STUDY ON DETERMINTION OF ELECTRICITY DISTRIBUTION COST OF DHAKA PBS-3

submitted in partial fulfillment of the requirements for the Award of Degree of Bachelor of Science in Electrical and Electronic Engineering

By

Biplab Chandra Paul
(ID: 162-33-3386)
And

Md. Arman Hossain
(ID: 162-33-3334)

Supervised by

Professor Dr. M. Shamsul Alam
Dean
Faculty of Engineering

Co-supervised By

Md. Israfil Raju
Research Associate
Department of EEE

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING
FACULTY OF ENGINEERING

DAFFODIL INTERNATIONAL UNIVERSITY

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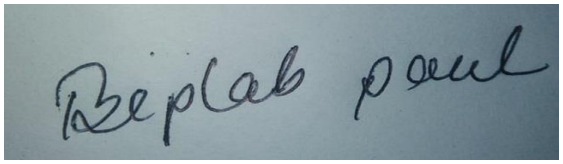
Certification

This is to certify that this thesis entitled "**Study on Determination of Electricity**

Distribution Cost of Dhaka PBS-3" is done by the following student under my direct supervision and this work has been carried out by him in the laboratories of the Department of Electrical and Electronic Engineering under the Faculty of Engineering of Daffodil International University in partial fulfillment of the requirements for the degree of Bachelor of Science in Electrical and Electronic Engineering. The presentation of the work was held on.

Signature of the candidate



Biplab Chandra Paul
ID: 162-33-3386

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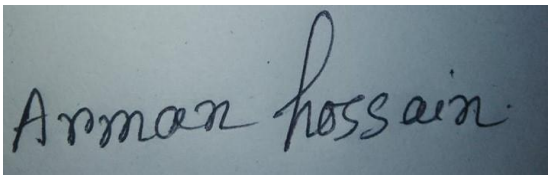
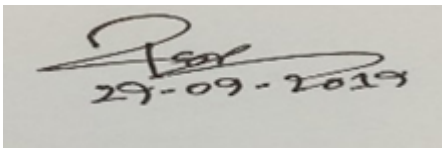


Md. Arman Hossain
ID: 162-33-3334

Countersigned



Dr. M. Shamsul Alam
Professor and Dean
Department of Electrical and Electronic Engineering
Faculty of Engineering
Daffodil International University

DECLARATION

The thesis entitled "**Study on Determination of Electricity Distribution Cost DPBS-3"** submitted by **Biplab Chandra Paul**, ID: 162-33-3386 and **Md. Arman Hossain**, ID: 162-33-3334 and Session: Summer 2016 has been accepted as satisfactory in partial fulfillment of the requirements for the degree of **Bachelor of Science in Electrical and Electronic Engineering**.

Dedicated to

Our Parents

&

Teachers

CONTENTS

LIST OF TABLES

List of Figure

List of Abbreviations

AGE	Administration & General Expenses
BERC	Bangladesh Electricity Regulatory Commission
BPDB	Bangladesh Power Development Board
BREB	Bangladesh Rural Electrification Board
CSE	Consumer Selling Expenses
DAE	Depreciation & Amortization Expenses
DC	Distribution Cost
DESCO	Dhaka Electricity Supply Company
EC	Energy Cost
EV	Electrified Village
GDP	Gross Domestic Product
GOB	Government of Bangladesh
EH	Electrified Houses
HP	Horse Power
IE	Import Energy
IE	Interest Expenses
IPPs	Independent Power Producers
KV	Kilovolt
KWh	Kilo Watt Hour (Unit)
MU	Million Units (Million KWh)
MW	Mega Watt
NEV	Non Electrified Village
OME	Operation & Maintenance Expenses
PBS	Palli Bidyut Samity

PDB	Power Development Board
PF	Power Factor
PGCB	Power Grid Company of Bangladesh
REP	Rural Electrification Program
SL	System Loss
TSC	Total Supply Cost
TX	Tax Expenses
Tk	Taka (TK)
TR	Total Revenue
WC	Wheeling Charge

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ABSTRACT

This thesis is on “Study on Determination of Electricity Distribution cost of Dhaka PBS”

Electricity distributions convey information on internal system operation to the actors involved. Electricity pricing is, then, of major importance both in liberalized and regulated systems. Most electricity consumers interact with the industry only through the price they pay for these service. Consequently, good tariff design reflects industry regulation as a whole and is the instrument used to provide consumers with the right signals. Day by day the challenge becomes really to harder to meet up power crisis, especially to meet up power crisis in rural area. So government formed Rural Electrification Board (REB) from Bangladesh Power Development Board (BPDB) to fulfill the power demand for village people. Tariff rate of electrical power depends on transmission and distribution cost. This thesis study on electricity import of Dhaka PBS consumer levels and their unit consumption in different season and cost associated electricity supply. This Paper also finds the total Distribution cost, Distribution cost per unit, supply cost, supply cost per unit, total revenue, total revenue per unit, energy purchase cost, system loss, surplus etc. This paper will also be helpful to get knowledge a stable electricity distribution structure to meet the future electricity crisis of Bangladesh. Electricity distribution cost is important issue in our country. Because electricity tariff rate and distribution cost are related with our economic growth. Although distribution costs are usually the largest part of the access tariff (or use of system charge), there is not a universally accepted methodology for distribution pricing. The earliest attempts at cost allocation conformed what is now known as the accounting approach, based on business accounting. In recent years, the proposals have focused on two approaches: the application of long-term marginal (or incremental) cost and the cost-causality principle. Although the former aims to achieve a better economic signal, because of the difficulties surrounding its implementation, the most usual solution applied in practice draws more heavily from the causality princip

CHAPTER 1
INTRODUCTION

1.1 Introduction

In Bangladesh, age of rural electrification is enough mature ready to face any challenges. This is a story of how a cost-effective electric energy supply has been developing lifestyle in about 90 percent areas of Bangladesh. After the liberation was, it's a journey from darkness to the light of the impact between desire and hope. The Bangladesh government is planning to generate 24,000MW by 2021, 40,000MW by 2030, and 60,000MW electricity by 2041. Dhaka already celebrated the success of producing 20,000MW power by lighting fireworks. Our study is on how electricity supply is cost- effective and with less of losses, which can be more safe and affordable to the rustic. There are many factors which may have been profit towards such change. Our study is a decent attempt to find any missing linkage in energy supply that could help develop the supply.

Scenario of Electricity sector in Bangladesh

The utility electricity sector in Bangladesh has total installed capacity is 21,419 MW (combining solar power). Bangladesh's energy sector is booming. Recently Bangladesh started construction of the 2.4-gigawatt (GW) Rooppur Nuclear Power Plant expected to go into operation in 2023. According to the Bangladesh Power Development Board in July 2018, 90 percent of the population had access to electricity. However per capita energy consumption in Bangladesh is 464 KW as considered low.

Electricity is the major source of power for most of the country's economic activities. Bangladesh's total installed electricity generation capacity (including captive power) was 21,419 MW as of May 2019 where Maximum generation was 12,494 MW as of 11 May, 2019.

The largest energy consumers in Bangladesh are industries and the residential sector, followed by the commercial and agricultural sectors.

As of 2015, 92% of the urban population and 67% of the rural population had access to electricity. An average of 77.9% of the population had access to electricity in Bangladesh. Bangladesh will need an estimated 34,000 MW of power by 2030 to sustain its economic growth of over 7 percent. Whereas targeted goal an estimated 24,000 MW of power by 2021 and 40,000 MW of power by 2030, 60,000

MW of power by 2041 receptively.

Problems in Bangladesh's electric power sector include high system losses, delays in completion of new plants, low plant efficiency, erratic power supply, electricity theft, blackouts, and shortages of funds for power plant maintenance. Overall, the country's generation plants have been unable to meet system demand over the past decade.

1.2 BREB

After the independence of Bangladesh in 1971, the first major implantation to expand grid electricity in rural areas was taken in 1975 under a scheme called 'Total Electrification Program'. This program looked beyond grid connectivity towards the development of the basic distribution facilities for useful delivery of power to rural areas by 1978. At around the time, constructing institutional structure was considered, which would develop the technical, economic, financial and social analysis, and organizational requirements for a rural electrification project in Bangladesh. Then at the request of the Bangladesh Government Rural Electrification Project Committee, a decision was taken for the foundation of a new national agency under the Power Ministry to develop and administer a rural electrification program. Accordingly, Rural Electrification Board (REB) was established on 29 October 1977 and started functioning on 1 January 1978 with following basic objectives:

- Ensure consumer participation in policy-making.
- Provide reliable, sustainable and affordable electricity to rural people.
- Help improve the economic condition of rural people by providing electricity for Agriculture and small industries.
- Help improve the living condition of rural people.
- Expand electrification to entire rural Bangladesh.

The Rural Electrification Board of Bangladesh has been providing service to rural member consumers for over 39 years. Continued support from the Government of Bangladesh, the donor community, consulting partners, and member consumers will help this program continue to extend, providing the gift of electricity to millions more Bangladeshi households, businesses, and industries.

Mission Statement: Provide quality electricity at grass root level in a democratic manner.

Vision Statement: Electricity for all by 2021.

Table 1.1: Bangladesh Rural Electrification Board at a Glance

Website	www.reb.gov.bd
No of Board member	12
No of Approved Projects	83
Number of PBSs operating commercially	80
No PBSs electrified	80
Number of district Included in RE program	61
No of Upazillas Included in RE program	460
No of villagers energized	68,049
Distribution line constructed(Km)	3,19,708 Km
Total distribution line energized	3,03,464 Km
Number of 33/11 KV Sub-Station Constructed	(867 Constructed by BREB)
Average system Loss	11%
Installed Capacity of Sub-stations	10,075 MVA

1.2.1 Future plans

Due importance has been given on energy conservation and energy efficiency and a target has been set to conserve 15% energy by 2021 and 20% by 2030. The present government is committed to turn Bangladesh into a middle-income country by 2021, and by 2041 aiming to transforming it into a developed country. For that, Bangladesh needs to generate 24,000 MW, 40,000 MW, and 60,000 MW by 2021, 2030 and 2041 respectively. The Power Division is working relentlessly to implement the power generation plan accordingly, and committed to implement the pledge "Sheikh Hasina'r Uddyog, Ghore Ghore Biddyut".

SL. No.	Year	Generation Plan
1	2021	24,000 MW
2	2030	40,000 MW
3	2041	60,000 MW

Accordingly, rural electrification has been aimed as one of the principal components of the overall rural infrastructures for development of national economy. Without improving electricity coverage in the rural areas, Bangladesh would not have been able to realize the targeted annual GDP growth rate.

