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ANALYSIS OF CONSUMPTION PATTERN AND CONTRIBUTION TO REVENUE OF POWER SECTOR IN INDIA

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ABSTRACT

The study attempts to understand the analysis of Consumption Pattern and Contribution to revenue of power sector in India. The study is descriptive in nature and covers the whole population for the period of 9 years i.e., 2006-07 to 2014-15 using secondary data from PFC reports. It covers state power utilities and state power departments in all the states as well as union territory and private distribution companies created as a result of reform measures. The study calculated averages of consumer wise sale of electricity and used average contribution of revenue of power sector. Further, percentages and graphs are used as necessary to make the study more appropriate and meaningful. The study has found that industrial consumers use a majority of electricity followed by domestic and agricultural consumers. Further, the industrial consumers contribute 36% of the total revenue whereas agricultural and domestic consumers are least contributors of revenue to total revenue. There is huge gap between the sale of electricity and the contribution of revenue in the utilities operating in India. It suggests that the utilities to improve the collection of revenue from the respective utilities. Awareness should be created at rural areas to implicit agricultural consumers for making contribution to revenue. Further, the utilities should increase the tariff of agricultural consumers and follow utilities which are successful in terms of revenue earnings.

Keywords: Power Sector, Power Distribution Utilities, Electricity, Revenue, Receivables, Debtors, Collection Efficiency.

1. Introduction

Revenue is an important element in the management of any business. When a business sells a product or delivers a service to its consumers, they either sell it on cash basis or credit basis. If the product or service is sold on cash, the finished product will be transformed into cash, resulting in a time lag between the sale of product/service and realization of cash from consumers. It is very important not only to sell a product / service but also to realize the revenue from consumers.

In power sector, the power distribution utilities levy different tariff for different set of consumers based on the purpose of usage of electricity. The revenue or cost of electricity used is collected from consumers after consumption of electricity. Due to the difference in the cost per unit of electricity charged to different segment of consumers depending on the purpose of usage. The commercial segment are charged hefty price whereas the household consumers are charged low. Further all the consumers from every segment may not pay their dues entirely or partially on time. Collection of revenue will have a direct effect on the financials of the utilities. Thus the management of revenue is very essential for the very survival of these utilities. Therefore, revenues should be managed effectively and efficiently to not only to survive but to sustain profitability.

2. Power Sector in India

India is one of the major energy producers and consumers in the world. It currently ranks as the world's seventh largest energy producer, accounting for about 2.49% of the world's total annual energy production and fourth largest consumer of electricity (Ministry of Statistics and Programme Implementation, 2014). It is the key source of input for the overall development of the economy as a whole and an indispensable infrastructure in any economy. Electricity is the basic requirement to run the business. In current scenario, most of the businesses are automated and run using electricity. Therefore, without electricity the businesses cannot operate their operation.

The power generating capacity in the country has grown manifold to 267 GW, while the total installed capacity of the state, central and private sectors are 95079 MW, 72521 MW and 104122 MW in the year 2014-15 respectively. Further, it caters to nearly 200 million consumers with a connected load of about 400 GW that places the country among the largest electricity consumer base in the world.

3. Background of the Study

Saxena & et al (2010) reported that the electricity distribution utilities in India are performing sub-optimally and need to be reorganized. Accodring to Narware, 2004, the gap between average cost and power supply charge has been increasing. Further, lack of proper consumer database is the biggest obstacle for discoms with respect to proper billing and collection of revenues in power distribution utilities (Balasubramanian .S, 2012). The largely state-owned utilities should raise tariffs in line with their costs, receive more compensation for the subsidies they provide to rural users and improve their accountability to regulators and consumers (Tommy, 2014). Further, only through regular monitoring the utilities can identify any distortions in their power and make informed decisions to improve its efficiency and impact, hence assuring the sector's financial sustainability.

4. Objective of the study

- To analyze the consumption pattern and contribution of revenue in power utilities operating in India.

5. Research Methodology

The study attempts to understand the analysis of Consumption Pattern and Contribution to Revenue of utilities of power sector in India. The study is descriptive in nature and covers the whole population for the period of 9 years ie, 2006-07 to 2014-15 using secondary data from Power Finance Corporation (PFC) reports. It covers state power utilities and state power departments in all the states as well as union territory of puducherry and private distribution companies created as a result of reform measures (Discoms in Delhi & Odisha). Only graphs are used to explain the consumption pattern and contribution to revenue to make the study more appropriate and meaningful.

