

Performance Report of Distribution Licensees

2012



Public Utilities Commission of Sri Lanka

10th May 2013

Nomenclature

BSOB	-	Bulk Supply Operation Business
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
LISS	-	Licensee Information Submission System
LKR	-	Sri Lankan Rupee
Mil.	-	Million
MVA	-	Mega Volt Ampere
PUCSL	-	Public Utilities Commission of Sri Lanka
TL	-	Transmission Licensee
w.r.t.	-	with respect to

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1 Introduction

Performance of each distribution licensee for the year 2012 was analyzed with the aid of data submitted by each licensee. Total of **10.3 billion units** have been consumed by the **5.5 million** consumer accounts connected to distribution network.

DLs have purchased electricity from Transmission licensee spending about **103 billion Rupees***, and distributed to consumers consist of five main categories namely Domestic, Religious, Industrial, Hotel and General Purpose. Revenue obtained from distribution business amounts to **167 billion Rupees** for the year 2012.

About **40%** of the electrical energy has been consumed by domestic consumers and 34% has been consumed by Industrial consumers, where the consumer mix is about **88%** and 1% for Domestic and Industrial consumer categories respectively.

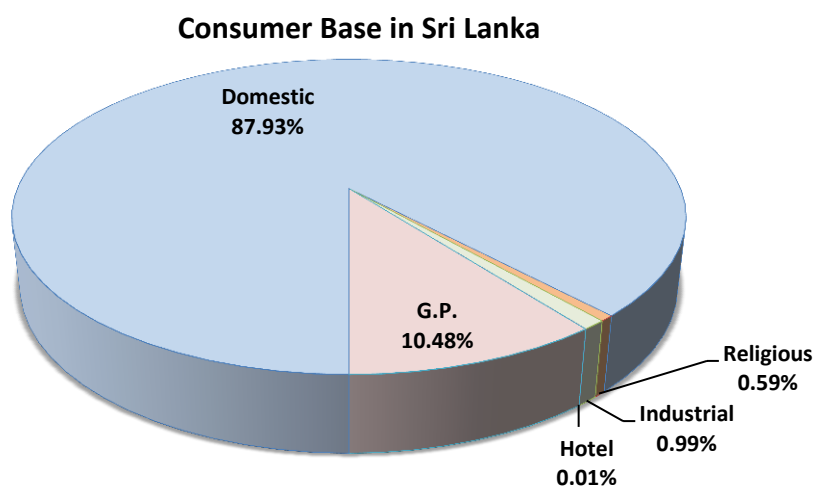


Figure 1.1: Category Wise Consumer Base

National electrical **energy loss** (technical and non-technical) in distribution network marked as **8.6%**** for the 2012, whereas 10.0% was recorded in year 2011.

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 2012 to end of December 2012. Facts and figure given in this report based on the data submissions by each DL through Licensee Information Submission System.

* Energy and Capacity cost

** when Estimated energy consumption (not invoiced) of street lights has taken as sales.

2 Energy /Capacity Purchased

Each DL purchases their electricity from the Transmission Licensee who is doing the bulk supply operation business. Relative to 2011 energy purchased has increased by 303 GWh, about 2.7% increase.

Table 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	879	345	320	1,544	27.7
CEB Reg 2	920	359	362	1,641	29.4
CEB Reg 3	583	248	210	1,041	18.6
CEB Reg 4	398	160	147	705	12.6
LECO	374	132	146	652	11.7
Tot	3,154	1,244	1,185	5,583	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	375	479	254
CEB Reg 2	388	488	285
CEB Reg 3	259	353	170
CEB Reg 4	171	226	118
LECO	157	180	113
Tot	1,351	1,726	941

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	531	514	520	515	521	518	478	508	504	513	505	527	513	26.3
CEB Reg 2	542	540	583	565	587	565	540	565	581	577	559	559	564	28.9
CEB Reg 3	376	414	388	372	369	391	400	395	344	379	349	374	385	19.8
CEB Reg 4	253	266	272	246	270	277	294	270	278	274	269	262	264	13.6
LECO	215	212	220	215	225	207	208	207	211	214	213	217	216	11.1
Total	1,916	1,947	1,984	1,912	1,972	1,957	1,919	1,945	1,917	1,957	1,893	1,938	1,948	100.0

Table 2.3 : Monthly Coincident Maximum Demand (MW)

3 Cost of Purchases

TL sells energy to all DLs. DLs have to pay the cost of kWh units according to the time of use, i.e Day (0530 to 1830 hrs), Peak (1830 to 2230 hrs) and Off peak (2230 to 0530 hrs). Further DLs have to pay a coincident maximum demand charge, which is the demand (MW) by DL coincide with national peak demand.