1.3 Palli Bidyut Samity (PBS)

The REB program operates through locally organized rural electric associations called Palli Bidyut Samity (PBS). The concept of PBS is based on the model of Rural Electric Cooperatives in the USA,

which operates with cooperatives and ownership of consumers. REB doesn't generate any electricity. They purchase electricity from the national grid or from selected IPPs at the 33KV voltage level. They are responsible for providing electricity to their 78 PBSs members and customer. **Palli Bidyut Samity** is the Bengali name of a Rural Electric Society. It is a consumer owned entity organized on the basic principles of Co-operative for distribution of electric power to its members and other consumers. It is an independent corporate body subject to all applicable laws and prescribed Bye-Laws and is responsible for the efficient and effective management of its affairs including proper and successful construction, operation and maintenance of its electric distribution facilities as well as to take measures for effective use of electricity to foster rural development with special emphasis on increase of use of electric power for economic pursuits, such as development of agriculture and establishment of rural industries and assisting the disadvantaged sections of the community for augmenting their income and standard of living.

As per Bye-Laws, the PBS shall at all times be operated on No Loss-No Profit basis for the mutual benefit of all its Members and non-members alike and is expected to repay all indebtedness on schedule. As per REB ordinance-1977 (LI of 1977) the Rural Electrification Board is the registering authority of a PBS. There are 82 PBSs under the BREB in Bangladesh.

FUNCTIONS OF PBS

- Consumer connection
- Sub-station & line maintenance.
- Consumer complains handling.
- Decide on line extension.
- Motivate people.
- Purchase & sale of electricity.
- Tariff setting in consultation with BREB.

1.3.1 Dhaka Palli Bidyut Samity-3

Since its inception in 1996, Dhaka Palli Bidyut Samity-3 is playing a vital role in Agricultural,

Industrial and Socio-Economic Development of Dhaka District. The Rural Electrification Program conducted by Dhaka Palli Bidyut Samity-3 has acted a leap forward in the development of socio-economic structure of rural areas in Dhaka District as well as entire Bangladesh. It has a significant and sustained impact on agricultural growth, industrialization and business & commercial activities in the rural areas. It is a consumer-owned entity organized on the basic principles of Cooperative for

distribution of electric power to its members and operates on No Loss - No Profit basis for the mutual benefits of its entire Member.

Table 1.3: DPBS-3 at a Glance

WEBSITE	**www.Dhakapbs3.org.bd**
DATE OF REGISTRATION	**01-01-2014**
DATE OF ENERGIZATION	**01-01-2014**
AREA	**455 Sq. Km**
NO. OF UPAZILA	**05**
NO. OF UNION	**27**
NO. OF ZONAL OFFICE	**05**
NO. OF AREA OFFICE	**07**
NO. OF COMPLAIN CENTRE	**12**
NO. OF CONTROL ROOM	**01**
NO. OF VILLAGE	**589**
NO. OF VILLAGE ELECTRIFIED	**589**
VILLAGE ELECTRIFIED	**589**
LINE CONSTRUCTION REQUIRED FOR TOTAL ELECTRIFICATION	**3194.37 km.**
TOTAL LINE CONSTRUCTED	**3194.37 km.**
TOTAL CONSUMER CONNECTED	**357927**
CATEGORY WISE CONNECTIONS	
DOMESTIC **COMMERCIAL** **CHARITABLE INSTITUTION** **IRRIGATION** **INDUSTRY**	**312448** **33401** **2627** **694**

STREET LIGHT	**261**
NO. OF CONSUMERS PER Km.	**112**
% REVENUE PER (TK.) FY 16-17 **IMPROVEMENT OF POWER FACTOR**	
NO. OF SUB-STATION (33/11 KV) Active	
MAXIMUM DEMAND	**185**
AVERAGE REVENUE (PER UNIT)	**TK. 4.66***
AVERAGE COST (PER UNIT)	**Tk. 6.60***
OPERATING MARGIN (Jul,15 to Jun 16)	**- (TK. 23,597,809)**
NET MARGIN (Jul,15 to Jun, 16)	**-(TK. 28,011,324)**
% SYSTEM LOSS (2018-19)	**8.44%**
COLLECTION **THIS MONTH (JUN, 16)** **YEAR TO DATE(Up to JUN,16)**	

1.3.2 Objective

The scope of this study is the analysis of the costs that are associated with the power transfer as well as the realization of new methods and tools concerning the calculation and the allocation of these costs. The power distribution costs, which are charged to the market participants, are a central issue of the new cosmos of electricity markets. The increased requirement for fair and transparent pricing in the competitive environment as well as the complexity introduced by unbundling the services point out why this issue is of great importance. In general, the cost associated with the distributed power may be categorized as follows:

- Cost associated with the power losses.
- Cost caused by system congestion.
- Fixed cost of the power system.
- Universal access to quality electricity in a cost-effective and affordable manner.

- Provide quality and reliable electricity to the people of the country for desired economic, social and human development.
- To deliver quality electricity with service excellence.
- To make electricity available on demand within the geographical area of REB.
- The main objective of our study is a modest attempt to find any missing/ leakage in energy supply that could be more developed the supply for rural electrification board.

1.3.3 Methodology

We were aware during the course of our study and following discussions with representatives of the power division of the Department of Rural Electrification that there were no established techniques or methodology in this field of socio-economic research. Indeed, in view of the uniqueness of the areas studied and the scarcity of suitable data, it is doubtful if any but a most general methodology could be established. Accordingly, we describe in greater detail than might be normal, the concepts, definitions, and difficulties encountered in our approach to the study in the expectations that such descriptions will be of use in future studies. We highlight a number of reform options and recommendations for industry and household energy use policies. Losses are important as there is an environmental and economic cost associated with them.

In this research, a methodology or a model based on System dynamic approach has been developing to make more energy available at affordable prices to enable all people to use modern energy to meet their basic needs. To slow the overall growth of energy consumption through conservation and energy efficiency improvement and to make energy sources more environmentally sustainable.

Today BREB have 78 operating rural electric cooperatives called Palli Bidyut Samity (PBS).For research, I choose the Dhaka PBS-3.I collected some primary data from Dhaka PBS-3, BREB and BERC.

1.4 Outline of the Thesis

The outline of the thesis is as follows:

- Chapter 1: Introduction, BREB, PBS, DPBS-3 then the objective of the thesis, outline of the thesis.
- Chapter 2: Literature view.
- Chapter 3: Introduction, Broad and Specific, Impact on Education, Impact on Gender Dimensions, Impact on Irrigation and Agricultural Production, Impact on Mass Media,

Summary.

- Chapter 4: Introduction, Important Terms Energy Import Analysis, Data
- Analysis, Substation of DPBS-3, System loss
- Chapter 5: Introduction, Description of consumer class, Domestic
- Consumers, Commercial Consumers, Charitable institute, Irrigation, General power, large power, In case of 33KV, Street Lights, Description of table and its analysis.
- Chapter 7: Electricity Cost, Electricity Purchase Cost, Bulk rate, Wheeling
- Charge, Distribution Cost, Operation & maintenance expenses (OME),
- Consumer selling expenses (CSE), Administration and General Expenses
- (AGE), Depreciation & amortization expenses (DAE), Tax expenses (TE),
- Interest expenses (IE), System Loss (Tk), Total Revenue (TR), Revenue from
- Sales Energy, Revenue from others, Other operating revenue, Non-operating
- Margins- interest, Total supply cost (TC),Surplus, Per Unit Cost Calculation,
- Distribution Cost (Tk/Unit), Revenue (Tk/Unit), System Loss Tk/Unit (SL), Tariff Rate, Bill Explanation.
- Chapter 8: Conclusions, Limitations of the Work, Future Outline.
- Chapter 9: Appendix

CHAPTER 2
LITERATURE REVIEWS

2.1 Literature review

Social development, industrial progress, economies and human life style are heavily depend on energy in 21st century. Energy are traded globally and the effects of energy use have worldwide consequences. Due to population increase and industrial development in future huge energy will be needed. Bangladesh, as a developing country needs an efficient energy system to minimize the losses and maximum utilization of generated power. Rural energy system is a very exoteric affair to researchers and planners. This paper provides an acknowledgment to assist in understanding the different factors affecting energy distribution, energy consumption, energy losses and energy cost.

S. Cole and D. Van Hertem state that recent technical and political developments require investments in the transmission grid. Up to recently, the only solutions for grid reinforcement were transmission lines and underground cables. Today much more technologies are or become available. The rising environmental concerns and the difficulties of obtaining right-of-way show that an assessment of these technologies on a mere techno-economical basis is no longer sufficient. This paper investigates overhead lines, new conductor types, underground cables, conventional ones as well as gas insulated and superconducting, FACTS and HVDC on a technical, economic, political, social and environmental basis [6].

The goal of research of Ferguson, J.P. was to determine how to configure a power distribution systems to obtain 99.999% power reliability. The location selected for analysis was Vandenberg Remote Tracking Station, California. The Research objectives were to design a generic power distribution system capable of providing 99.999% power reliability, determine the theoretical reliability of the existing system, determine the actual historical reliability, and identify and price any modifications required to achieve 99.999% power reliability. Site provided one-line electrical drawings and outage reports were used to develop mathematical models of the existing system based on standards published by the Institute of Electrical and Electronics Engineers. The generic model was a fully redundant radial power distribution system [5].

M. T. Carrillo Cobo and their team denoted that irrigation networks usually constrained by the high amounts of energy required for their operation. In this sector, farmers are organized in turns, is one of

the most efficient measures to reduce their energy consumption. Irrigation system is designed according to the distance to the pumping station and their elevation [9].

Tooraj Jamasb, Luis Orea and Michael Pollitt narrated that estimating marginal costs of quality can help energy regulators to design more effective incentive mechanisms for distribution network utilities to achieve optimal quality levels and reduce welfare losses .They implement this methodology to the case of the UK electricity distribution networks. They, find that the incentives to encourage utilities to reduce network energy losses have led to performance improvement [7].

Maximum asset performance is one of the major goals for electric power system managers. To reach this goal minimal life cycle cost and maintenance optimization become crucial while meeting demands from customers and regulators. One of the fundamental objectives is therefore to relate maintenance and reliability in an efficiently and effectively way, which is the aim of several maintenance methods such as the Reliability Centered Maintenance method (RCM). Furthermore, this necessitates the determination of the optimal balance between preventive and corrective maintenance to obtain the lowest total cost.

The computations of the indices are performed both with analytical and simulation based techniques. Furthermore, the indices can be used to calculate the component contribution to the total system interruption cost. The approach developed for the importance indices can be utilized in any multi-state network that can be measured with one performance indicator [8].

