will be handled by the government in order to safeguard the ‘public interest’.

In the new Electricity Act, the aspects that need to be taken into consideration in setting the broad policy guidelines have been specified, so that consistency is maintained between different governments in setting their electricity industry policies. These include meeting the electricity needs for a sustainable economy, fuel diversity and cost reflective prices.

Responsibility of policy making would entail an ownership to the electricity industry on the government. In a way, this is a desirable situation for the electricity industry, as the political support is significant for the proper functioning and development of the sector. Further, instead of being fully structured and insensitive to the public opinion, the policies formulated by the political establishments are expected to bring in the views and the support of the public to the electricity sector.

3.2.3 Licensing

An important feature of both the present and the previous Electricity Acts is the requirement for licensing of the players in the electricity industry. All those who are involved in electricity generation, transmission and distribution are required to obtain a license from PUCSL. According to the previous Act, the licences were issued by Ministry of Power and Energy, though, largely limited to paper work, without any monitoring or follow-up. With the new Electricity Act, the licenses have attained a significant status as a tool to govern the entry and performance of industry participants. In addition to the basic criterion listed below on eligibility for licenses, PUCSL can specify additional conditions to be maintained by the licensees while carrying out their authorised business activity within the electricity industry.

Only the following persons are eligible to apply for a license for **generation** capacity of more than 25 MW.

(i) The CEB
(ii) A local authority
(iii) A company where the government or a public company holds more than 50% of shares
(iv) A company incorporated under Companies Act of 2007 in which shares are held by,
    a. The government
    b. A public corporation
    c. A company having government majority shares
    d. A company having a government subsidiary holding majority shares

In case of (iv) above, the number of shares (as decided by the Secretary to Treasury with the concurrence of Minister of Finance) has not been specified.

The Act does no specify the shareholding requirements for power plant capacities less than 25 MW meaning that the ownership of such power plants is not bound by the requirements of a share holding by the government or connected parties.

Only a **transmission** licensee is allowed to procure electricity from a generation licensee, and the Act further states that an application for a transmission license can only be made by the Ceylon Electricity Board (Section 8(1)).

This effectively specifies a single buyer model for transmission and allows CEB to maintain the overall control of the electricity sector. However, the requirement for application by the CEB for the transmission license instead of an automatic awarding, provides PUCSL with the opportunity to enforce any regulatory conditions as a part of the licenses.

Application for a **distribution** license can only be made by
(i) The CEB
(ii) A local authority
(iii) A duly incorporated company in which the Government has more than fifty percent of shares
(iv) A co-operative society

The above criterion for a distribution license application has kept little space for a new entrant to the distribution business in Sri Lanka. Private sector participation is restricted through the requirement of government majority shares, while co-operative societies owning and maintaining distribution facilities within off-grid village hydro schemes are allowed to obtain distribution licenses through the provisions in (iv) above. Another feature of the distribution license is the allocation of geographical areas for the licensees based on their present and planned presence in electricity distribution. This way, an electricity consumer is constrained to obtain the supply only from the distribution company designated for the area. There is no separation between distribution infrastructure (wires business) and the distribution services (sale of electricity).

While it has been made mandatory to obtain the licenses for all the above, provision of exemptions on a case by case basis is also allowed by the Act, making it possible for unique cases where the generality or complexity of the standard licensing process is not appropriate.