6. Analysis and Interpretations

The analysis used average of breakup of sale in MkWH (%) to total sales and break up of revenue in rupees (%) to total revenue. The data was procured from different PFC reports where average values are calculated to understand the usage of electricity consumer wise and

contribution of revenue. Graphs are used to highlight the difference in the sale in MkWh to total sale and revenue to total revenue in terms of percentage.

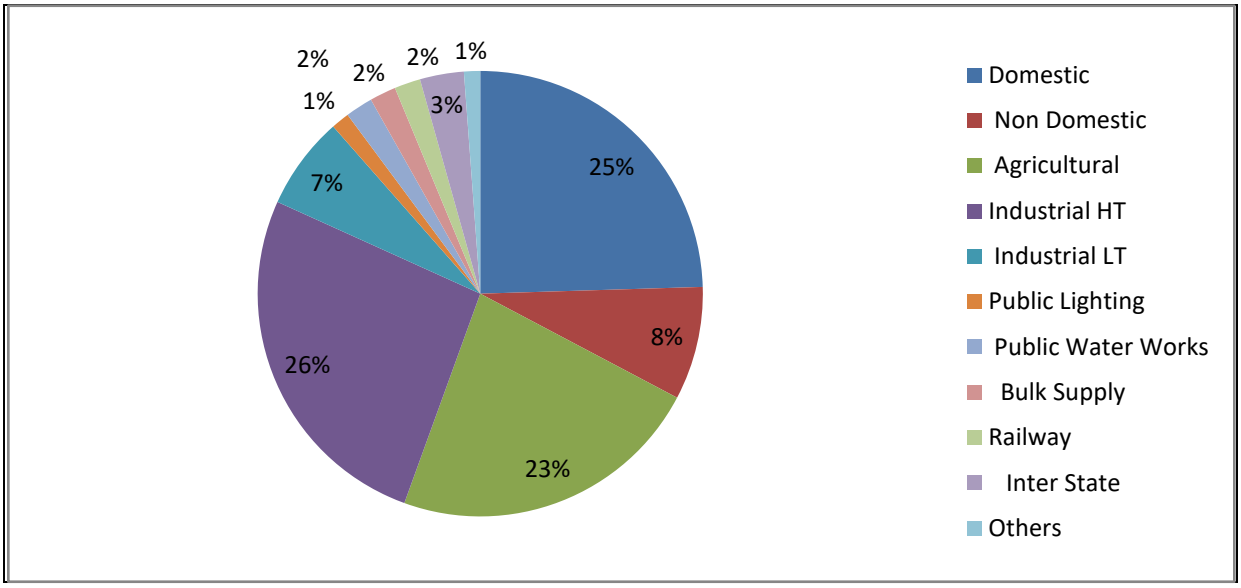
6.1 Consumers of Power Distribution Utilities

The consumer of power distribution utilities comprises of both commercial and non-commercials. They comprise of individuals, institutions and business organizations. The customers have been divided on the purpose and usage of electricity. The utility charges different prices for a different set of consumers based on the economic usage. The following are the classification of consumers based on usage. The low tension consumers are domestic, non-domestic, Industrial (Low Tension), cottage industries, agriculture, public bodies / local bodies, general purpose, and temporary users. High tension consumers are classified into industrial segregated category, industrial non-segregated category, irrigation and agriculture category, railway traction category, township and residential colonies category, RESCOS and temporary supply and revenue from sale of power to others (Discom to Discom, Interstate & UI Sales).

6.2 Break Up of Sale in Mkwh (%) to Total Sales

The Figure.1 shows the breakup of sale in Mkwh (%) to total sales. The industrial high tension consumers contribute to a major share in Mkwh to total sales followed by domestic consumers (25%), agricultural consumers (23%), non-domestic consumers (8%), industrial low tension consumers (7%), inter-state consumers (3%), railways consumers (2%), public water works consumers (2%), bulk supply consumers (2%), public lighting (1%) and other consumers (1%).