We highlight a number of reform options and recommendations for industry and household energy use policies. Losses are important as there is an environmental and economic cost associated with them.

Thomas F.Sanquist, Heather Orr, Bin Shui and AlvahC.Bittner indicated that Residential Energy Consumption Survey (RECS) identified five lifestyle factors reflecting social and behavioural patterns associated with air-conditioning, laundryusage, personal computer usage, climate zone of residence, and TV use. Multiple regression analysis using the lifestyle factors yields solutions accounting for approximately 40% of the variance in electricity consumption for both years. By adding the household and market characteristics of income, local electricity price variance accounted for is increased to approximately 50% [9].

Douglas F.Barnes, ShahidurR.Khandker and Hussain A.Samad pointed that Energy poverty is a well-established concept among energy and development specialists. They uses a demand-based approach to define the energy poverty line as the threshold point at which energy consumption begins to rise with increases in household income. The findings suggest that some 58 percent of rural households in Bangladesh are energy poor, versus 45 percent that are income poor. The findings also suggest that

policies to support rural electrification and greater use of improved biomass stoves might play a significant role in reducing energy poverty [13].

Md. Alam Hossain Mondal, Wulf Boie and Manfred Denichnoted that data on the future electricity demand is an essential requirement for planning the expansion of a power system. In the low to high GDP growth scenarios, the extent of industrial restructuring and technical advancement is gradually increased. The study also compares the projected per capita electricity consumption in Bangladesh with the historical growth in several other developing countries. Such an evaluation can create awareness among the planners of power system expansion in Bangladesh to meet the high future demand [12].

To date, power system analysis has been performed separately for transmission and distribution systems. Due to the small influence of distribution systems on transmission systems, separate analyses have had no accuracy problems in existing power systems. However, as the amount of distributed generation (DG) in distribution systems increases, neighboring distribution systems and even transmission systems can be affected by the distributed generation. Therefore, a power system operator needs a new system to analyze the power system, one that considers the mutual interactions between the transmission and distribution systems. This paper presents with applications and case studies a transmission and distribution integrated monitoring and analysis system for high DG penetration. The integrated system analyzes the mutual interaction between the transmission and distribution systems due to DG. The preliminary evaluation of the DG connections is automated in this system, using real time online data. Case studies with practical data show the need and effectiveness of transmission and distribution integrated monitoring and analysis for real power systems with high DG penetration [11].

This paper presents most of the focus on households demand, but the few studies analyzing commercial, industrial demand and irrigation demand are also reviewed.

CHAPTER-3

ENERGY IMPORT OF DHAKA PBS-3

3.1 Introduction

Need of electricity is increasing day by day. The lack of power is one of the major problems in Bangladesh. For economic freedom and in order to meet the consumer demands, the electricity growth that is produce more electricity, building more transmission and distribution capacity, bringing more area population under electricity coverage and ensuring more effective and efficient management, of these are the essential issues. The Government of Bangladesh (GOB) has decided to build power plants in private sectors so that Independent Power Producers (IPPs) launched their business in Bangladesh. In this chapter brief the history of the DPBS-3 and their energy import scenarios are discussed.

3.2 Important Terms Energy Import Analysis

Grid:

In electrical system, a grid is a network of synchronized power providers and consumers that are connected by transmission and distribution lines and operated by one or more control centers.

Substation:

A substation is a part of an electrical generation, transmission, and distribution system. Substations transform voltage from high to low, or the reverse, or perform any of several other important functions.

Kilowatt-Hour (KWh):

Kilowatt-Hour means measure of electricity define as a unit of worker energy, measured as 1 Kilowatt (1,000watts) of power expended for1 hour.

Peak Demand:

The peak demand of an installation or a system is simply the highest demand that has occurred over a specified time period. Peak demand is typically characterized as annual, daily or seasonal and has the unit of power. Peak demand, Peak load or On-peak are terms used in energy demand management

describing a period in which electrical power is expected to be provided for a sustained period at a significantly higher than average supply level.

System Loss:

Power generated in power stations pass through large and complex networks like transformers, overhead lines, cables and other equipment and reaches the end users. It is fact that the unit of electric energy generated by Power Station does not match with the units distributed to the consumers. Some percentage of the units is lost in the distribution network. This difference in the generated and distributed units is known as Transmission and
Distribution loss. Transmission and Distribution loss are the amounts that are not paid for by users.

System Loss (%) = [(Energy Input to feeder (Kwh) – Billed Energy to Consumer (Kwh))

÷ Energy Input (KWh)] * 100.

Load Factor:

Load Factor means the ratio of the average load to peak load served by a plant or power system during a specified time interval. A higher load factor indicates the higher use of the generating resources.

$$\textbf{Load Factor} = \frac{\textbf{Total Unit KWh(Purchase)}}{\textbf{Total Peak Demand} \times 1000 \times 24 \times 30} \times 10$$

3.3 Energy Import DPBS-3

Dhaka PBS-3 import electricity from both government and private sector to meet their consumer demand, DPBS-3 import electricity from six public sectors (2015-2018) i.e.; Savar (Dhaka), Kollyanpur (Dhaka), Manikgonj (Dhaka), Aminbazar super (Dhaka) and Dhaka PBS-1 (Dhaka) and Dhamrai Grid to provide electricity to the different level of consumers. In this chapter we discuss about Energy Purchase and purchase cost from Public sector. For two years (2015-2017), also explain about different Grid and Substations, Supply, System Losses, KWh Sold to the consumers. We are explain few month date and all date table are in Appendix.

Import point	July'15			December'15		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit KWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	49,022,400			33,823,680		
Kalyanpur	7,768,260			5,469,300		
Manikgang	4,007,430			5,620,569		
Amin Bazar Super	30,960	**53,887,610**	**19.41**	28,530	**46,132,475**	**7.95**
Dhaka PBS-1	6,037,520			5,172,478		
Dhamrai Grid	0			0		
Total	**66,866,570**			**50,114,557**		

Table 4.1:-Energy Import DPBS-3 (2015-2016)

In July 2015 calculated total purchased KWh is 66,866,570 unit where Savar purchased 49,022,400 Unit, Kallyanpur purchased 77,68260 Unit, Manikgonj purchased 4,007,430
Unit, Amin bazar super purchased 30,960 Unit, Dhaka PBS-1 purchased 60,37,520 Unit, Dhamrai grid purchased 0 Unit.
Total Sold KWh is 5,38,87,610 Unit. Total System Loss is 19.41 %.

In December 2015 calculated total purchased KWh is 50,114,557 unit where, Savar purchased 33,823,680 Unit, Kollyanpur purchased 5,469,300 Unit, Manikgang purchased 5,620,569 Unit, Amin bazar super purchased 28,530 Unit, Dhaka pbs-1 purchased 5,172,478 Unit, Dhamrai purchased 0 Unit. Total Sold KWh is 46,132,475 Unit. Total System Loss is 7.95 %.

All of the month energy import analysis showed in the Tables. The demand of the electricity varies with different season in Bangladesh, like as winter, summer, and rainy season. We try to show relevant analysis for winter and summer seasons, which is high import from previous month and system loss is also comparatively high and it's an effect of summer season because in summer the energy consumption of different consumers is high. On the other hand, the energy import for the month of November, December, January and February are low to compare as other months of the year. It is seasonal effect of winter, when the domestic consumer consume lower amount of electricity and same as some industries are consume lower amount of energy as per demand of production. The energy import demand is high for the month of March, April, May and June.

3.4 Graphical Analysis

From the graphical representation of above figure, the energy import is comparatively high in March, April, May, and June every year. On the other hand, energy import is comparatively low in November, December, January and February. Season to season the energy import and supply to the consumer may

vary. According to graph, behavior of energy import of DPBS-3 is approximately same. In January, 2015 energy import is 1.41 MU and energy import in June is

2.81 MU and where 1.40 MU difference from January to June.

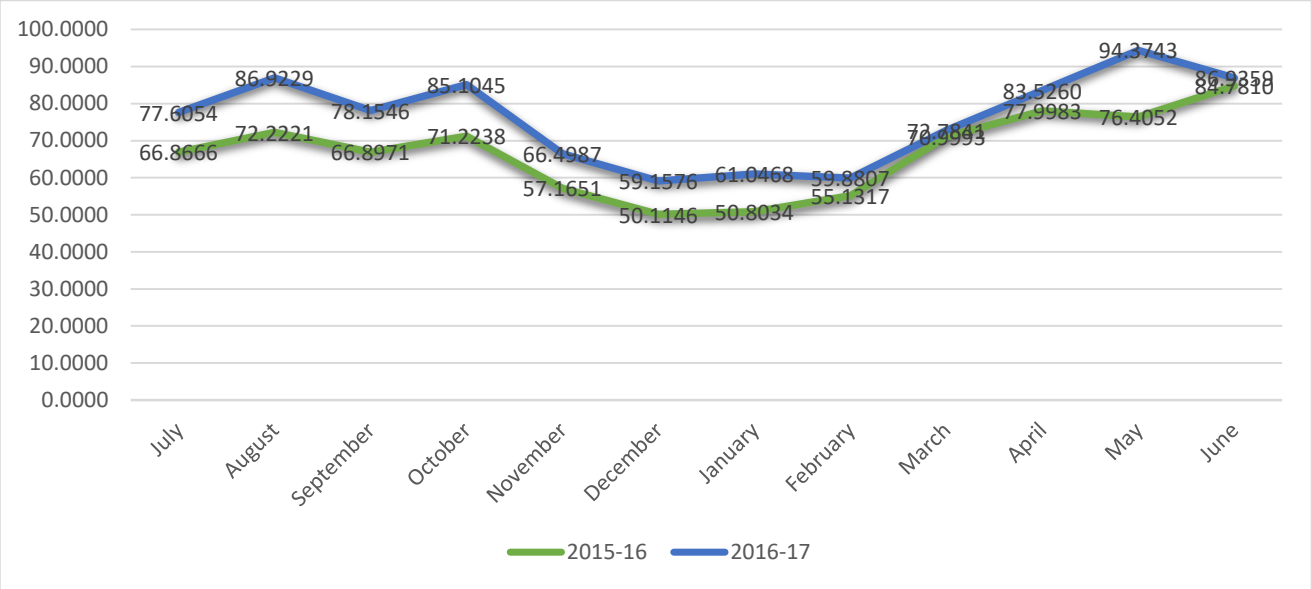

Fig 3.1: Monthly Import Energy (MU) of DPBS-3, 2015-17

It is possible to control load demand by proper load management, encouraging Independent Power Producers (IPP) and reducing transmission loss. Initiative should be taken to develop skilled manpower required for the power sector considering incorporating IPPs and local Government (GOV), central GOV may take the responsibility to increase the power generation and ensure its proper use in Bangladesh

3.5 Substation of DPBS-3

There are 6 substations under DPBS-3 which are connected with different grids. The energy storage and consumption different form one substation to another substation based on the location, consumer demand, industrial zone, transmission distance and many factors. The imported energy may reduce during the transmission process due to system loss. DPBS-3 all substation names listed below and the 33 KV consumers are indicated with star sign.