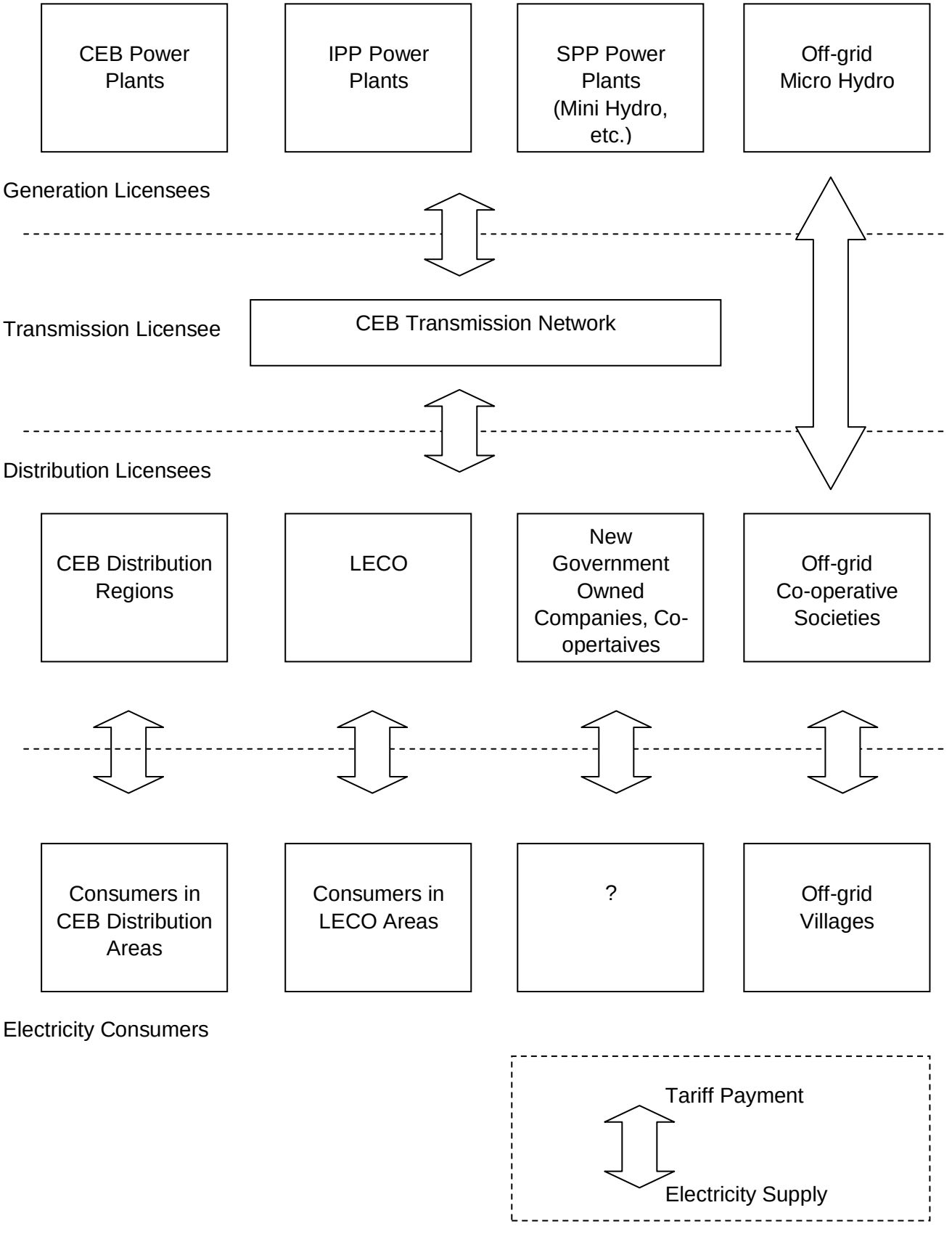
The Electricity Act specifies the issuing of a provisional license to CEB with the validity of six months to ensure continuity of its operations with the Act becoming operational. Within the six-month period, CEB has to apply for individual licenses for power generation, transmission and distribution operations, and upon receipt of these CEB applications, PUCSL will issue licenses with a validity of 15 years to the CEB to continue their operations in the requested geographical areas.

Public is offered a chance to express their views and grievances in relation to a new licence application, while the Minister's concurrence has also been made a pre-requisite for granting licenses by PUCSL.

Through the categorization of the different licenses, a new structure for the electricity industry has been defined in the Electricity Act. As shown in Figure 3, it is only a vertical disintegration of functionality. This has the potential risk of CEB functions divided only into three layers (generation, transmission and distribution) where performance within layers would be evaluated as a whole. For example, even though CEB internally has five separate distribution regions (presently four), disregarding this internal structure, a single license for distribution can be obtained, preventing the much talked about performance evaluation, comparisons and benchmark competition among distribution licensees.