Prices of energy and coincident maximum demand have been set by PUCSL for each DL as given in the document published by PUCSL, *DECISION ON TRANSMISSION AND BULK SUPPLY TARIFFS (Effective from 1st January 2012)*.

3.1 Cost of Energy Purchased

	Day	Peak	Off-Peak	Tot	%
CEB Reg 1	14,694	7,235	4,023	25,952	35.4
CEB Reg 2	8,758	4,247	2,601	15,606	21.3
CEB Reg 3	6,974	3,663	1,848	12,485	17.0
CEB Reg 4	4,524	2,302	1,266	8,093	11.0
LECO	6,419	2,838	1,870	11,126	15.2
Tot	41,369	20,285	11,607	73,262	100.0

Table 3.1: DL Wise Cost of Energy Purchased according to Time of Use (LKR Mil.)

3.2 Cost of Coincident Maximum Demand

DL	Total	%
CEB Reg 1	7,883	26.5
CEB Reg 2	8,662	29.1
CEB Reg 3	5,832	19.6
CEB Reg 4	4,137	13.9
LECO	3,287	11.0
Total	29,802	100.0

Table 3.2 :DL Wise Cost of Coincident Maximum Demand (LKR Mil.)

3.3 Total Costs of Energy and Capacity Purchased

	Energy Cost	Capacity Cost	Tot
CEB Reg 1	25,952	7,883	33,835
CEB Reg 2	15,606	8,662	24,268
CEB Reg 3	12,485	5,832	18,317
CEB Reg 4	8,093	4,137	12,230
LECO	11,126	3,287	14,414
Tot	73,262	29,802	103,063

Table 3.3 : Total Costs of Energy and Capacity Purchased by each DL (LKR Mil.)

From Table 3.3, it can be seen that DL1 has paid the highest amount for distribution business to TL, while DL4 has paid the lowest to TL during 2012.

4 Energy Sales

Total energy consumed by each consumer category is given below. Domestic and Industrial components carry a share of 40% 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.

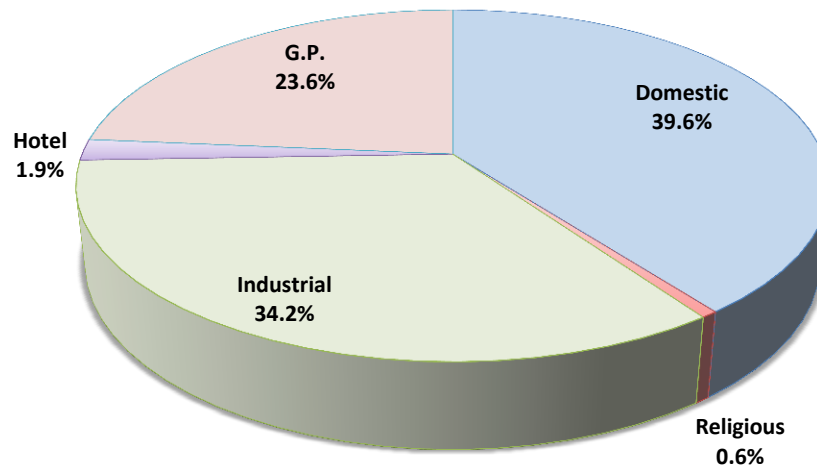


Figure 4.1 : Total Electricity Consumed by each Consumer Category

4.1 Consumer Category wise Sales

	Domestic	Religious	Industrial	Hotel	G.P.	Total	Increase*
CEB Reg 1	1,012	20.9	691	82.5	1,041	2,848	3.4
CEB Reg 2	1,118	15.8	1,325	35.8	453	2,948	5.0
CEB Reg 3	763	9.6	846	6.6	299	1,924	4.6
CEB Reg 4	626	8.2	403	35.4	246	1,319	5.0
LECO**	531	8.3	236	38.1	376	1,218	2.6
Total	4,050	63	3,501	198	2,415	10,257	4.4

*w.r.t. 2011 invoiced sales **Total Includes Invoiced energy consumption of Street Lights

Table 4.1 : Consumer Category wise Electricity Consumption (GWh)

From the table 4.1, following information can be extracted.