List: Sub-stations of DPBS-3

Savar
Kollyanpur
Manikgang
Dhaka PBS-1
Amin Bazar Super
Dhamrai

3.6 System Losses

Month	Grid wise import (MU)	Substation Wise Import (MU)	KWh sold at Consumer end (MU)	Grid system loss (MU)	Sub-station system loss (MU)	Grid to 33 KV line loss (MU)
July	66.87	65.82	53.89	12.98	11.93	1.05
August	72.22	70.81	65.26	6.96	5.55	1.41
September	66.9	64.45	62.32	4.58	2.13	2.45
October	71.22	68.3	66.17	5.05	2.13	2.92
November	57.16	56.38	55.34	1.82	1.04	0.78
December	50.11	49.81	46.13	3.98	3.68	0.3
January	50.8	50.59	48.75	2.05	1.84	0.21
February	55.13	54.95	52.32	2.81	2.63	0.18
March	71	70.35	64.2	6.8	6.15	0.65
April	78	77.36	70.54	7.46	6.82	0.64
May	76.41	75.84	68.94	7.47	6.9	0.57
June	84.78	84.01	74.79	9.99	9.22	0.77

Table 3.2: System Loss of DPBS-3 in (2015-16)

Month	Grid wise import (MU)	Substation Wise Import (MU)	KWh sold at Consumer end (MU)	Grid system loss (MU)	Sub-station system loss (MU)	Grid to 33 KV line loss (MU)
July	77.61	77.22	71.57	6.04	5.65	0.39
August	86.92	86.24	79.18	7.74	7.06	0.68
September	78.16	77.62	71.77	6.39	5.85	0.54
October	85.1	84.28	77.29	7.81	6.99	0.82
November	66.5	65.84	64.45	2.05	1.39	0.66
December	59.16	58.76	55.02	4.14	3.74	0.4
January	61.05	60.79	57.52	3.53	3.27	0.26
February	59.88	59.34	58.79	1.09	0.55	0.54
March	72.78	72.4	68.71	4.07	3.69	0.38
April	83.53	79.34	78.35	5.18	0.99	4.19
May	94.37	93.92	86.13	8.24	7.79	0.45
June	86.94	86.41	76.88	10.06	9.53	0.53

Table 3.3: System Loss of DPBS-3 in (2016-17)

In Table 3.2: Grid system loss= Grid wise import energy to KWh sold energy at Consumer end

Sub-station system loss= Substation Wise Import energy to KWh sold energy at Consumer end Grid to Sub - station loss= Grid wise import energy to Substation Wise Import energy

As we found from the table, Total loss of energy in summer is much higher than winter. Heat increases the line resistance and resistance makes the amount of loss higher. 33 KV Line losses are quite similar but sub-station system losses differ hugely. Where form October, 2015 to January, 2016; during the winter season, system losses were below than 2 MU. In July, 2015 and June, 2016; both of these in summer, we found the total system loss about 3 times higher than winter. PBS says illegal use of electricity is also responsible. Illegal use of electricity rise in summer very badly. That's why; the loss is very much in summer. PBS try to stop the illegal use of electricity but public awareness can stop this "Thief Loss". PBS also has some loss for storms during summer and Rainy season.

3.7 Graphical Representation

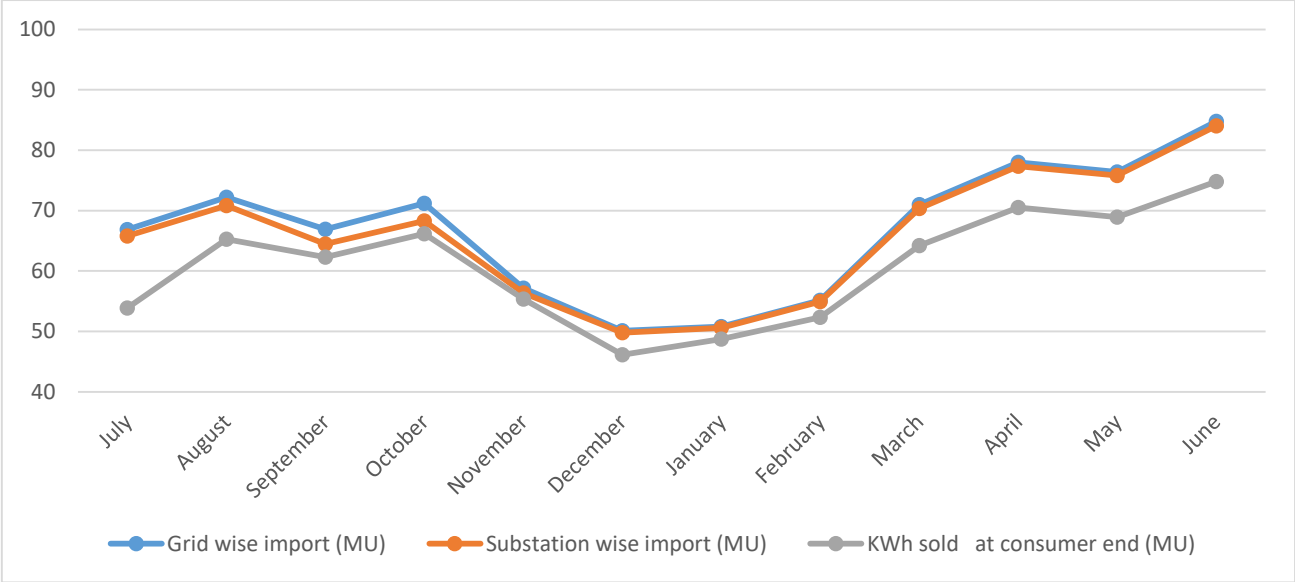

Fig 3.2: Grid and Sub-station wise import with Unit sold at consumer end 2015-16.

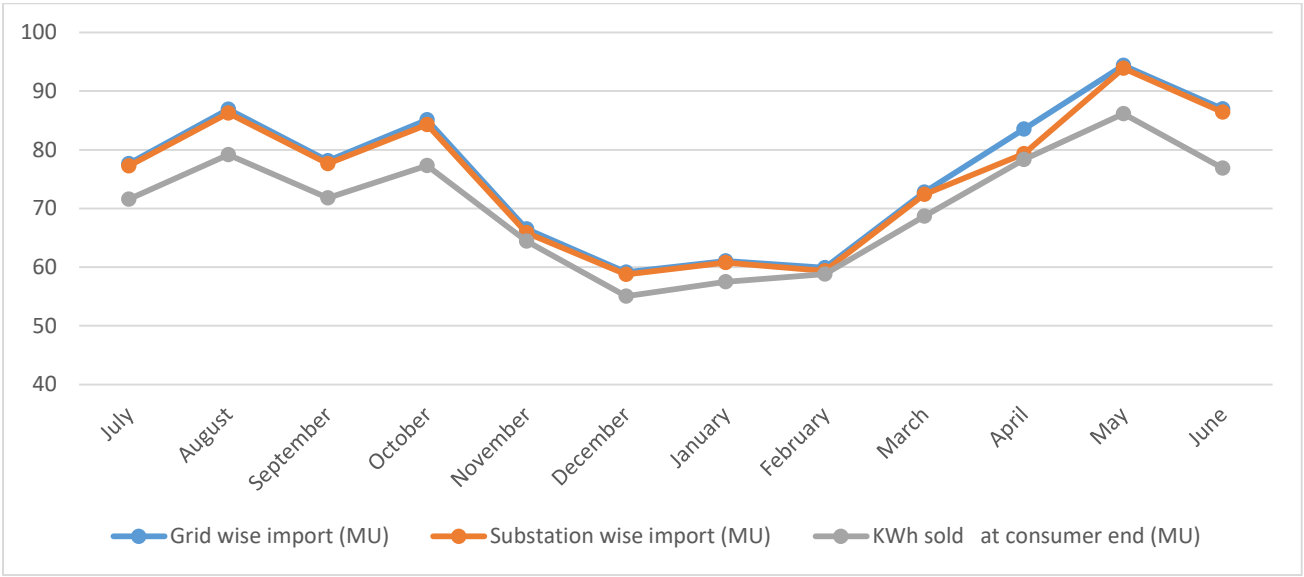

Fig 3.3: Grid and Sub-station wise import with Unit sold at consumer end 2016-17.

3.8 Load Factor

Load factor is defined as the ratio of the average load over a given period of time to the maximum demand (peak load) occurring in that period. In other words, the load factor is the ratio of energy consumed in a given period of the times in hours to the peak load which has occurred during that particular period.

A load factor is simply the energy load on a system compared to its maximum potential or peak load for a period of time.

Load Factor: 2015-16

Month	Load Factor
July	69.88
August	76.97
September	68.54
October	79.05
November	78.35
December	75.67
January	66.03
February	61.84
March	76.65
April	69.71
May	67.98
June	74.50

Load Factor: 2016-17

Month	Load Factor
July	70.66
August	77.78
September	68.73
October	75.89
November	59.71
December	56.70
January	52.63
February	51.37
March	58.56
April	51.37
May	73.98
June	68.78

Graphical Analysis:

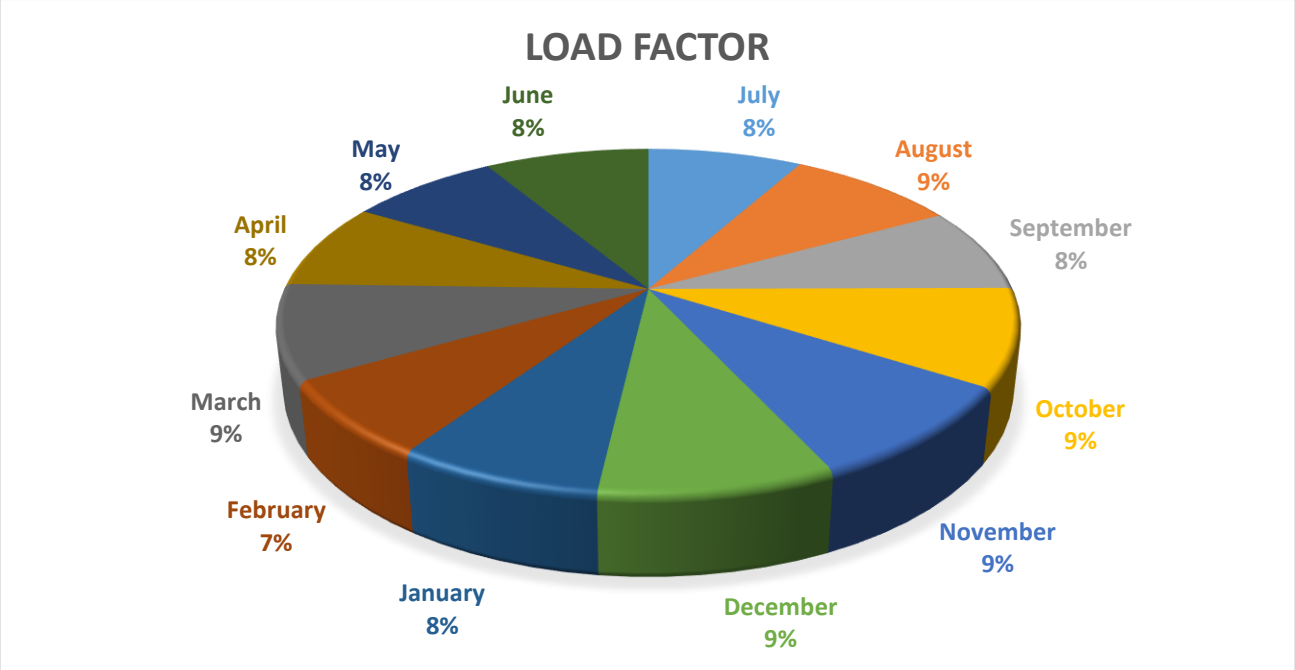

Fig 3.5.: Load factor of DPBS-3 in (2015-2016)

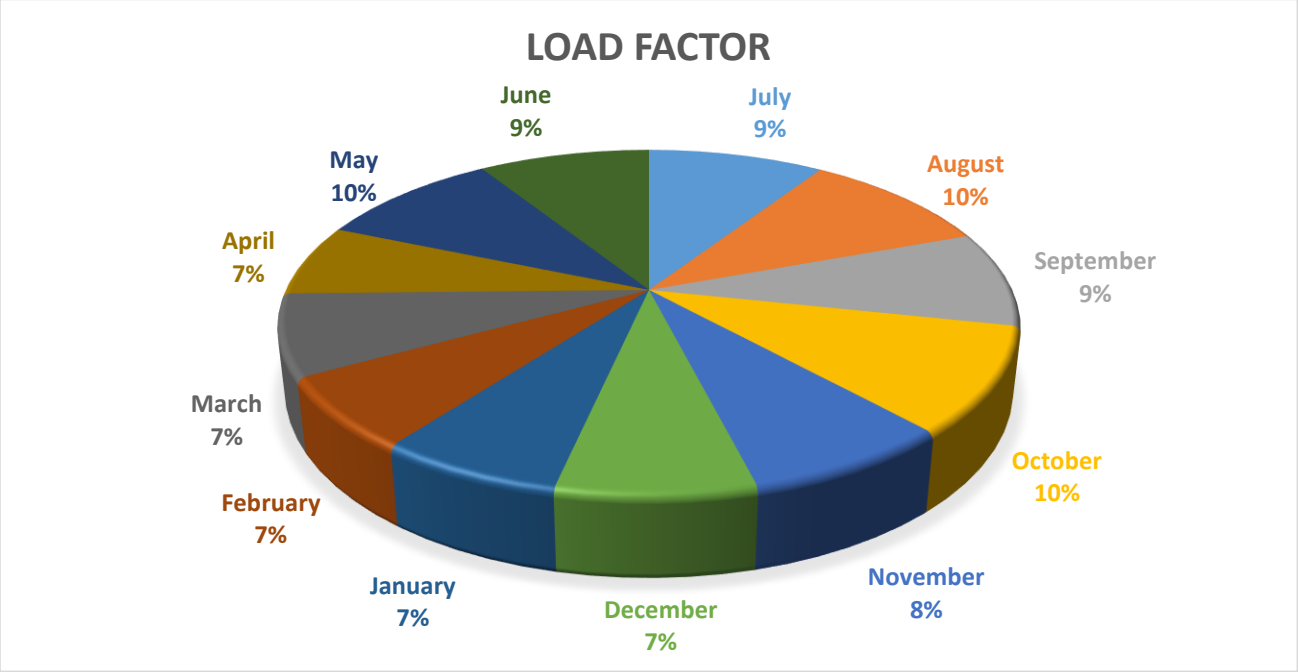

Fig 3.6: Load factor of DPBS-3 in 2016-2017

Here, DPBS-3 maintain a constant range of load factor of 7 to 9% from 2015 to 2017 in average. But some month has higher percentage value than the average. As figure shown, June 2016 and October 2017 have higher percentage only. DPBS-3 need to maintain this percentage. It is highly recommended that, load factor should be high and assure proper distribution of electricity.

3.9 Summary

It is possible to control load demand by proper load management, encouraging Independent Power Producers (IPP) and reducing transmission loss. The Initiative should be taken to develop skilled manpower required for the power sector considering incorporating IPP and local Government (GOV), central GOV, private sector may take the responsibility to increase the power generation and ensure its proper use in Bangladesh. The process of energy import and distribution of DPBS-3is better from other PBS.

CHAPTER 4

CONSUMERSAND REVENUE OF DHAKA PBS-3

4.1 Introduction

The power industry is one of the key industries in each country because today the production of all goods and the consumption of many are impossible without electric power. Utilizing many services like lighting, conditioning, freezing and many other services depends on electricity.

4.2 Description of Consumer Class

There are eight types of consumer in every PBS under BREB based on their demand and category of energy use. Those classes are bellows,

4.2.1. Domestic Consumers

Domestic consumers are those who consumed electrical energy in their resident through household equipment. These consumers are classified based on an amount of their consumed unit (kWh) energy. These consumers use single phase line. Domestic consumers are classified into eight slabs. These are

- Minimum KWh
- 0-50 KWh
- 0-75 KWh
- 76-200 KWh
- 201-300 KWh
- 301-400 KWh
- 401-600 KWh
- Above 600 KWh

4.2.2. Commercial Consumers

Commercial consumers are actually related to business or commercial activities. Commercial consumers have higher electric demand than Domestic consumers. But they use single phase line as Domestic consumers.

Types of consumer under this category will be as follows,

Hat- bazaar, Shop (including tailoring shop) Commercial Enterprise, Government and Semi Government Office, Private Clinic, Practicing chamber, Community Center or Hall, Rest House, Cinema Hall, Mobile Tower, Petrol/CNG Pump Station.

4.2.3. Charitable Institute

Charitable institutes are depend on the charity of the Government or any private sector.

Charitable institutes may any educational, religious or social development institutions.

Types of consumer under this category will be as follows,

Mashed, Temple, Church, Pagoda, School, College, Madrasah, Club, Orphanage, Charitable institution (Not complex), Charitable dispensary, Crippled rehabilitation center etc.

4.2.4 Irrigation

Basically, all kinds of water pumps are used to irrigate in agriculture fields in this class. They may be single or three phase in connection.

4.2.5 General power

Generally Palli Bidyut Samity will implement secondary metering (L.T. metering) for such types of consumer where supply voltage will be 230/400 V and power will be 50KW. All consumers like industries and industrial complex, Government office complex, Government and charitable hospital complex, Charitable, religious and education complex,

Small Industries related to production or fabrication, Union Paribar Kalian Kendra, Cantonment, air or naval base/installation, Police station, Camp, Outpost etc. and BDR Camp, BOP Installation etc.

4.2.6 Large power

Generally Palli Bidyut Samity will implement primary metering (H.T metering) connection for such type of the consumer where Supply voltage will be 6350/11000 voltage. And power may be the same as general power but in these case connections will three phases.

All types of industries and industrial complex, Government office complex, Government and charitable hospital complex, Charitable, religious and education complex, Small Industries related to production or fabrication, Union Paribar Kalian Kendra, Cantonment, air or naval base/installation etc. Police station, Camp, Outpost etc. and BDR Camp, BOP Installation etc.

4.2.7 33KV

33KV consumers are mostly industries. They have an individual sub-station for consuming energy. DPBS-3 have no consumer in category.

4.2.8 Street Lights

Consumed electric power by street lights is in this category. Street light is a raised source of light on the edge of a road in the rural area. These helps to develop the transport facilities of a village.

4.3 Description of Table and its Analysis

The making of revenue sheet, we use Electricity rate, used electricity in KWh, Consumer class, and revenue in monthly and finally we calculate it in yearly. In analysis part, we want to show that rate changing of electricity, Number of consumers and its increment or decrement in monthly, used electricity in KWh and its monthly status and revenue increment or decrement in monthly.

From this analysis we will see that the present condition of the revenue of BRE

Table 4.1: Monthly Revenue Data of DPBS-3, (2015-16)

Customer Class	July'15					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	134530	0.28	8931	4.64	803,790	0.27
0-50	5994398	12.28	22304	11.60	20,803,402	7.03
0-75	10255297	21.00	20301	10.56	40,801,434	13.79
76-200	4792207	9.81	90497	47.05	25,847,602	8.74
201-300	4332342	8.87	30156	15.68	23,188,790	7.84
301-400	2738012	5.61	11713	6.09	15,161,200	5.12
401-600	1483141	3.04	6716	3.49	12,789,460	4.32
600++	880820	1.80	1713	0.89	8,790,733	2.97
Total	**30610747**	**62.69**	**192331**	**100%**	**148,186,411**	**50.09**
Commercial	4649117	9.52	17801		45,762,714	15.47
Charitable	445102	0.91	1783		2,288,515	0.77
Irrigation	331579	0.68	5603		1,349,087	0.46
General Power	1023579	2.10	2134		7,053,726	2.38
Large Power	10809637	22.14	440		84,103,279	28.43
33 KV	933625	1.91	3		6,908,650	2.34
Street Light	28106	0.06	57		199,383	0.07
Grand Total	**48,831,492**	**100%**	**220,152**		**295,851,765**	**100%**

If we look at july-2015-16, Domestic consumer consumed total 30610747units, Number of total consumer 192331 and total revenue 148186411TK where minimum slab was 134530 units, Number of consumer 8931 and revenue 803790 In 0-50 was 5994398 units, Number of consumer 22304 and revenue 20803402TK.

In 0-75 was 10255297 units, Number of consumer 20301. And revenue 40801434. In 76-200 was 4792207 units, Number of consumer 90497 and revenue 25847602 TK. In 201-300 was 4332342 units, Number of consumer 30156 and revenue 23188790TK. In 301-400 was 2738012 units, Number of consumer 11713, and revenue 15161200. In 401-600 was 1483141 units, Number of consumer11713, and revenue 12789460TK and above 600 was 880820 units, Number of consumer 1713 and revenue 8790733TK.