Another notable feature is the restriction on generation, transmission and distribution licensees to obtain licenses for engaging in other layers of the industry, introduced to maintain the transparency within the industry. However, this condition is not applicable for CEB, which is granted licenses through a separate clause superseding this condition.

Figure 3 – The Structure of the Electricity Industry Implied by the Act



3.2.4 Sector Efficiency and Competition through Publication of Information

An important requirement brought in by the new Electricity Act on the industry is the performance reporting by the licensees. The need for operational and performance data to be made available to PUCSL, and thereby to the public, brings in the attribute of transparency and performance monitoring to the electricity sector. As mentioned previously, even at present, electricity sector data is published through several annual publications. However, the channels of access the general public has to this information, and the depth and the quality of the data provided in these publications are far from perfect. To address these shortcomings, the Electricity Act prescribe all relevant data pertaining to the electricity industry to be made available to PUCSL by individual licensees, so that their performance can be measured, primarily by PUCSL and generally by the public.

While the information provided under this requirement of the Act would form the basis for performance evaluation by the PUCSL, which is needed to ensure the regulations and license conditions specified by the PUCSL are adhered to by the licensees, it will also create some degree of notional or benchmark competition among licensees. In addition, sector inefficiencies can be highlighted by such publications and resulting public awareness, forcing those who are responsible for the inefficiencies to rectify them.

3.2.5 Electricity Pricing

An important aspect of the new Electricity Act are the provisions to establish cost reflective pricing for the electricity sector. One of the main reasons for the poor financial performance of the electricity sector for nearly a decade is the adverse (and ad-hoc) pricing policy dictated by the different governments over the years. The Electricity Act allows the licensees to set tariffs in accordance with a cost reflective methodology approved by the commission. While the operational efficiency of licensees is ensured through proper performance monitoring mechanisms, PUCSL would allow the licensees to charge a cost reflective tariff, so that the electricity industry is financially sustainable and would not be a burden on the state or other state institutions.

However, PUCSL would be bound to accept a tariff proposed by a Licensee only if the same is consistent with the government's tariff policy guidelines, and the PUCSL has the authority to set or modify a tariff, taking into consideration the government-provided subsidies and the cross-subsidies recoverable from identified consumer categories. These provisions in the Act would ensure an affordable price for all consumer categories, while enabling the licensees to recover their costs either through tariff or by way of direct subsidies from the government.

3.2.6 Consumer Protection, Safety and Quality of Supply

A new set of regulations on standards to be maintained in providing new electricity connections and the quality of electricity supply is a core regulatory tool specified in the new Act. These regulations would include the quality of electricity services. Distribution licensees would be compelled to adhere to these standards, while any lapses can be brought to the notice of PUCSL, for immediate rectification and compensation.

The provisions given in the Act for the PUCSL to perform the role of a mediator in relation to disputes between different licensees, and most importantly between electricity consumers and distribution licensees, adds a new dimension to the electricity industry. Previously, any grievances of electricity consumers had to be directed to the Ministry (of Power and Energy) which was ill-prepared to resolve such matters in such large volumes, with the required depth of technical analysis and professionalism. Therefore, resolutions were largely one sided and to the dissatisfaction of electricity consumers. Having all relevant rules and regulations properly documented and published on one hand, and having an unbiased third party to report violation of these regulations on the other hand, sets the ground for a modern electricity market where the interests and rights of the consumer are safeguarded.

It is also noted that the Consumer Affairs Authority (CAA) is prevented from exercising its powers over the electricity industry and instead, PUCSL is vested with all powers the CAA has to intervene to protect the rights of electricity consumers.

3.2.7 Planning and Implementation

A critical component of the electricity industry is the planning of investments and operations. Though short term planning is essentially an operational activity of individual licensees, medium to long term plans are national level and needs an integrated approach. The new Electricity Act has assigned the transmission licensee this important role of overall planning and implementation to meet future demand.

