

Performance Report of Distribution Licensees

2013



Public Utilities Commission of Sri Lanka

08th July 2014

Nomenclature

CEB	-	Ceylon Electricity Board
DL	-	Distribution Licensee
DL1	-	Distribution Licensee CEB Region 1
DL2	-	Distribution Licensee CEB Region 2
DL3	-	Distribution Licensee CEB Region 3
DL4	-	Distribution Licensee CEB Region 4
FAC	-	Fuel Adjustment Charge
G.P.	-	General Purpose
GWh	-	Giga Watt hour
kVA	-	kilovolt ampere
kWh	-	kilowatt hour
LECO	-	Lanka Electricity Company Private Limited
LKR	-	Sri Lankan Rupee
Mil.	-	Million
MVA	-	Mega Volt Ampere
PUCSL	-	Public Utilities Commission of Sri Lanka
TL	-	Transmission Licensee

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1 Introduction

Performance of each distribution licensee for the year 2013 was analyzed with the aid of data submitted by each licensee. Total of **10.4 billion units*** have been consumed by the **5.6 million** consumer accounts connected to distribution network.

DLs have purchased electricity from Transmission licensee and distributed to consumers consist of five main categories namely Domestic, Religious, Industrial, Hotel and General Purpose. Revenue obtained from distribution business amounts to **162 billion Rupees**** for the period of 2013.

The consumer mix is depicted in the Figure 1.1.

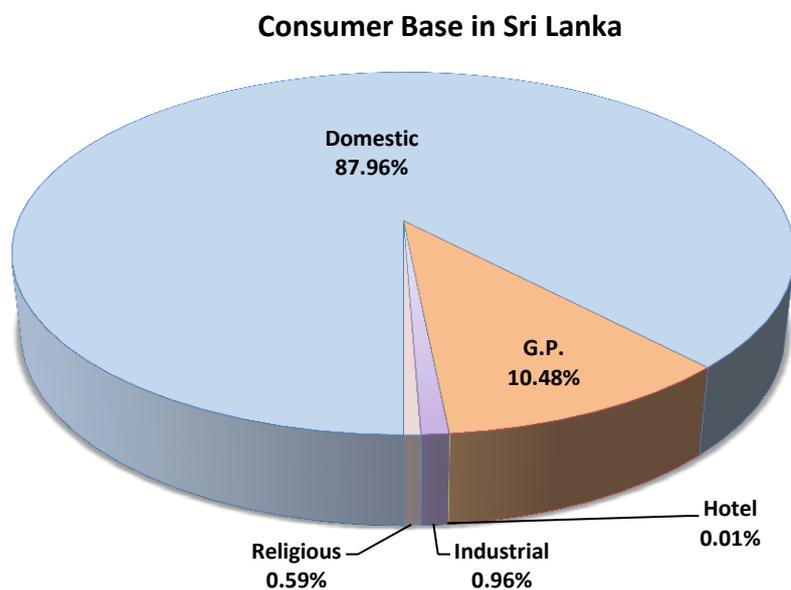


Figure 1.1: Category Wise Consumer Base (Average)

This report produces comparative illustration of all five DLs on their purchases, sales, revenue, consumer base and energy losses for the period starting from January 2013 to end of December 2013, with the objective of disseminating the electricity sector information to all stakeholders including the general public. Facts and figure given in this report based on the data submissions by each DL through Licensee Information Submission System.

* Considering invoiced sales.

** Excluding FAC

2 Energy /Capacity Purchased

Each DL purchases their electricity from the Transmission Licensee who is doing the bulk supply operation business. Table 2.1 given below provides the energy purchased according to the time of use. “Day”, “Peak” and “Off-Peak” periods span for 13 hours, 4 hours and 7 hours respectively.

	Day	Peak	Off-Peak	Tot	%
CEB Reg 1	1,822	709	667	3,197	27.6
CEB Reg 2	1,989	751	768	3,508	30.3
CEB Reg 3	1,172	463	401	2,036	17.6
CEB Reg 4	861	340	331	1,532	13.2
LECO	757	260	291	1,308	11.3
Tot	6,600	2,522	2,458	11,581	100.0

Table 2-1 : DL Wise Energy Purchased According to Time of Use (GWh)

Following table provides the energy demanded per hour (or average demand in MW) by TL from DLs. It can be seen that highest average demands for all three time periods are from DL2 and lowest values are from LECO.