Consumer Category	Highest consumption (GWh)	Lowest Consumption (GWh)
Domestic	CEB Reg 2 (1118)	LECO (531)
Religious	CEB Reg 1 (20.9)	CEB Reg 4 (8.2)
Industrial	CEB Reg 2 (1325)	LECO (236)
Hotel	CEB Reg 1 (82.5)	CEB Reg 3 (6.6)
General Purpose	CEB Reg 1 (1041)	CEB Reg 4 (246)

Table 4.2 : Highest and Lowest Energy Demand from each Category

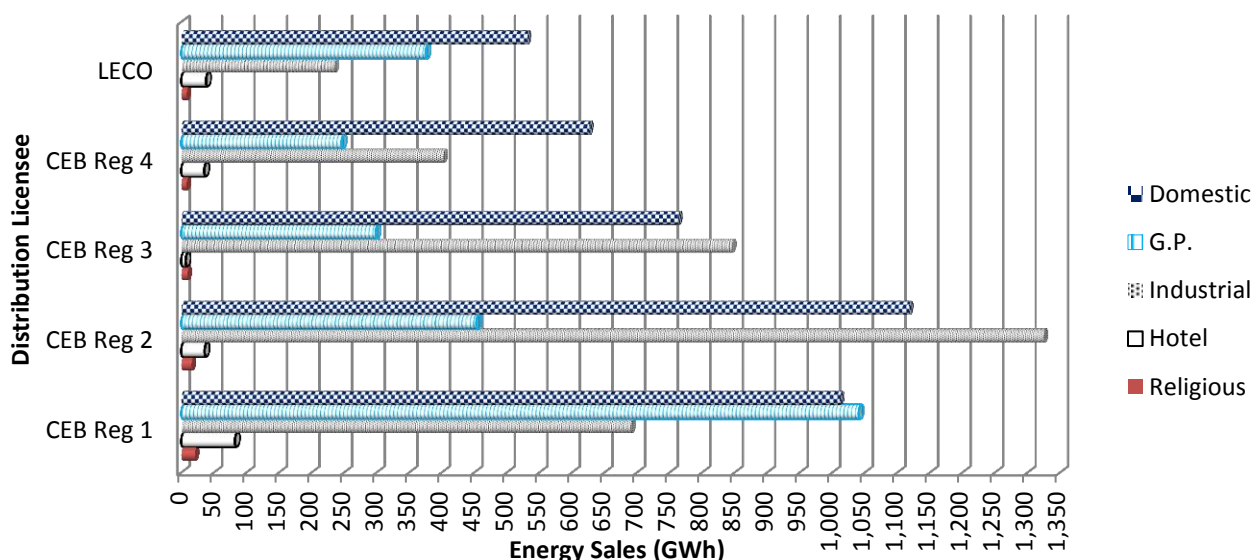


Figure 4.2 : Consumer Category wise Electricity Sales

4.2 Electrical Energy Demand per Consumer Account

Following table shows that average LECO consumer is the highest energy consumer of all DLs, while DL4 is having the average consumer with lowest consumption.

	Domestic	Religious	Industrial	Hotel	G.P.	All
CEB Reg 1	75	176	2,541	45,338	572	180
CEB Reg 2	68	149	8,379	30,736	234	158
CEB Reg 3	62	116	8,735	6,914	234	139
CEB Reg 4	67	165	5,939	28,888	266	127
LECO	107	297	6,296	74,637	483	211
National Average	71	326	11,073	69,864	717	159

Table 4.3: Average Units (kWh) Consumed per Month per Consumer Account

5 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.

5.1 Revenue from Electrical Energy Sales

Following table depicts the energy charge distributed among each category. CEB Region 1 had the highest share of revenue from all DLs amounting to 32 %. CEB Region 4 had the highest increase in of revenue compared to 2011(about 5.7%).