As the sole transmission licensee, CEB is held responsible for forecasting the future national demand, planning and development of its own transmission system and procuring new generation plants to meet the forecast demand.

A major deficiency noted here is, with the scale of the market and the role of CEB as a single large organisation dominating the sector, the leverage PUCSL has in ensuring that the optimal power supply options are implemented, is limited. CEB is not compelled to strive for the most optimal solution as its efforts in execution of the same has no yardstick to measure. This, in fact, is similar to the present situation, as the CEB is not accountable for any failure to implement projects timely and efficiently, or for replacing projects in the optimal plan with other projects owing to social, political or commercial pressure.

3.2.8 Private Investments in Future Projects

The Act imposes a limitation on private investments in sector operations, by requiring a shareholding by the government or a government entity in future generation projects, restricting transmission license to be issued only to CEB, and does not allow a majority shareholding by the private sector in a distribution company. Sri Lanka has nine thermal IPPs and over 80 SPPs in which the government has no shareholding at all, and the issues related to licensing these existing generating facilities should be clearly spelled out by PUCSL.

The role of the private sector in developing generating facilities is widely acknowledged, and PUCSL's role would be to establish clear guidelines on how to engage the private sector in

future investments. One of the shortcomings of private investments in power generation over 1996-2008 was that owing to the limited and expensive finances the private sector would access and the lack direction and a clear policy, all the private power plants built were oil-burning power plants, and these are the main cause for the high electricity prices in Sri Lanka. Lower cost power generation projects such as coal were offered to the private sector (but did not succeed) and large hydropower projects were never opened for private investments.

Government shareholdings in major generation projects are not uncommon in developing countries, even for large hydroelectric projects, and PUCSL requires to device a mechanism to facilitate private investments within the framework of the Electricity Act.

4 SPECIFIC POLICY RECOMMENDATIONS TO IMPLEMENT THE ELECTRICITY ACT

4.1 General

(a) The Minister should finalise and publish the policy guidelines issued to the PUCSL, in terms of section 5 of the Electricity Act.
(b) PUCSL should finalise and publish its operating manual, and many other similar manuals and guidelines to be followed by licensees, such as for (i) system planning (ii) tariffs (iii) safety (iv) customer service and power quality (v) safety (vi) reporting formats

4.2 Licensing

The relevant provisions are stated in chapter III (Part I: Licensing) and chapter X (Transitional Provisions) in the Electricity Act.

(a) Based on the transitional provisions, Ceylon Electgricity Board has been issued with one generation license, the transmission license, and four distribution licenses (one for each distribution region). The provisional licenses end in October 2009. The 15-year licenses to be granted to CEB there onwards, should be equally disaggregated into four distribution regions, to enable PUCSL to monitor and implement the provisions of the Act. This recommendation is linked to the recommendation of tariffs, where the tariff submissions will be done separately by each one of the six CEB licensees. The PUC should further stipulate in the licenses that (i) accounts for each generating plant be maintained separately (ii) different parts of the transmission business be separately accounted for (iii) each CEB "Area" (about 40) maintain separate accounts. Owing to the large volume of work required to separate-out and establish asset registers and boundary metering, the PUCSLs license may provide a period of three years (with intermediate milestones) to achieve the full separation of accounts by each licensee.
(b) All grid connected power generating companies (nine IPPs and estimated to be over 80 SPPs) should follow the licensing procedure. The legal requirement for the government or a government entity to be a shareholder in all generating licensees should be resolved in case of existing generation licensees.
(c) Exemptions (Generation): Using the provisions in the Electricity Act, PUCSL requires to exempt all (i) standby generators and (ii) renewable energy-based off-grid generating systems (stand-alone units such as solar panels and isolated mini-grids such as a

community hydropower facility), using the provisions in Section 10 of the Act, but establish a mechanism to ensure that information about the capacity and energy output of such facilities are reported to PUC, and that safety procedures and codes of practice are followed.