	Day	Peak	Off-Peak
CEB Reg 1	384	485	261
CEB Reg 2	419	514	301
CEB Reg 3	247	317	157
CEB Reg 4	181	233	130
LECO	160	178	114
Tot	1,391	1,728	962

Table 2-2 : Average Demand by DLs (MW)

Coincident maximum demand given in following table describes the demand claimed by each DL during the occurrence of national peak demand.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	%
CEB Reg 1	493	535	520	560	519	525	517	509	547	534	494	530	525	27.6
CEB Reg 2	552	539	566	569	559	546	545	556	543	618	581	597	555	29.2
CEB Reg 3	406	336	369	361	312	220	249	265	277	300	207	255	334	17.6
CEB Reg 4	268	285	276	280	273	254	263	263	221	242	264	276	273	14.3
LECO	209	218	219	228	212	201	205	201	210	209	207	210	214	11.3
Total	1,928	1,911	1,949	1,998	1,875	1,746	1,779	1,794	1,797	1,903	1,753	1,868	1,901	100.0

Table 2-3 : Monthly Coincident Maximum Demand (MW)

3 Energy Sales

Total energy consumed by each consumer category is given below. Domestic and Industrial components carry a share of 38% and 34% of the electricity consumption of consumer categories, respectively. Energy sales depend on consumer mix and the number of consumers, where these parameters vary among DLs. Therefore it is worthwhile to look at the distribution business with respect to consumer mix.

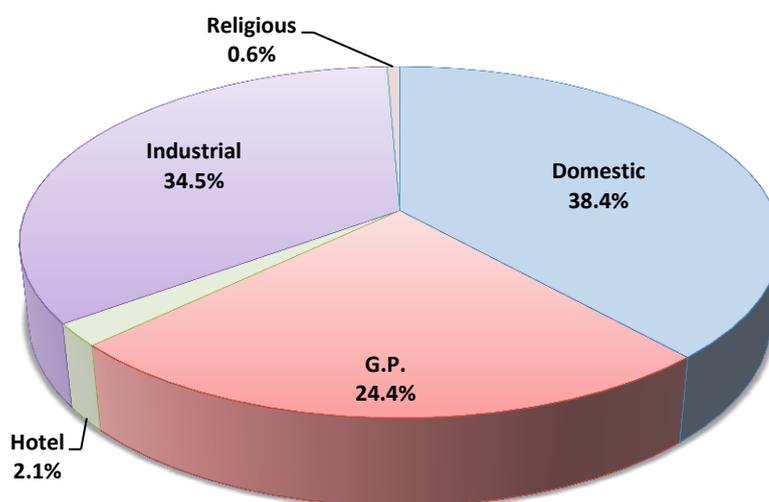


Figure 3.1 : Total Electricity Consumed by each Consumer Category

3.1 Consumer Category wise Sales

	Domestic	G.P.	Hotel	Industrial	Religious	Total
CEB Reg 1	1,001.8	1,074.7	84.4	700.9	22.7	2,885
CEB Reg 2	1,155.0	498.2	42.3	1,386.5	17.5	3,099
CEB Reg 3	715.6	305.8	5.9	835.0	9.3	1,872
CEB Reg 4	613.4	264.0	38.5	427.0	8.6	1,352
LECO*	511.9	391.9	45.1	240.6	8.6	1,222
Total	3,998	2,535	216	3,590.0	67	10,429

Table 3-1: Consumer Category wise Energy Consumption (GWh)

From the table 4.1, following information can be extracted.