	Domestic	Religious	Industrial	Hotel	G.P.	Tot	% Increase*
CEB Reg 1	9,733	137	7,033	1,039	20,217	38,158	3.4
CEB Reg 2	8,030	95	13,391	462	8,821	30,799	4.8
CEB Reg 3	5,370	53	8,550	88	5,861	19,922	4.7
CEB Reg 4	4,868	50	4,093	456	4,809	14,276	5.7
LECO	6,206	61	2,423	486	7,310	16,513	3.4
Tot	34,207	396	35,490	2,530	47,018	119,641	4.2

Note: LECO total includes revenue from street lights. *w.r.t. 2011

Table 5.1: Revenue from Energy Charge (LKR Mil.)

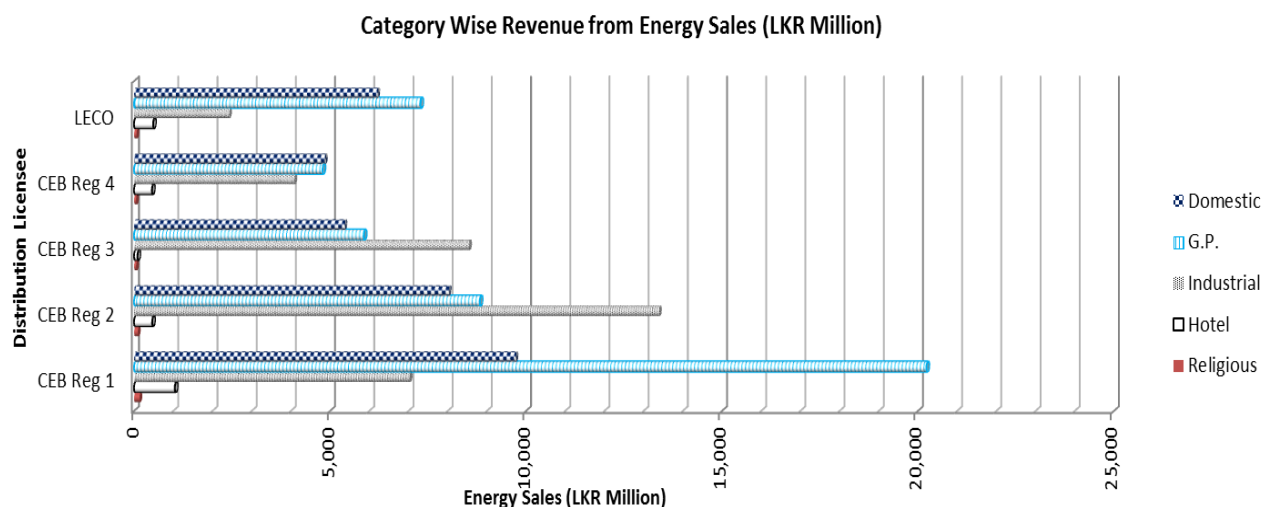


Figure 5.1: Revenue from Energy Charge

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 consumers and for LECO it is the General Purpose consumers.

5.2 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

	Industrial	Hotel	G.P.	Tot	% Increase*
CEB Reg 1	1,672	149	1,986	3,807	10.0
CEB Reg 2	3,348	89	473	3,910	6.6
CEB Reg 3	1,924	16	319	2,258	-5.8
CEB Reg 4	1,145	80	266	1,491	6.2
LECO	713	86	559	1,358	4.0
Tot	8,802	420	3,602	12,824	4.8

*w.r.t. 2011

Table 5.2 : Revenue from Maximum Demand Charge

For DL3, revenue from maximum demand charge has been reduced when compared with the 2011.