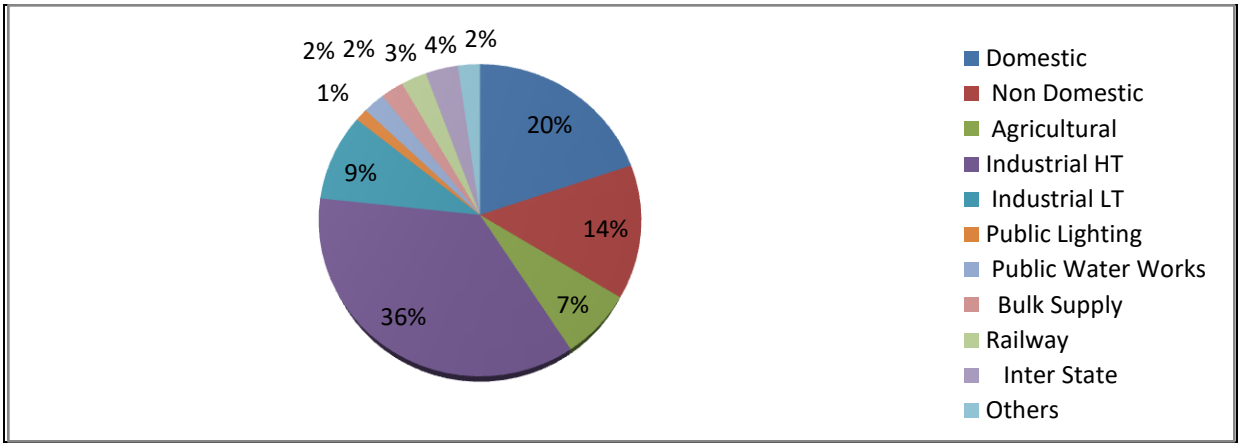
Figure 1: Average Break Up of Sale in Mkwh (%) to Total Sales for the period of 2007 - 2015



6.3 Breakup of Revenue in Rs. Crores (%) to Total Revenue

The Figure 2 shows that industrial high tension consumers contribute to 36% of the total revenue from consumers, followed by domestic consumers (20%), non-domestic (14%), industrial low tension consumers (9%), agricultural consumers (7%), inter-state consumers (4%), railway consumers (3%), and the rest of consumers (2%) respectively.

Figure No.2:Break up of Revenue in Rs. Crores (%) to Total Revenue for the period of 2007 - 2015



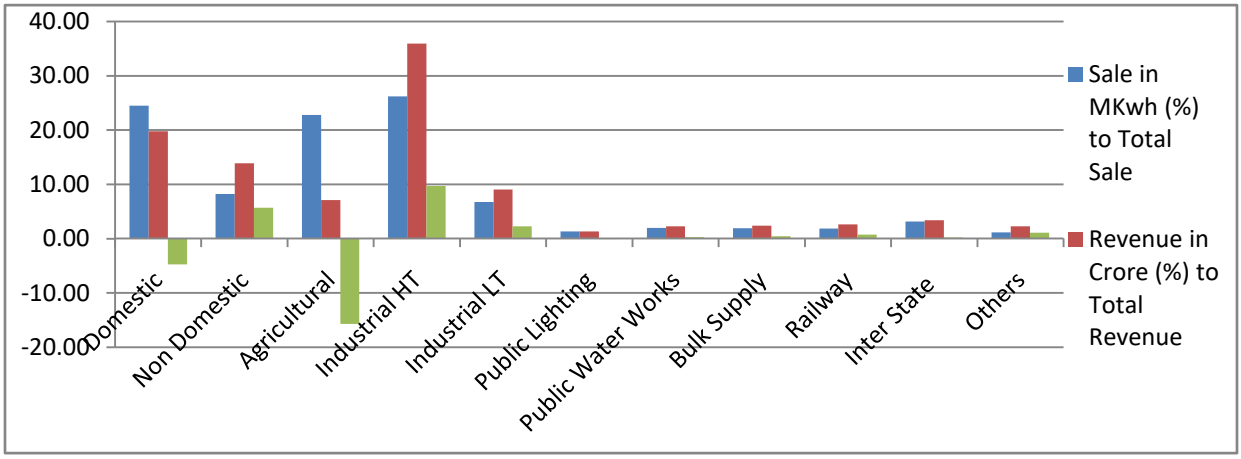
6.4 Comparison of Sale in Mkwh and Revenue in Crore (%) to Total Revenue

The figure 3 describes the consumer category wise sale of electricity in MkWh (%) to total sale and revenue (crore) to total sale.

Domestic Consumers: The domestic category of consumer's use 24.51% of total electricity sold but they contribute to 19.79% of revenue to total revenue. The difference between sale and revenue is -4.72%. This category of consumers are ranked 10th among the different category of consumers. The data shows that there is increase in the sale of electricity for the period of 2007-2015. It increased from 23.46% to 26.42 % of sales to total sales.