Consumer Category	Highest consumption (GWh)	Lowest Consumption (GWh)
Domestic	CEB Reg 2 (1155)	LECO (511.9)
Religious	CEB Reg 1 (22.7)	LECO (8.55)
Industrial	CEB Reg 2 (1386.5)	LECO (240)
Hotel	CEB Reg 1 (84.4)	CEB Reg 3 (5.9)
General Purpose	CEB Reg 1 (1074.7)	CEB Reg 4 (264)

Table 3-2 : Highest and Lowest energy demand from each category

Category Wise Energy Sales (GWh)

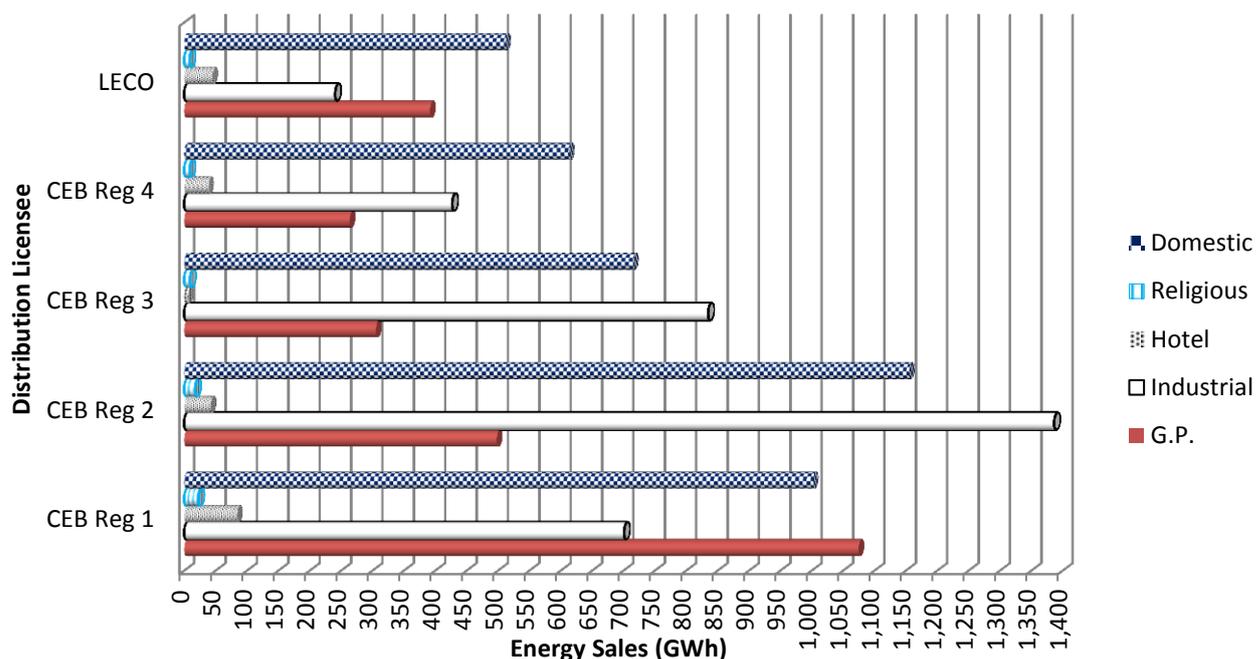


Figure 3.2 : Consumer Category wise Electricity Sales

3.2 Electrical Energy Demand per Consumer Account

Following table shows that average LECO consumer is the highest energy consumer of all DLs, while DL3 is having the average consumer with lowest consumption.

	Domestic	Religious	Industrial	Hotel	G.P.	All
CEB Reg 1	70	595	57,562	2,554	181	174
CEB Reg 2	64	237	24,702	8,506	148	153
CEB Reg 3	59	242	7,453	8,474	125	139
CEB Reg 4	64	272	33,316	6,110	164	126
LECO	99	432	79,653	5,727	295	199
National Average	68	360	37,944	5,541	167	155

Table 3-3 : Average Units (kWh) Consumed per Month per Consumer Account

4 Revenue

Revenue from electricity distribution business consists of following components.

Energy (kWh) charge

Maximum demand charge

Fixed charge

Fuel Adjustment charge

Note that revenue from FAC is collected by DLs and passed on to TL.

4.1 Revenue from Electrical Energy Sales

Following table depicts the energy charge distributed among each category. CEB Region1 had the highest share of revenue from all DLs .