(d) Special considerations (off-grid distribution systems): Licensing the large number (reported to be over 300) of community mini-grids, and tariff filings, would be difficult both for their operators and to the PUC. A simplified mechanism to implement light-handed regulation to such community networks should be formulated.

4.3 Publication of Information

The Act has specific provisions to specify information disclosure to be included in all licenses. The specific recommendations are the following. All information should be published in a web site managed by PUCSL, and selected information may be published in printed form:

(a) Generation Licensees: For each power plant, monthly total energy and maximum capacity delivered, water (for hydropower plants) or fuel used, operating hours, planned and forced outage hours, reliability indices, total manpower, power plant net efficiency, accidents and safety violations

(b) Transmission Licensees: Monthly inflow and end-of-month level in each reservoir, water value calculation, energy purchases and sales, transfer price of energy from each power plant to the grid (separated into capacity, fuel and maintenance charges), applicable merit order in plant dispatch, partial and total outages of the transmission system, frequency excursions, technical and investigative reports on major events affecting distribution licensees, reliability indices, network losses and targets, accidents and safety violations

(c) Distribution Licensees: Reliability and customer service indices (actual and targets), energy purchases and sales, demand, number of customers, network losses (actual and targets), accidents and safety violations

(d) Immediate measures: PUCSL should request the licensees to publish available information (CEB statistical digest, Sales and Generation Data Book, and similar information from LECO and other generation licensees, and the annual reports of CEB and LECO), as a first step towards transparency of operations and transactions in the industry. Presently these documents are published but they are not in the public domain with easy access to the public.

4.4 Electricity Pricing

As provided in Section 30 in the Act, PUCSL should request transmission and distribution licensees to (a) develop and submit a plan to move from the present tariff structure to a cost-reflective tariff structure, this transition being allowed to occur over a period of five years (b)submit the first tariff filing by a stipulated date, preferably within one year from the date of the Act becoming operational (ie April 2010).

PUCSL should establish the templates for tariff submissions by the licensees and a time table for tariff submissions, public review and announcement. A practice of revising the tariffs after the due process once a year on a fixed date would be ideal, and with the current schedule of

activities, the ideal date for the first tariff revisions after the due process under the Electricity Act would be 1st July 2010.

4.5 Consumer Protection, Safety and Quality of Supply

(a) PUCSL should expeditiously review the safety manuals of all the licensees, approve and publish the same.
(b) The appointment and training of safety inspectors need to be expedited, and their defined roles should match with the provisions in the approved safety manuals, both in regular activities and in the case of accidents.
(c) The reporting of consumer complaints for regular supply interruptions require to be improved by all the distribution licensees (presently the quality of response and follow-up actions vary from place to place even within the same distribution licensee's area, with no standard complaints handling mechanism).
(d) A mechanism to handle special complaints such as (i) regular blackouts (ii) regular brownouts (iii) damage to equipment caused by poor supply quality, should be well publicised, through the licensees' media as well as by PUCSL.

4.6 Engagement of the Public

(a) The PUCSL Act under section 29 requires the Commission to establish a Consumer Consultative Council, to actively engage with PUCSL and the licensees, on all aspects of the regulatory process involving consumers. PUCSL requires to make the council effective and active, to ensure the engagement of consumers from the early stages of the regulatory process.
(b) PUCSL requires to immediately launch a publicity campaign, extending much further than the occasional press briefing held at present, to educate the public on PUCSL's role in the electricity industry, consumer rights/obligations, and the procedure for reconciliation of disputes.
(c) It is necessary to educate the stakeholders, including their licensees, about their rights and obligations under the new licensing regime.
(d) PUCSL should hold public consultations on the plans of licensees and tariff proposals. Until the tariff proposals are ready (as they are like to take some time), CEB transmission licensee already has generation and transmission plans, and the four CEB distribution licensees already have distribution plans, which have to be submitted to PUCSL under section 65(2) of the Electricity Act, and be subject to public consultations.