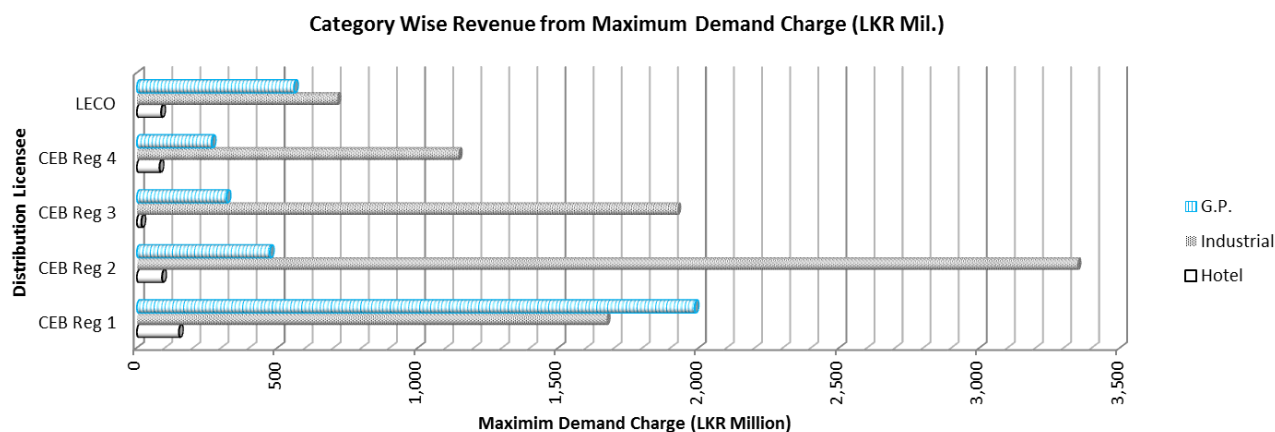


Figure 5.2 : Category wise Revenue from Maximum Demand charge (LKR Mil.)

5.3 Revenue from Fixed Charge

	Domestic	Religious	Industrial	Hotel	G.P.	Tot	% Increase*
CEB Reg 1	1,646	14	98	1.9	500	2,260	14.6
CEB Reg 2	1,978	13	81.4	2	478	2,553	3.9
CEB Reg 3	1,182	9	56.5	1	295	1,543	-1.7
CEB Reg 4	1,065	6	42.5	2	235	1,351	3.4
LECO	978	4	25	1.5	216	1,225	-0.7
Tot	6,850	47	304	9	1,723	8,932	4.6

*w.r.t. 2011

Table 5.3 : Revenue from Fixed Charge (LKR Mil.)

For DL3 and LECO, revenue from fixed charge has been reduced when compared with the 2011.

Category Wise Revenue from Fixed Charge (LKR Mil.)

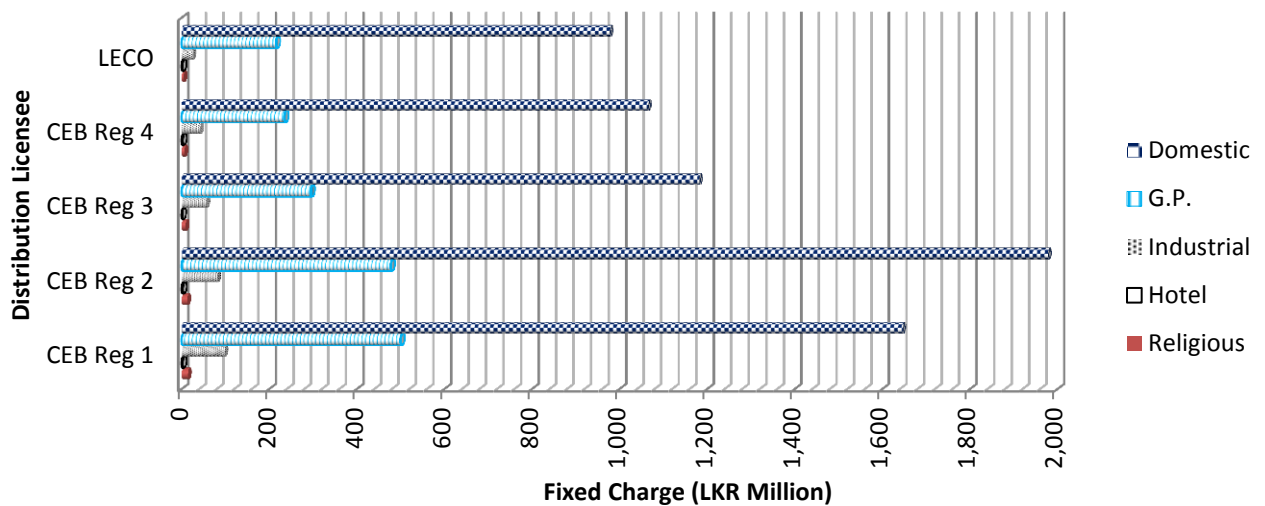


Figure 5.3: Revenue from Fixed Charge

It can be seen that about 77% of fixed charge revenue is from domestic category.