	Domestic	G.P.	Hotel	Industrial	Religious	Tot
CEB Reg 1	11,602	21,352	1,192	7,862	150	42,158
CEB Reg 2	10,551	9,893	625	15,322	104	36,495
CEB Reg 3	6,330	6,102	113	9,280	52	21,876
CEB Reg 4	5,979	5,269	563	4,777	53	16,642
LECO*	7,530	7,985	661	2,721	63	18,985
Tot	41,992	50,600	3,154	39,962	422	136,130

Table 4-1 : Revenue from Energy Charge (LKR Mil.)

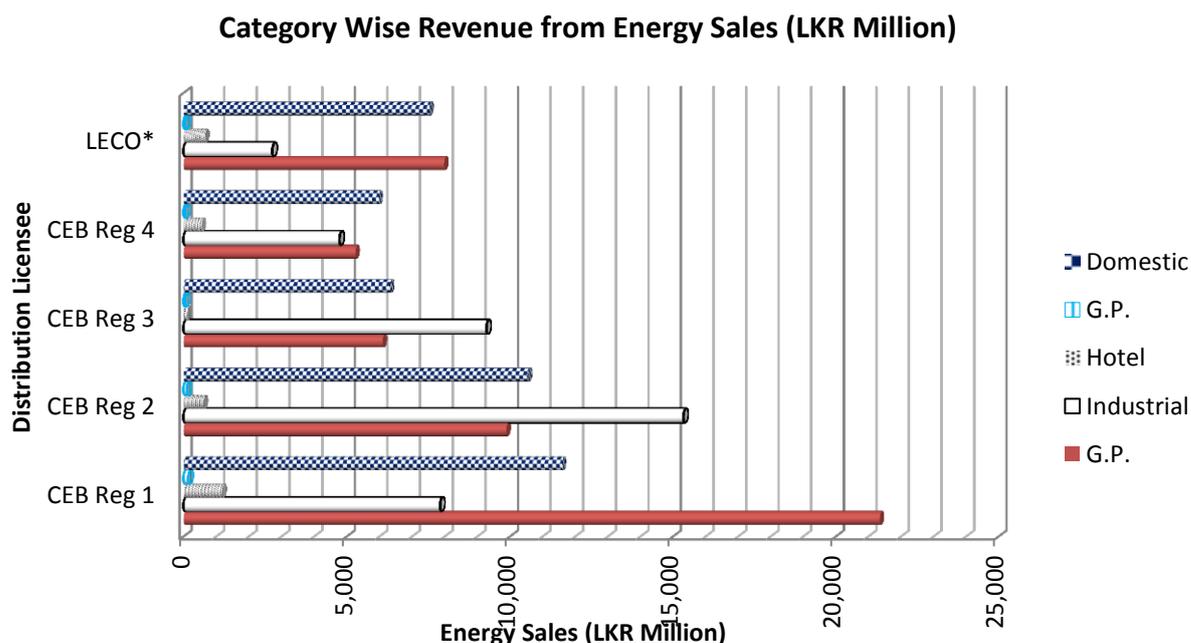


Figure 4.1: Revenue from Energy Charge

As it can be seen clearly from figure 5.1, the General Purpose consumers dominate the revenue of DL1, for DL 2 it is the revenue from Industrial consumers, for DL4 it is the revenue from Domestic.

4.2 Revenue from Maximum Demand Charge

In present tariff structure, maximum demand charge is applicable for following categories only.

Industrial ; in I-2 and I-3 sub categories

Hotel ; in H-2 and H-3 sub categories

General Purpose; in GP-2 and GP-3 sub categories

Licensee	G.P.	Hotel	Industrial	Tot
CEB Reg 1	2,466	185	2,137	4,788
CEB Reg 2	667	129	4,294	5,090
CEB Reg 3	550	19	2,489	3,057
CEB Reg 4	343	107	1,437	1,886
LECO	343	107	1,437	1,886
Tot	4,368	546	11,793	16,708

Table 4-2 : Revenue from Maximum Demand Charge

Category Wise Revenue from Maximum Demand Charge (LKR Mil.)