5 BEYOND THE NEW ELECTRICITY ACT – POLICY AND STRATEGY

5.1 Policy Recommendations for Improvement of Sector Performance

As mentioned previously, the Electricity Act has kept provisions for the political authority to provide the policy guidelines to the sector. This is an important aspect of governance, as policies need to be formulated by the government, consistent with its overall policies towards the development of the country.

However, through this and some other specific conditions, the Act has retained some of the controls the Minister has over the electricity industry. In some of the most important regulatory actions, the concurrence of the Minister has been made mandatory. Almost all actions in relation to licensees (from granting to cancellation), tariff setting and declaration of regulations are either directly or indirectly subjected to the control of the Minister. Safeguarding the interest of the general public may have been the *bona fide* intention, though a chance for politicisation creeps in through these provisions. Therefore, it is quite important for the executors of the Act, including the political authority, to be careful not to set undesirable precedence which can be detrimental to the independent performance of the industry.

Considering that policies can vary from a broad objective nature to a narrow and specific nature, the level of interference the political authority can exert through policy guidelines are almost unlimited. On the other hand, the nature of the industry demands clear and steady long-term policies, as the implementation of electricity sector policies and projects are long term and far reaching. For example, the political authority can set a tariff policy guideline, which is impossible for the licensees to comply with, considering the generation portfolio, sales and the prevailing consumer mix. In such situations, unless PUCSL ensures the necessary flow of subsidies, cost and price mismatches would create a situation similar to what the electricity industry is in today. Therefore, unless the policy is consistent with the reality, a sustained development of the electricity industry cannot be expected even through the new Act.

5.1.1 Energy Policy

In year 2008, the National Energy Policy was published by the government, which incorporated the following policy elements to match the energy needs of the country.

- Provision of basic energy needs
- Energy security
- Promotion of energy efficiency
- Energy pricing
- Energy sector management
- Consumer protection and transparency
- Quality of energy supply
- Environment protection

The above policy elements are applicable to electricity, petroleum products and biomass, which are the three main forms of energy used in Sri Lanka. It is noted that the coverage and the contents of the new Electricity Act are consistent with the National Energy Policy. In fact, the formulation of the National Energy Policy and finalising of the Electricity Act happened in parallel, with each complementing the other. In this context, there is no specific requirement to modify the existing policy on electricity. Further, unless the existing policy is changed or intentionally misinterpreted, the risk of political interference through policy guidelines is minimum. For example, the energy pricing policy clearly identifies the need for cost reflective pricing for the financial viability of the utilities (licensees). The need for targeted subsidies mentioned in the energy policy is also consistent with the provisions in the electricity act to

set tariff on cost recovery basis either through charges or subsidies. Similarly the energy policy categorically identifies the role of PUCSL in ensuring the implementation of the optimal electricity supply plan and the standards of electricity supply quality.

5.1.2 General Policy towards the Operation of the Electricity Sector

As discussed above, regulatory and policy frameworks are already in place for an optimal operation of the electricity industry. However, the risk of these frameworks being overlooked by the political or administrative structure remains a potential risk. Therefore a general policy to strictly adhere to this well-defined framework is essential. Such a blanket policy is needed by the government to counter the lobbying and pushing by different interest groups appearing from time to time and either retarding or deviating the progress of the sector. While regular reviews and feedback on the electricity policy and its operation are needed, any changes have to be in compliance with the set out framework defined by the policies, acts and procurement procedures.

A similar strategy needs to be adopted in terms of handling industry players such as the CEB, at least during the initial stages, to ensure the compliance with the new Act. This is needed considering the scale and the market share of CEB. A similar situation is observed between the Sri Lanka Sustainable Energy Authority and the CEB where the latter failed to comply fully, with the conditions provided in the SLSEA Act for all persons engaged in using a renewable energy resource to obtain a Permit. As such, all the sixteen hydropower plants owned and operated by CEB are presently operating without a Permit, and therefore illegal. In such instances, unless stern action is taken, precedences can be created hampering the entire regulatory process.