In Commercial consumer consumed total 4649117 units, Number of consumer 17801 and revenue 45762714TK. In Charitable institute consumer consumed total 445102 units, Number of consumer 1783 and revenue 2288515TK. In Irrigation, consumer consumed total 331579 units, Number of consumer 5603 and revenue 1349087TK. In General power, consumer consumed total 1023579 units, Number of consumer 2134 and revenue 7053726 TK. In Large power, consumer consumed total 10809637units, Number of consumer 440 and revenue 84103279 TK. In 33KVconsumer consumed total 933625 units,

Number of consumer 3 and revenue 6908650 TK. In street light, totally consumed energy is 28106 units, Number of consumer 57 and revenue 199383TK.

4.4 Graphical Analysis (Domestic)

In these process we calculate all the month of the year of 2015-2017

Here we divided every year in three season for our capitalize which are,

- Summer season(March-June)
- Rainy season (July-October)
- Winter season(November-February)

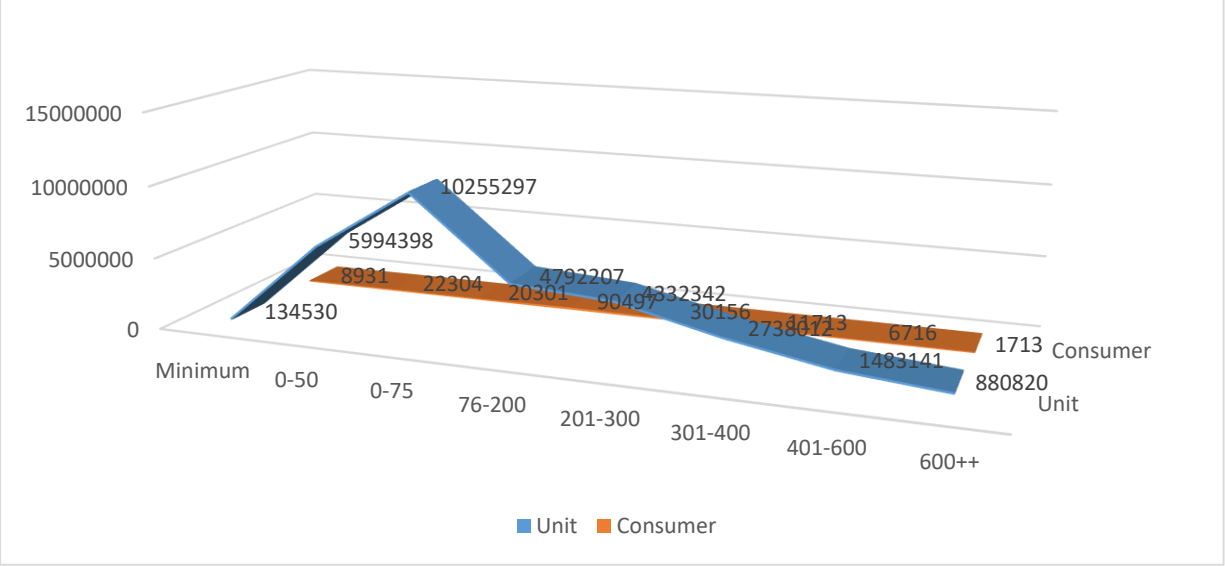

Fig 4.2: Unit Consumption and Consumer (Domestic) in July, 2015

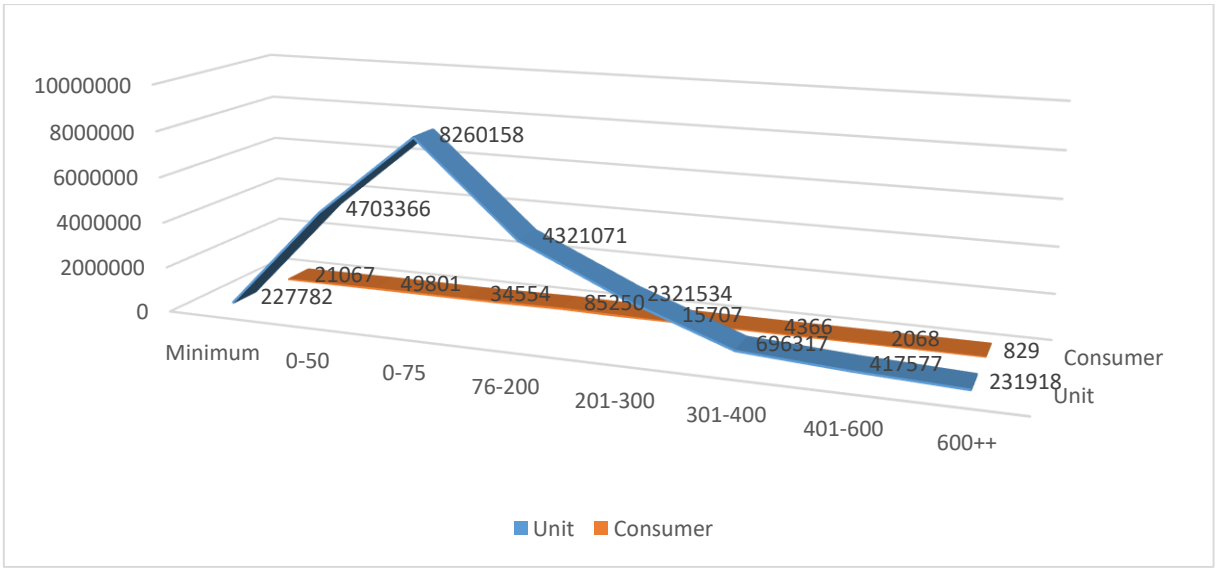

Fig 4.2: Unit Consumption and Consumer (Domestic) in December, 2015

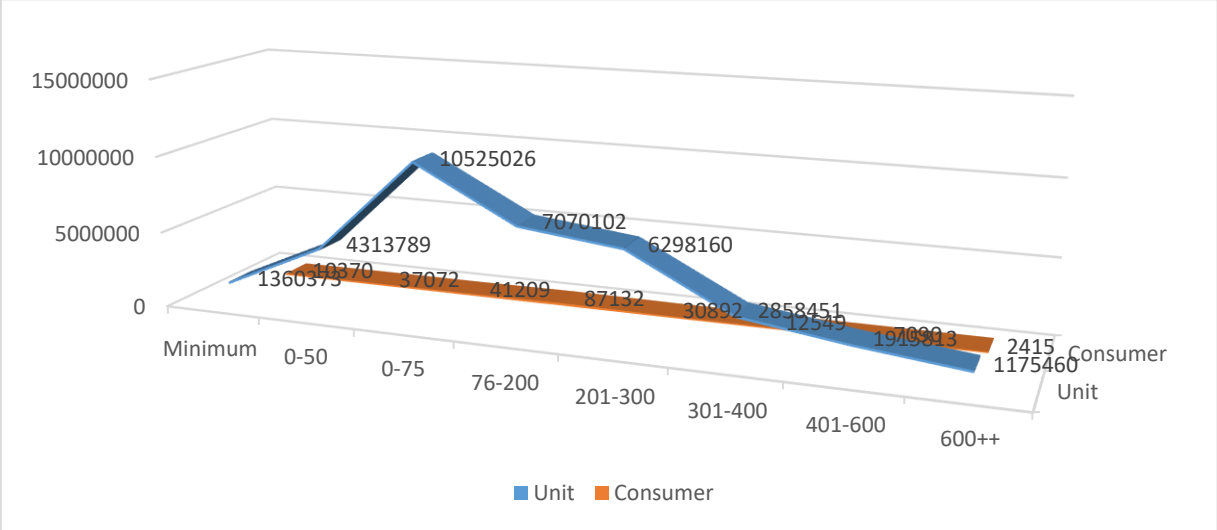

Fig 4.3: Unit Consumption and Consumer (Domestic) in May, 2016

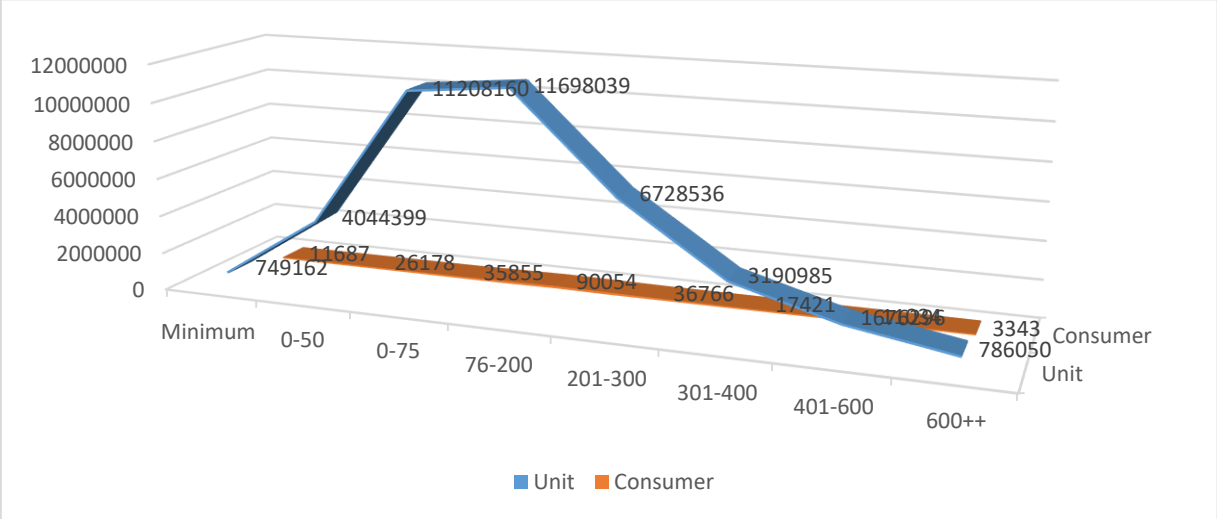

Fig 4.2: Unit Consumption and Consumer (Domestic) in July, 2015

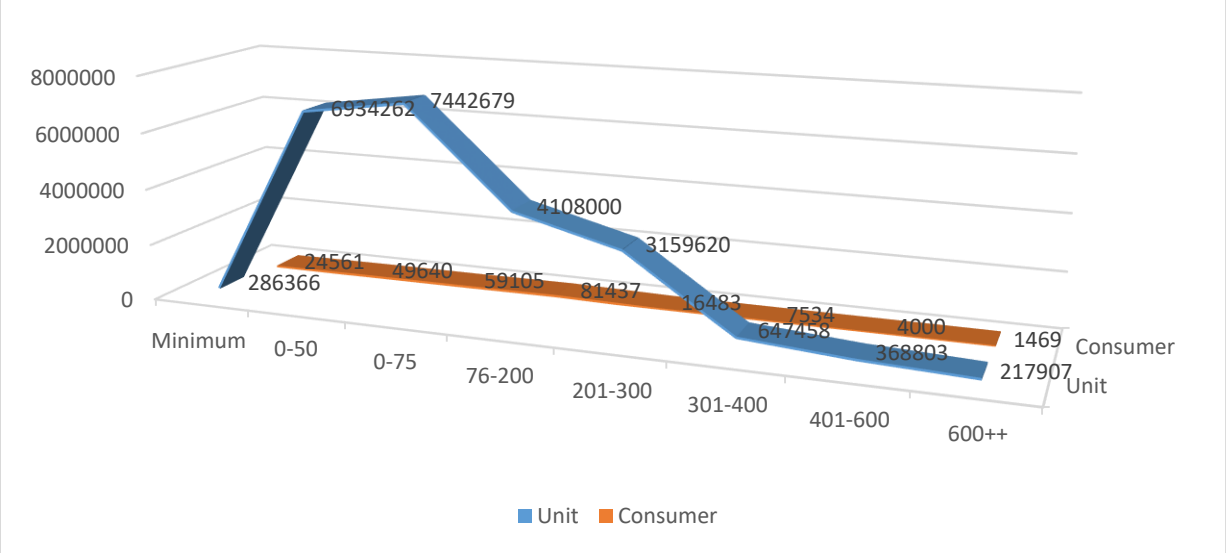

Fig 4.5: Unit Consumption and Consumer (Domestic) in December, 2016

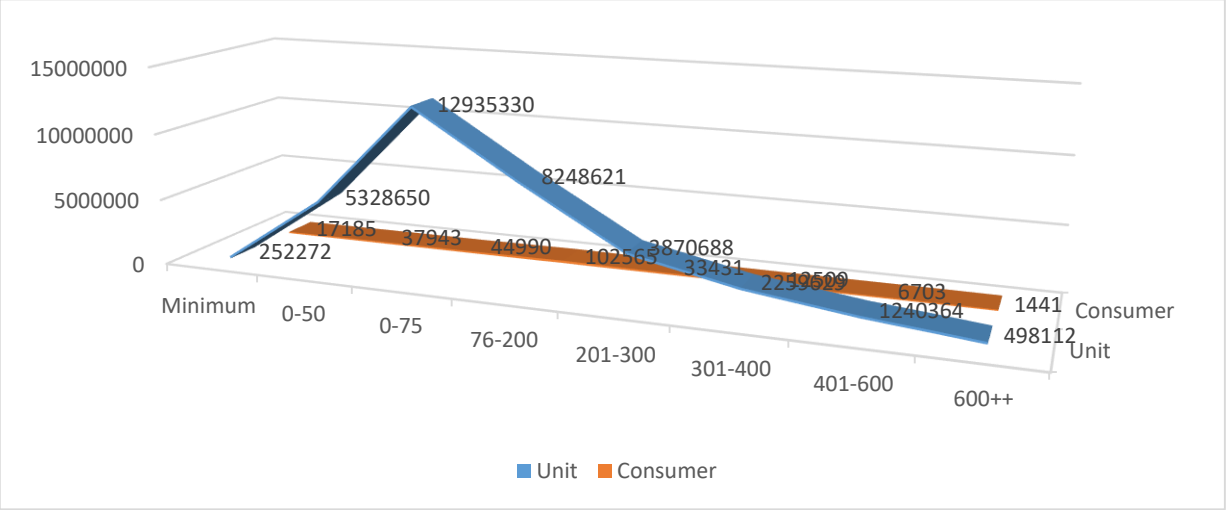

Fig 4.6: Unit Consumption and Consumer (Domestic) in May, 2017

In July 2015, the number of the consumer is 9.22% for 1-75KWh and the number of units is 21% for 1-75 KWh is highest percentage of the graph, 1-50 KWh the number of consumers is 10.13%and the number of units is 12.28%, 76-200 KWh the number of consumers is 41.11% and the number of units is 9.81%, the minimum consumer is 4.06% the minimum unit is 0.28% and 301- 400 KWh the consumer is 5.32 % and the unit is 5.61% and 600++ consumer 0.78% and unit is about to 1.80 %. In summer season number of consumer increase in 76-200 KWh slab due to more use of the electrical appliance.

In December 2015, the number of the consumer is 14.19 % and the number of units is 19.62% for 1-75 KWh which is the highest percentage of the consumer of the graph, 1-50 KWh consumer is 20.45% and the unit is 11.17%, the minimum consumer is 8.65% and the unit is 0.54% and

600++ consumer 0.34% and unit about to 0.55%. In winter season number of consumer increase in 175 slab due to less use of electrical appliance like AC, fan, refrigerator etc.

In May 2016, the number of the consumer is 15.90 % and the number of units is 16.97% for 1-75 KWh which is the highest percentage of the consumer of the graph, 1-50 KWh consumer is 14.31 %and the unit is 6.96%, the minimum consumer is 4.00% and unit is 2.19% and 600++ consumer 0.93% and unit is about 1.90 %.

4.5 Comparison of Total, Domestic, Lifeline and Minimum Consumer

In the above table analysis shown that the comparison between a Total slab of the consumer to the Domestic slab and we know Total slab of consumer consist of the Domestic slab, Commercial slab:

4.2: Compare Domestic with Total Domestic and Lifeline (0-50), Minimum and 1-75 (2015)