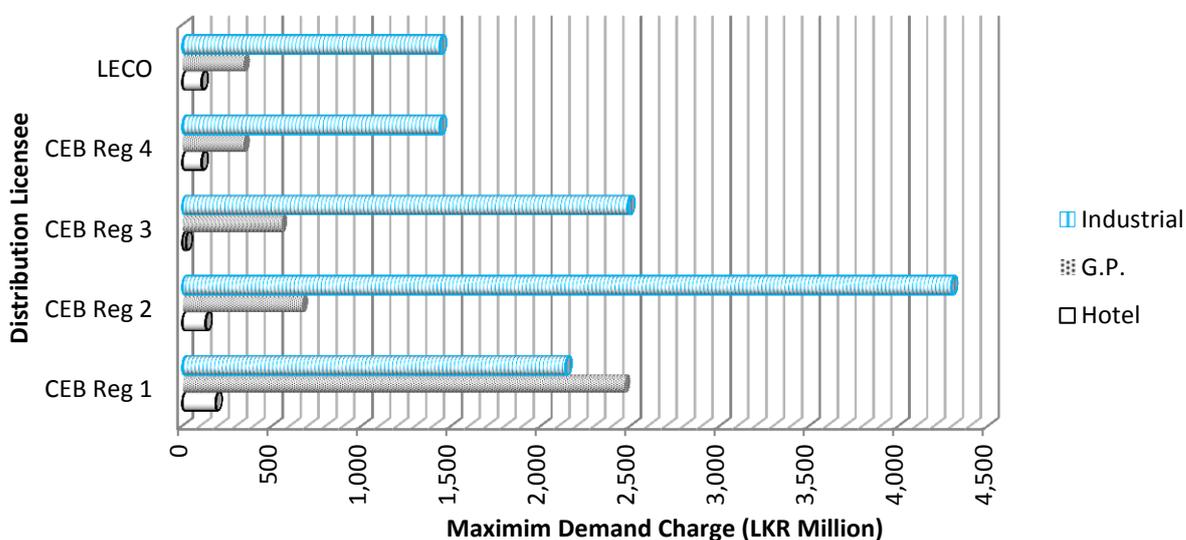


Figure 4.2 : Category wise Revenue from Maximum Demand charge (LKR Mil.)

4.3 Revenue from Fixed Charge

	Domestic	G.P.	Hotel	Industrial	Religious	Tot
CEB Reg 1	1,642	535.3	2	170.2	15	2,366
CEB Reg 2	2,010	537.9	3.1	120.1	15	2,686
CEB Reg 3	1,209	327.1	0.8	79.7	8	1,625
CEB Reg 4	1,043	250.1	2.6	57.4	7	1,360
LECO	978	164.8	2	33.6	5	1,182
Tot	6,883	1,815.2	10	461.0	50	9,219

Table 4-3 : Revenue from Fixed Charge (LKR Mil.)