Non Domestic Consumers: The non-domestic category of consumers uses 8.22% of electricity but contribute 13.91% of revenue to total revenue. The difference between sale and revenue is 5.69%. This category of consumers are ranked 2nd among the different category of consumers. The data shows there is a increase in the sale of electricity for the period of 2007-2015. It increased from 7.62% to 8.5 % of sales to total sales.

Figure No.3 : Comparison of Sale in MkWh to Total Sale and Revenue in Crores to Total Revenue for the period of 2007 - 2015



Agricultural: The agricultural categories of consumers use 22.80% of electricity but contribute 7.09% of revenue to total revenue. The difference between sale and revenue is 15.71%. This category of consumers are ranked 11th among the different category of consumers. The data shows there is a decrease in the sale of electricity for the period of 2007-2015. It increased from 24.11% to 22.6 % of sales to total sales.

Industrial HT: The industrial high tension category of use 26.22% of total sales while they contribute 35.92% of revenue to total revenue. The difference between sale and revenue is 9.70%. This category of consumers are ranked 1st among the different category of consumers. The data shows there is a decrease in the sale of electricity for the period of 2007-2015. It increased from 28.52% to 23.88 % of sales to total sales.

Industrial LT: The industrial low tension category of use 6.75% of total sales while they contribute 9.05% of revenue to total revenue. The difference between sale and revenue is 2.29%. This category of consumers are ranked 3rd among the different category of consumers. The data shows there is a decrease in the sale of electricity for the period of 2007-2015. It increased from 6.96% to 5.8 % of sales to total sales.

Public Lighting: The public lighting category of consumers uses 1.32% of total sales while they contribute 1.32% of revenue to total revenue. This set of consumers generates the equal percentage of revenue for the electricity used. This category of consumers are ranked 8th among the different category of consumers. The data shows there is a no change in the sale of electricity for the period of 2007-2015. It increased from 1.38% to 1.31% of sales to total sales.

Public Water Board: The Public water board category of consumers uses 1.99% of total sales while they contribute 2.26% of revenue to total revenue. The difference between sale and revenue is 0.27%. This category of consumers are ranked 7th among the different category of consumers. The data shows there is a no change in the sale of electricity for the period of 2007-2015. It increased from 1.84% to 1.85 % of sales to total sales.

Bulk Supply: The bulk supply consumers contribute 1.91% of total sales and contribute 2.38% of total revenues. The difference between sale and revenue is 0.47%. This category of consumers are ranked 6th among the different category of consumers. The data shows there is a increase in the sale of electricity for the period of 2007-2015. It increased from 1.88% to 2.4 % of sales to total sales.

Railways: The railway category of consumers uses 1.89% of total sales while they contribute 2.64% of revenue to total revenue. The difference between sale and revenue is 0.75%. This category of consumers are ranked 5th among the different category of consumers. The data shows there is a decrease in the sale of electricity for the period of 2007-2015. It increased from 2.04% to 1.46 % of sales to total sales.

Inter State: The Inter-state category of consumers' use 3.19% of total sales while they contribute 3.38% of revenue to total revenue. The difference between sale and revenue is 0.19%. This category of consumers are ranked 8th among the different category of consumers. The data shows there is a increase in the sale of electricity for the period of 2007-2015. It increased from 1.91% to 3.96 % of sales to total sales.

Others: The other excluding the above mentioned category of consumer's use 1.17% of total sales while they contribute 2.27% of revenue to total revenue. The difference between sale and revenue is 1.09%. This category of consumers are ranked 4th among the different category of consumers. The data shows there is a increase in the sale of electricity for the period of 2007-2015. It increased from 0.24% to 2.08 % of sales to total sales.

The figure shows the sale in Mkwh (%) to total sale, revenue to total revenue and the difference arising from the sale and revenue in terms of percentage. The category of consumer's namely agricultural, domestic and public lighting contributes revenue less than the sale of electricity in terms of percentage. Industrial high tension consumers and non domestic consumers contribute higher revenue than the use sale of electricity consumed.

India is agricultural dominated country; therefore a low tariff rate is charge in comparison with the industrial consumers (High and Low Tension). The research has also found that the agricultural and domestic consumers are proportionately high in comparison with the defaulters set of consumers. In case of agricultural consumers, the utilities operating in Gujarat are having a higher tariff, higher revenues and higher collection efficiency in comparison with the utilities operating in Odisha.