5.4 Fuel Adjustment Charge

Fuel Adjustment charge as a percentage of energy charge was imposed with effect from 16th February 2012. Religious category, Street lighting, Government schools and Government hospitals have been exempted from FAC.

Licensee	Domestic	Industrial	Hotel	G.P.	Tot
CEB Reg 1	3,140	880	131	4,036	8,188
CEB Reg 2	2,573	1,677	59	1,713	6,021
CEB Reg 3	1,698	1,112	11	1,151	3,972
CEB Reg 4	1,563	511	56	926	3,056
LECO	2,105	315	63	1,583	4,067
Tot	11,079	4,495	320	9,409	25,303

Table 5.4 : Fuel Adjustment Charge (LKR Mil.)

Fuel Adjustment Charge (LKR Mil.)

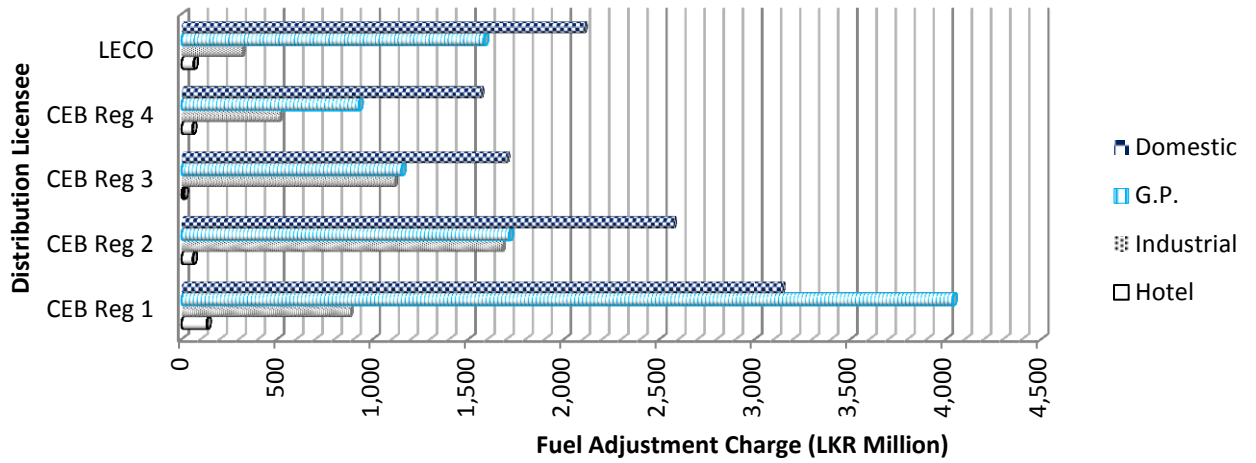


Figure 5.4: Fuel Adjustment Charge

5.5 Total Revenue

	Domestic	Religious	Industrial	Hotel	G.P.	Tot	% Increase ¹	% Increase ²
CEB Reg 1	14,519	152	9,683	1,322	26,738	52,413	23.8	4.4
CEB Reg 2	12,581	108	18,498	612	11,485	43,283	21.9	4.9
CEB Reg 3	8,250	62	11,642	115	7,626	27,695	20.4	3.1
CEB Reg 4	7,496	57	5,792	594	6,236	20,175	33.5	13.3
LECO	9,289	65	3,476	636	9,668	23,163	25.2	3.2
Tot	52,135	444	49,090	3,279	61,752	166,728	24.0	5.2

Note: LECO total includes revenue from Street Lights. 1 - Including FAC. 2 - Excluding FAC. 1,2-w.r.t 2011

Table 5.5 : Total Revenue from Distribution Business (LKR Mil.)