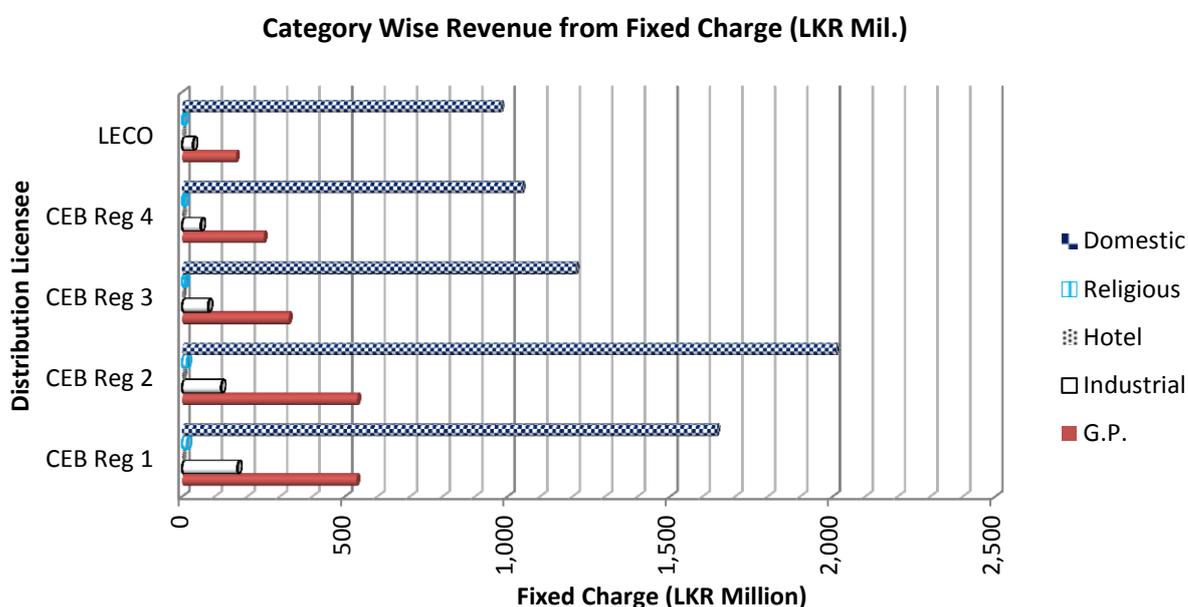


Figure 4.3: Revenue from Fixed Charge

It can be seen that about 75% of fixed charge revenue is from domestic category.

4.4 Fuel Adjustment Charge

Licensee	Domestic	G.P.	Hotel	Industrial	Tot
CEB Reg 1	4,030	5,154	179	1,179	10,543
CEB Reg 2	3,410	2,347	94	2,299	8,149
CEB Reg 3	2,085	1,684	22	2,276	6,067
CEB Reg 4	2,001	1,243	84	717	4,044
LECO	2,720	1,963	99	407	5,189
Tot	14,246	12,391	478	6,877	33,993

Table 4-4 : Fuel Adjustment Charge (LKR Mil.)

Fuel Adjustment Charge (LKR Mil.)