Month(15-16)	Total			Domestic					
	Unit	Revenue	Consumer	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consume
July	48831492	295851765	220152	30610747	62.69	148186411	50.09	192331	87.36
August	60147171	373625596	226121	35617934	59.22	177160955	47.42	196691	86.98
Septembe	56675073	352515126	231427	35080724	61.9	173523200	49.22	202035	87.30
October	59266605	380919232	243648	34099336	57.54	171662006	45.07	214620	88.09
Novembe	50340155	319900852	244000	29978634	59.55	147772571	46.19	211943	86.86
Decembe	42096513	272926320	243485	21179723	50.31	99292314	36.38	213642	87.74
January	45026102	297066127	248095	19027460	42.26	88271304	29.71	219185	88.35
February	48823272	316083411	251979	19264050	39.46	89569258	28.34	222305	88.22
March	58131037	376895571	251641	25196790	43.34	119465247	31.70	221207	87.91
April	63543895	406835705	255162	31419416	49.45	152940588	37.59	225235	88.27
May	62023336	394475180	259095	35517174	57.26	175588975	44.51	228729	88.28
June	662416450	4223905880	2893187	352533857	53.22	1718371228	40.68	2556590	88.37

Month(15-16)	Domestic						Lifeline					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consume	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consume
July	30610747	62.69	148186411	50.09	192331	87.36	5994398	12.28	20803402	7.03	22304	10.13
August	35617934	59.22	177160955	47.42	196691	86.98	7647194	12.71	26387167	7.06	23229	10.27
Septembe	35080724	61.9	173523200	49.22	202035	87.30	4850547	8.56	17204553	4.88	21058	9.10
October	34099336	57.54	171662006	45.07	214620	88.09	4787720	8.08	16915514	4.44	22951	9.42
Novembe	29978634	59.55	147772571	46.19	211943	86.86	4153674	8.25	15019060	4.69	32449	13.30
Decembe	21179723	50.31	99292314	36.38	213642	87.74	4703366	11.17	17392525	6.37	49801	20.45
January	19027460	42.26	88271304	29.71	219185	88.35	5428113	12.06	20065725	6.75	54778	22.08
February	19264050	39.46	89569258	28.34	222305	88.22	5280678	10.82	19820823	6.27	56765	22.53
March	25196790	43.34	119465247	31.70	221207	87.91	4543064	7.82	6375790	4.34	43194	17.16
April	31419416	49.45	152940588	37.59	225235	88.27	4925117	7.75	17661923	4.34	38219	14.98
May	35517174	57.26	175588975	44.51	228729	88.28	4313789	6.96	15421131	3.91	37072	14.31
June	3.53E+08	53.22	1718371228	40.68	2556590	88.37	64965192	9.81	23500880	5.55	225990	7.81

Month(15-16)	Slab 1-75 compare with domestic					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	10255297	21.00	40801434	13.79	20301	9.22
August	9375871	15.59	37268191	9.97	18059	7.99
September	9968254	17.59	39503408	11.21	18205	7.87
October	9283783	15.66	36040425	9.46	23279	9.55
November	9509365	18.89	37059102	11.58	23365	9.58
December	8260158	19.62	32693930	11.98	34554	14.19
January	7418161	16.48	29613612	9.97	41729	16.82
February	7477111	15.31	29769622	9.42	41073	16.30
March	9649049	16.60	37931446	10.06	36653	14.57
April	10207697	16.06	39991914	9.83	29359	11.51
May	10525026	16.97	41025324	10.40	41209	15.90
June	11378028	17.18	44170902	10.46	394452	13.63

First, we compare the number of Consumer, energy consumption and revenue with Total and Domestic according to Total. The percentage of energy consumption shown in Domestic, as usually low during the winter season. It's also clear that domestics consume above 50.31% of total energy in DPBS-3. Where Revenue shows 36.38% and Number of consumer above 87.74% in average of their total.