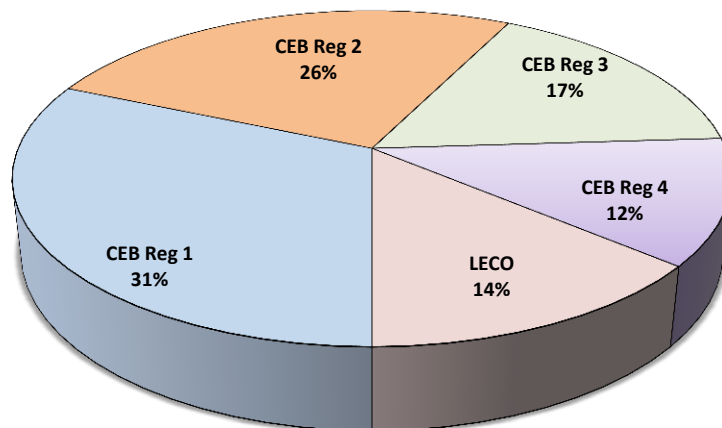


Figure 5.5 : DL wise Share of Revenue (including FAC)

5.6 Revenue per Unit of Energy Sold

	Domestic	Religious	Industrial	Hotel	G.P.	Avg.
CEB Reg 1	14.35	7.25	14.00	16.02	25.69	18.41
CEB Reg 2	11.26	6.81	13.96	17.11	25.33	14.68
CEB Reg 3	10.81	6.48	13.76	17.29	25.51	14.39
CEB Reg 4	11.97	6.92	14.39	16.81	25.30	15.30
LECO	17.49	7.89	14.73	16.71	25.74	19.01
National Avg.	12.87	7.06	14.02	16.53	25.57	16.25

Note: Considering total revenue including FAC

Table 5.6 : Category wise Revenue per Unit of Energy Sold

5.7 Sales Margin

	Sales Margin per kWh Purchased (LKR/kWh)*	Sales Margin per kWh Purchased (LKR/kWh) excluding FAC
CEB Reg 1	5.92	3.31
CEB Reg 2	5.78	3.95
CEB Reg 3	4.29	2.47
CEB Reg 4	5.49	3.38
LECO	6.72	3.60
Tot	5.60	3.38

* Revenue includes energy charge, Maximum demand charge and fixed charge

Table 5.7 : Sales Margin

6 Energy Loss

According to the invoiced sales during 2012, National electrical energy loss occurred in distribution network amounts to **1106 GWh or 9.7%** of energy purchased from TL. Energy consumption of street lights that has not been invoiced is included in aforesaid loss amount. If estimated energy consumption of street lights is taken into account, then the loss figure reduce to **980 GWh or 8.6%** of the energy purchased from TL. Table 6.1 shows the monthly average distribution loss figures for each DL.

Distribution Licensee	Loss (%)**				Loss (GWh)**		
	2012	2011	Reduction	Allowed* for 2012	2012	2011	Reduction
CEB Reg 1	7.7	7.5	-0.2	8.9	242.4	226.7	-15.7
CEB Reg 2	9.5	8.8	-0.7	11.8	312.0	274.1	-37.8
CEB Reg 3	11.5	17.0	5.5	8.9	251.3	379.7	128.4
CEB Reg 4	8.1	10.6	2.5	10.1	116.6	149.6	33.0
LECO	4.4	6.3	1.9	5.6	57.9	80.1	22.2

*Decision on Transmission and Bulk Supply Tariffs, Published by PUCSL

**Estimated energy consumption of street lights taken as sales.

Table 6.1 : Energy Loss in Distribution System

Only DL3 has not maintained average loss percentage below the figure imposed by PUCSL for the year 2012.

7 Consumer Accounts

7.1 Consumer Mix

Distribution business involve about 5.5 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. Further , CEB Reg 1 has the highest increase in consumer accounts w.r.t. 2011. Figure 7.1 and table 7.1 provides the category wise beakedown of consumer accounts.