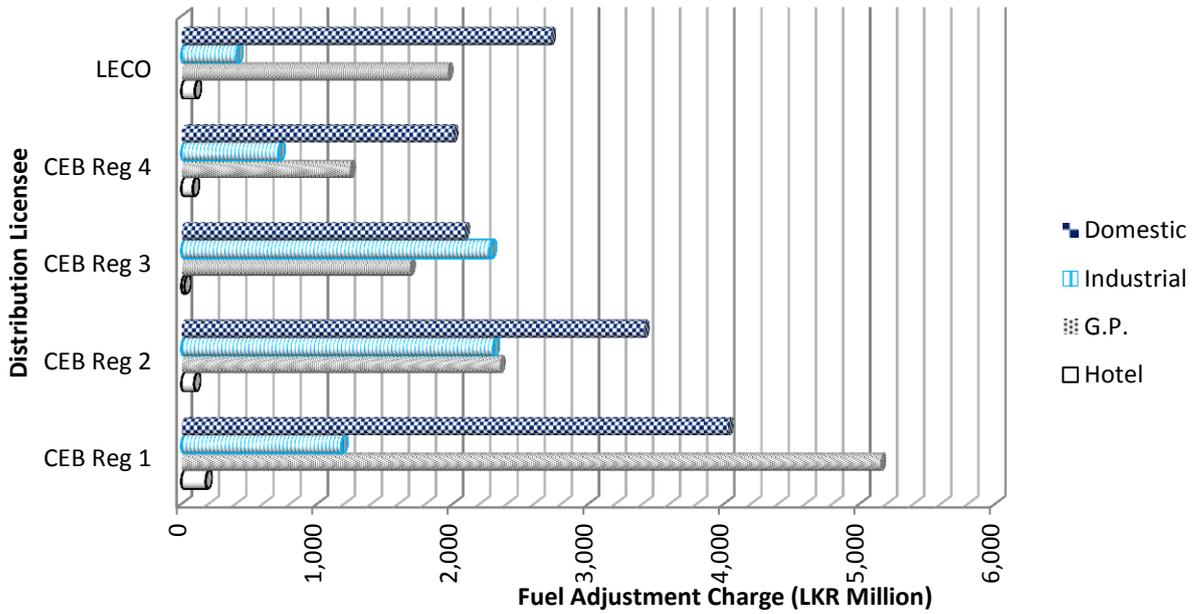


Figure 4.4: Fuel Adjustment Charge

4.5 Total Revenue (including FAC)

Licensee	Domestic	G.P.	Hotel	Industrial	Religious	Tot
CEB Reg 1	17,275	29,507	1,558	11,349	165	59,854
CEB Reg 2	15,971	13,445	851	22,035	119	52,420
CEB Reg 3	9,623	8,663	154	14,124	61	32,626
CEB Reg 4	9,023	7,105	757	6,988	60	23,932
LECO	11,228	10,455	869	4,598	67	27,218
Tot	63,120	69,174	4,189	59,094	472	196,074

Table 4-5 : Total Revenue (including FAC) from Distribution Business (LKR Mil.)

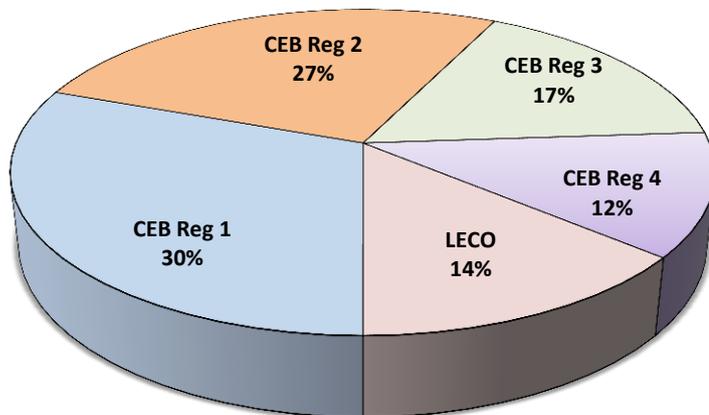


Figure 4.5 : DL wise Share of Revenue (including FAC)

4.6 Revenue per Unit of Energy Sold

Licensee	Domestic	G.P.	Hotel	Industrial	Religious	Avg.
CEB Reg 1	17.24	27.46	18.47	16.19	7.26	20.75
CEB Reg 2	13.83	26.99	20.10	15.89	6.80	16.91
CEB Reg 3	13.45	28.33	25.97	16.92	6.52	17.43
CEB Reg 4	14.71	26.91	19.63	16.36	6.95	17.71
LECO	21.93	26.68	19.27	19.12	7.89	22.27
National Avg.	15.79	27.29	19.37	16.46	7.08	18.80

Table 4-6 : Category wise Revenue per Unit of Energy Sold (including FAC)

5 Energy Loss

Following table depicts the energy loss in each DL and the allowed loss.

Distribution Licensee	Loss (%)*	Loss (%)**	Allowed for 2013	Loss (GWh)*
				2013
CEB Reg 1	9.8	8.4	8.6	313
CEB Reg 2	11.9	10.8	11.0	417
CEB Reg 3	8.4	7.7	8.6	171
CEB Reg 4	12.3	11.1	9.6	190
LECO	4.7	4.1	5.4	60

*According to the Invoiced Energy Sales and w.r.t. Energy Purchased

** Considering the estimated energy consumption of street lamps

Table 5-1 : Energy Loss in Distribution System

5.1 Energy Consumption for Street lighting

Only the LECO has provided the invoiced energy consumption of street lights which amounts to 23.96 GWh (About 1.9% of total invoiced sales of LECO). Reader must note that the loss figures for DL1, DL2, DL3 and DL4 includes the energy consumed by street lights in their respective areas of operation.

In the PUCSL document named “Decision on Electricity Tariffs 2013”, it has published the estimated energy consumption of street lamps as follows.

DL	Estimated Energy Consumption of Street Lamps (GWh)
CEB Reg 1	44
CEB Reg 2	38
CEB Reg 3	14
CEB Reg 4	19
LECO	31

Table 5-2 : Estimated Energy Consumption of Street Lamps

The table 5-3 illustrates a sensitivity analysis on percentage network loss according to the accuracy of the estimated energy consumption of street lamp.