Conclusion

The study focused on the analysis of consumption pattern and contribution to revenue of power sector in India. The study found that industrial consumers use a majority of electricity followed by domestic and agricultural consumers. Further, the industrial consumers contribute 36% of the total revenue whereas agricultural and domestic consumers are the least contributors of revenue to total revenue. There is gap between the sale of electricity and the contribution of revenue in the utilities operating in India. It suggests that the utilities to improve the collection of revenue from the respective utilities. Further, the utilities should create awareness at rural areas to implicit agricultural consumers for making contribution to revenue. Therefore, the utilities

should increase the tariff of agricultural consumers and follow utilities which are successful in terms of revenue earnings.

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Annexure -A

Break Up of Sale in Mkwh (%) to Total Sales											
	Domestic	Non Domestic	Agricultural	Industrial HT	Industrial LT	Public Lighting	Public Water Works	Bulk Supply	Railway	Inter State	Others
2007	23.46	7.62	24.11	28.52	6.96	1.38	1.84	1.88	2.07	1.91	0.24
2008	23.29	7.64	23.45	28.72	7.14	1.34	1.86	2.03	2.04	2.17	0.32
2009	23.66	7.35	22.87	27.77	7.65	1.38	1.91	1.73	1.96	2.95	0.77
2010	24.1	8.47	23.4	26.05	7.83	1.38	1.98	1.7	1.91	2.25	0.93
2011	23.81	8.16	21.77	27.26	7.01	1.2	2.19	1.5	1.96	3.97	1.17
2012	24.2	8.6	23.11	27.13	5.3	1.28	1.87	2.19	1.9	3.32	1.1
2013	25.6	8.74	22.22	24.14	6.44	1.22	2.16	1.26	1.94	3.89	2.37
2014	26.09	8.9	21.68	22.51	6.66	1.42	2.27	2.5	1.81	4.56	1.59
2015	26.42	8.5	22.6	23.88	5.8	1.31	1.85	2.4	1.46	3.69	2.08
mean	24.51	8.22	22.8	26.22	6.75	1.32	1.99	1.91	1.89	3.19	1.17

Annexure-B

Break up of Revenue in Rs. Crores (%) to Total Revenue											
	Domestic	Non Domestic	Agricultural	Industrial HT	Industrial LT	Public Lighting	Public Water Works	Bulk Supply	Railway	Inter State	Others
2007	18.75	12.94	6.16	39.98	9.7	1.47	2.18	2.53	3.06	2.91	0.32
2008	18.23	13.35	6.03	38.83	9.76	1.28	2.03	2.58	2.87	4.11	0.94
2009	18.42	13.62	6.13	36.38	10.21	1.25	2.07	2.27	2.72	5.56	1.38
2010	19.53	14.64	6.4	35.95	10.06	1.33	2.37	2.47	2.73	2.99	1.52
2011	19.9	13.41	7.27	35.52	9.62	1.11	2.37	2.49	2.68	3.59	2.04
2012	19.78	14.06	7.47	37.27	7.48	1.17	2.2	2.5	2.47	2.78	2.82
2013	20.64	14.59	7.37	32.96	8.42	1.32	2.43	1.2	2.69	2.92	5.47
2014	21.14	14.58	8.06	32.65	8.41	1.53	2.44	2.52	2.5	3.28	2.9
2015	21.73	13.97	8.92	33.71	7.76	1.38	2.28	2.83	2.08	2.31	3.03
Average	19.79	13.91	7.09	35.92	9.05	1.32	2.26	2.38	2.64	3.38	2.27

Annexure- C

Gap between Sale and Revenue (In terms of %)			
Consumer wise	Sale in MKwh (%) to Total Sale	Revenue in Crore (%) to Total Revenue	Difference
Domestic	24.51	19.79	-4.72
Non Domestic	8.22	13.91	5.69
Agricultural	22.80	7.09	-15.71
Industrial HT	26.22	35.92	9.70
Industrial LT	6.75	9.05	2.29
Public Lighting	1.323	1.316	-0.008
Public Water Works	1.99	2.26	0.27
Bulk Supply	1.91	2.38	0.47
Railway	1.89	2.64	0.75
Inter State	3.19	3.38	0.19
Others	1.17	2.27	1.09