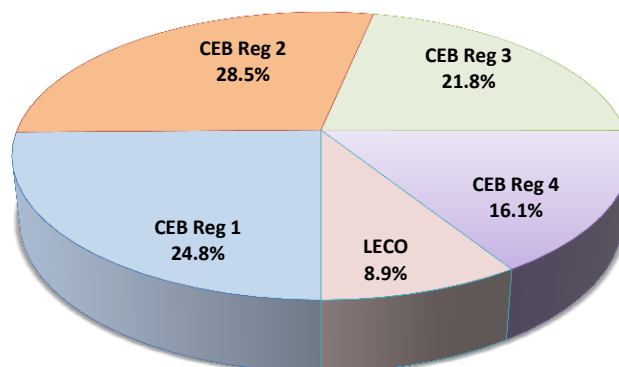


Figure 7.1 : DL Wise Consumer Accounts Base

	Domestic	Religious	Industrial	Hotel	G.P.	Total	% Increase*
CEB Reg 1	1,161,684	10,163	23,552	129	156,238	1,351,766	6.8
CEB Reg 2	1,372,995	8,842	13,176	97	161,472	1,556,582	4.6
CEB Reg 3	1,063,265	6,710	8,256	78	109,846	1,188,155	6.5
CEB Reg 4	787,691	4,251	5,731	93	78,822	876,588	3.5
LECO	415,534	2,343	3,117	47	66,096	487,137	2.6
Total	4,801,169	32,309	53,832	444	572,474	5,460,228	5.2

*w.r.t. 2011-December

Table 7.1 : Category wise Consumer Mix as at December 2012

7.2 Consumer Growth

Numbers of consumer accounts are increasing by **22,330** new connections per month. In average 123 new connections are providing daily by DLs. Table 7.2 and 7.3 illustrate the pattern of consumer growth w.r.t. year 2011.

	Domestic	Religious	Industrial	Hotel	G.P.	Total
CEB Reg 1	72,851	593	2,072	83	10,702	86,301
CEB Reg 2	57,929	366	467	39	9,035	67,836
CEB Reg 3	64,049	459	435	60	7,112	72,115
CEB Reg 4	25,068	228	207	39	3,847	29,389
LECO	9,188	51	-16	-10	3,108	12,321
Total	229,085	1,697	3,165	211	33,804	267,962

Table 7.2 : Increased number of consumer accounts in each category w.r.t. 2011-December

	Domestic	Religious	Industrial	Hotel	G.P.	Total
CEB Reg 1	6.7	6	10	180	7	6.8
CEB Reg 2	4.4	4.3	3.7	67.2	5.9	4.6
CEB Reg 3	6.4	7.3	5.6	333.3	6.9	6.5
CEB Reg 4	3.3	5.7	3.7	72.2	5.1	3.5
LECO	2.3	2.2	-0.5	-17.5	4.9	2.6
Total	5.0	5.5	6.2	90.6	6.3	5.2

Table 7.3 : Percentage increase in consumer accounts of each category w.r.t. 2011-December

8 Conclusion

During the period of 2012, all DLs except DL3 have managed to keep their network losses below the allowed losses stipulated by PUCSL. LECO has recorded the lowest network loss amounting to 4.4% and DL3 has exhibited the highest (11.5%). National distribution network loss has amounted to 1106 GWh 9.7% , which is of 1106 GWh (considering the invoiced sales). 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 211 units per month while DL4 has the lowest energy intensive average consumer consuming 127 units per month.

Analysis has revealed that DL2 had the highest sales margin(Excluding FAC) per energy unit they sold, amounting to LKR 3.95 and DL3 in the lowest side with a figure of LKR 2.47. Reader must note that this figure is influenced by consumer mix, and the authorized area of operation which are not in the control of licensees.

DL1 has provided the highest number of new connections per day (Averaged), while LECO is the lowest.

Following table summarizes some important aspects from each DL.

Licensee	Network Loss	Sales Margin per kWh Purchased	Average Units Consumed per Month per Consumer Account	Average Number of New Connections Provided per Day	Authorized Area of Operation*
	(%)	(LKR/kWh)	(kWh/Account/Month)		% of Total
CEB Reg 1	7.7	3.31	180	40	42.0
CEB Reg 2	9.5	3.95	158	31	24.5
CEB Reg 3	11.5	2.47	139	33	22.6
CEB Reg 4	8.1	3.38	127	14	10.4
LECO	4.4	3.60	211	6	0.6
National	8.6	3.38	159	123	

Table 8.1 : Important Aspects

Note:

Network Loss = {[Energy Purchased from TL] - [Invoiced Sales of DL] – [Estimated Energy Consumption of Street Lights]} / [Energy Purchased from TL]

Sales Margin = {[Energy Charge] + [Maximum Demand Charge] + [Fixed Charge]} – {[Cost of energy Purchased] - [Cost of Coincident Demand]}

Average number of new connections is an approximate value calculated using the number of accounts increased during the period 2012.

* Approximate