Percentage Error in Estimated Energy Consumption of Street Lamps (%)	Corresponding Network Loss (%)				
	DL1	DL2	DL3	DL4	LECO
-50	9.1	11.3	8.0	11.7	5.4
-40	9.0	11.2	8.0	11.6	5.1
-30	8.8	11.1	7.9	11.5	4.9
-20	8.7	11.0	7.8	11.4	4.6
-10	8.5	10.9	7.7	11.2	4.4
0	8.4	10.8	7.7	11.1	4.1
10	8.3	10.7	7.6	11.0	3.9
20	8.1	10.6	7.5	10.9	3.7
30	8.0	10.5	7.5	10.7	3.4
40	7.9	10.4	7.4	10.6	3.2
50	7.7	10.2	7.4	10.5	2.9

Table 5-3 : Sensitivity analysis on network Loss w.r.t. estimated energy consumption by street lamps

6 Consumer Accounts

6.1 Consumer Mix

Distribution business involve about 5.6 million consumer accounts nationally. CEB Region 2 accounts for the highest percentage of consumer accounts and also having the second largest area of operation among all DLs.

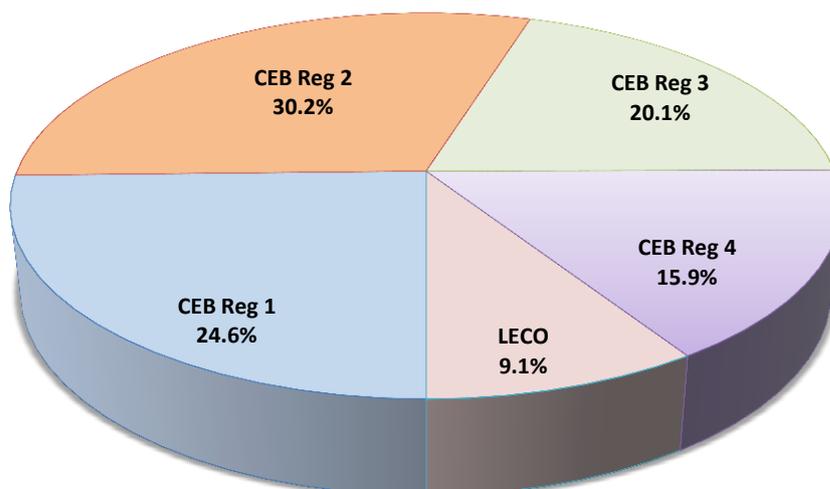


Figure 6.1 : DL Wise Consumer Accounts Base

	Domestic	G.P.	Hotel	Industrial	Religious	Total
CEB Reg 1	1,197,718	150,550	122	22,872	10,446	1,381,708
CEB Reg 2	1,493,721	174,964	143	13,584	9,851	1,692,263
CEB Reg 3	1,006,218	105,421	67	8,211	6,198	1,126,114
CEB Reg 4	802,817	80,899	96	5,824	4,377	894,013
LECO	430,788	75,611	47	3,500	2,419	512,365
Total Avg.	4,931,261	587,444	475	53,991	33,292	5,606,463

Table 6-1 : Category wise Consumer Mix (Average)

7 Conclusion

During the period of 2013, LECO has recorded the lowest network loss amounting to 4.7% and DL4 has exhibited the highest (12.3%). National distribution network loss has amounted to 1176.9 GWh (10.2%) , (considering the invoiced sales). Note that the results obtained on network losses depend on the accuracy of the energy meters installed.

Considering the consumer base of each DL, the LECO has to deal with the most energy intensive average consumer, consuming 199 units per month while DL4 has the lowest energy intensive average consumer consuming 126 units per month.

Total invoiced sales in 2013 amounts to 10,429 GWh which is an increase of 1.67% w.r.t. the year 2012. Number of consumer accounts has increased by 2.7% w.r.t. the year 2012. The average selling price of a unit amounts to **LKR 18.8**.