5.2 Necessary Amendments to the Act for Better Results

Attached to the Electricity Reform Act of 2002, there was much wide-ranging expectation, which eventually counteracted against itself, preventing its implementation. Compared with the excitement and expectations create by that Act, the reforms envisaged under the new Electricity Act are relatively mild and considered to be a compromise to the earlier. However, the essence of the matter is the change to the status quo. It may be less drastic than the Reform Act. Still the very fact of bringing the electricity industry under an independent regulatory framework itself promises much.

A key reason for the wider acceptance of the new Electricity Act in contrast to the Electricity Reform Act of 2002 is its mild nature of institutional reforms. Even those who strongly advocated reforms, including the donor community, are favourable on these non-dramatic changes, either considering these as a first step towards greater changes or understating the importance of evolution over revolution.

However, the restricted participation of the private sector and the overall control the political structure has over the industry needs to be changed. As of now, very little provisions are available for the private sector to enter the electricity industry.

Without private sector participation, especially in power generation and distribution, a fully competitive market cannot be expected, thus reducing the chances of improved efficiency, customer service and accountability. Further, the attraction of private sector equity to the electricity industry will be constrained by theses conditions. Not long ago, Sri Lanka was banking on private sector investments for almost all new power generation projects. the country ended up with nine oil-burning private power plants, when the long-term plans consistently recommended coal and hydropower plants to manage the costs. It is almost a complete turn-around from this position which too is not conducive for the development of the sector. Hence, amendments to the clauses preventing or restricting the participation of the private sector are recommended. Such changes made effective once other industry regulations are fully operational, would attract even more interest among the private sector, as private investments freely flow to structured markets where market risks are minimum.

In addition, the need for CEB to be more accountable for their action as well as inaction has to be incorporated into the Act. With the CEB being allowed to carry on its business without any external competition or challenges can again induce complacency to the organisation. Having regulatory powers to regulate one large CEB would put PUCSL in a hopeless situation unless functional divisions within the CEB start operating as different profit centres. If this does not happen automatically, amendments to the Act would have to be introduced to compel CEB for such changes.

Once the presently specified level of regulation is implemented within the industry, the prospects of introducing full immunity from political authority can be considered. Once the electricity sector demonstrates its ability to be independently regulated and adequate trust is built over the role of the regulator (the PUCSL) such changes are likely to have little resistance to be incorporated to the Electricity Act.

6 CONCLUSIONS

The Electricity Act of 2009 provides the framework for implementing comprehensive regulatory reforms but minimal structural reforms required to transform the electricity supply industry of Sri Lanka required to deliver services to customers. The Act represents the minimum requirements of a modern society, which demands transparency and fairness to be visibly practiced by all service providers, and more importantly, the monopolies. Certain segments of the electricity supply industry are natural monopolies, such as the transmission network, but many opportunities remain to establish a competitive market within such limitations.

What does the electricity customer expect as the outcome of the new Electricity Act ? As of now, he would probably have noted that there were some protests against the Act, and only a minority would know that the Act is operational. A customer's first priority is a reliable electricity supply, at a regionally competitive price. He needs a regulator who gives a patient hearing to a range of complaints or comments he would like to make, ranging from a complaint on inaction of CEB on his application for a new service connection to a comment on which primary sources Sri Lanka should use for electricity generation. The present structure of CEB and the previous Electricity Act have certainly not been able to fulfil this

basic requirement. Beyond this first priority of the customer, other issues such as who owns CEB or an IPP, whether a market player holds a license or not, and whether the long-term plan was adhered to in ordering new power plants, are only of academic interest to a customer who already has an electricity connection.

The priority of a customer who has no access to electricity would be one basic question: when will I be given access ?

The success of the Electricity Act depends on whether the basic requirements of customers and prospective customers, namely access, reliability and affordability, can be fulfilled to a much greater level of satisfaction than before. All the three parameters can be measured and compared, against each other and against what other countries have achieved. PUSCL requires to exert its authority and implement its mandate to facilitate this transition.