4.6 Graphical Representation

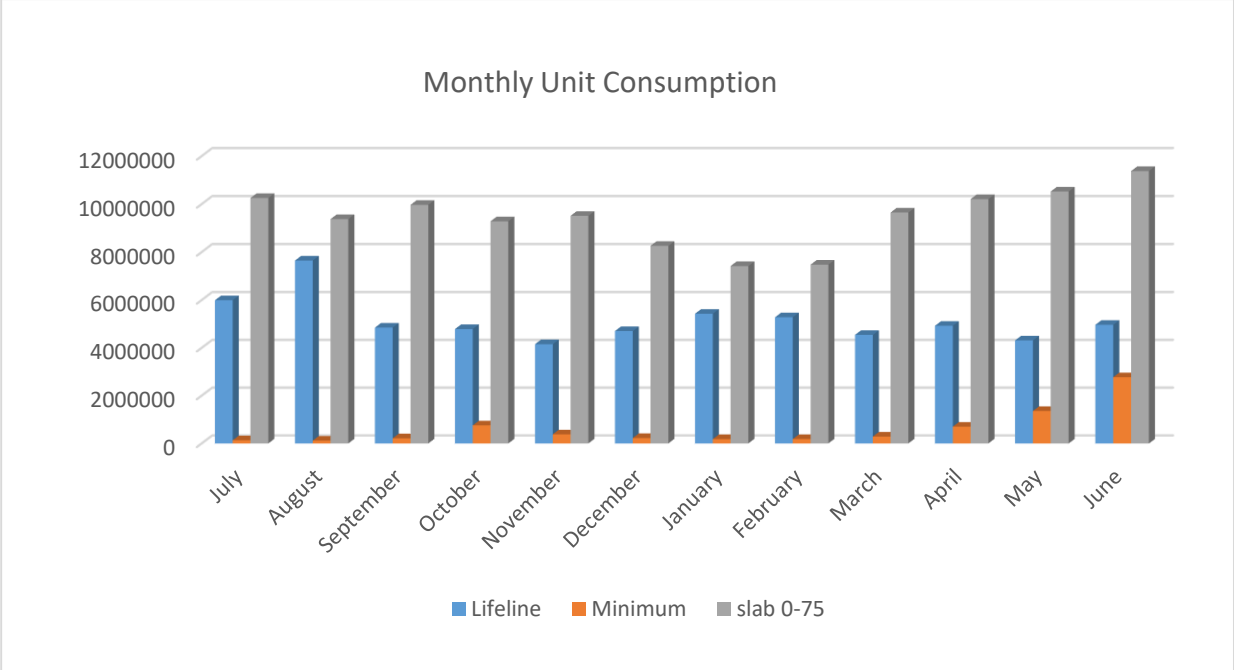

Fig 4.4: Monthly Unit Consumption of Lifeline, Minimum and 1-75 Slab

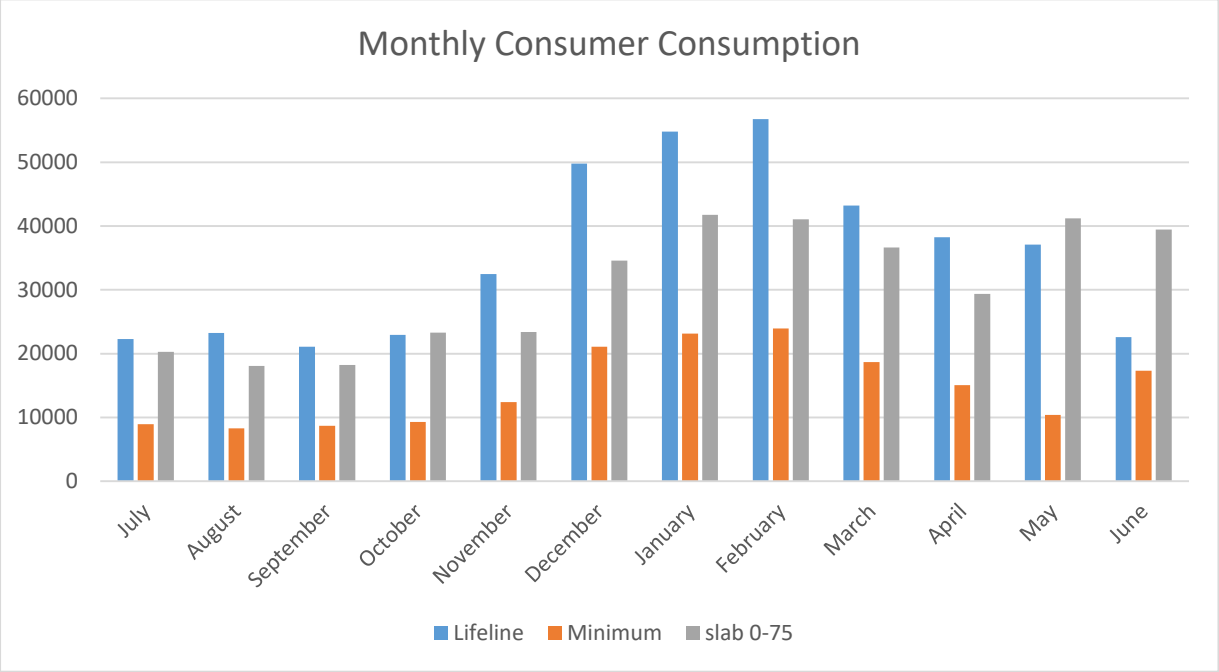

Fig 4.5: Monthly Consumer Consumption of Lifeline, Minimum and 1-75 Slab

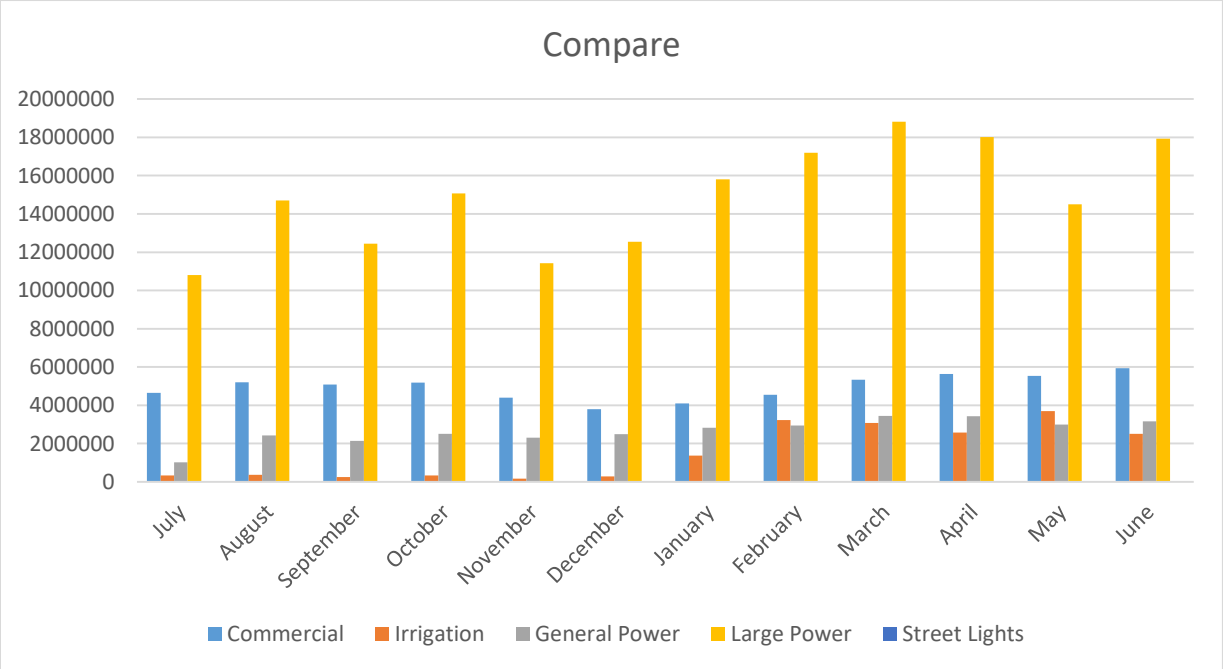

Fig 4.7 Monthly unit consumption of Commercial, Charitable, Irrigation, Large power DPBS-3

(2015-2016)

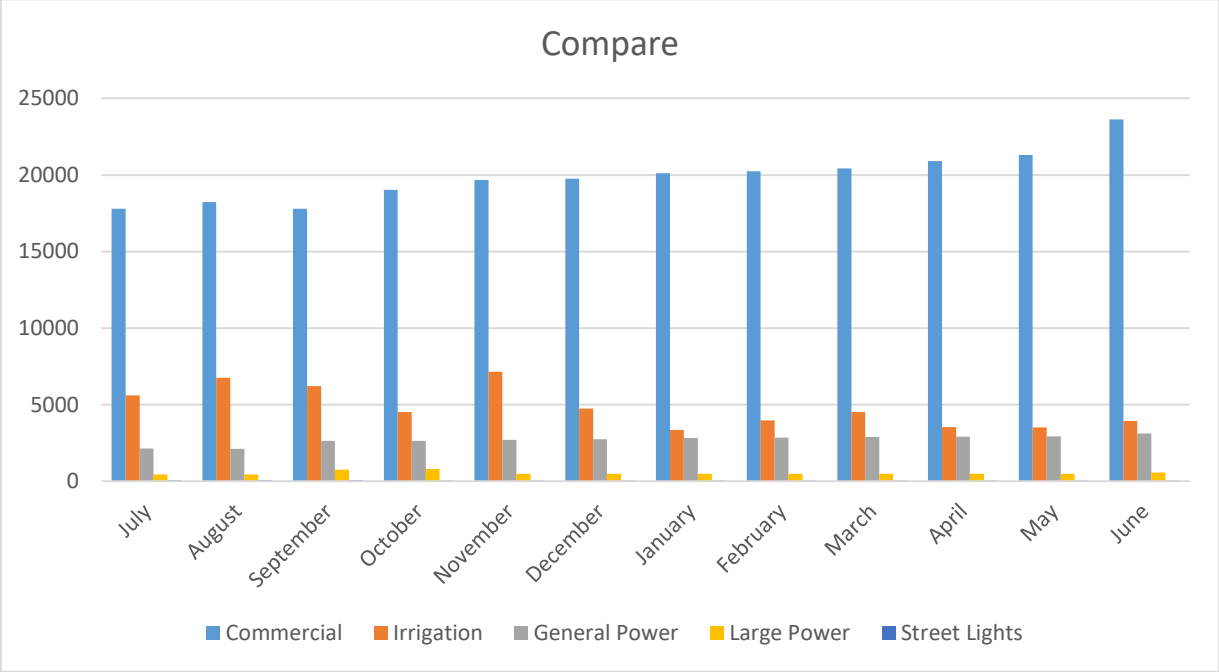

Fig 4.7 Monthly consumer consumption of Commercial, Charitable, Irrigation, Large power DPBS-3 (2015-2016)

Compare with Fig 4.4 and 4.5 Minimum consumer consume very little amount of energy but sometime their number was highest.

4.7 Comparison of Total, Commercial, Charitable Institution and Irrigation, General Power, Large Power, 33 KV, Street Light Consumer

First we compare between the number of consumer, energy consumption and revenue with Total and Commercial according to Total. The percentage of energy consumption show in

Commercial, are high during winter season. It's also clear that Commercial consume above

3.64% of total energy in DPBS-3.

Table 4.2: Compare Domestic with Total Domestic and Commercial (2015-2016)

Month(15-16)	Total			Commercial					
	Unit	Revenue	Consumer	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consume
July	48831492	295851765	220152	4649117	9.52	45762714	15.47	17801	8.09
August	60147171	373625596	226121	5203979	8.65	51153087	13.69	18243	8.07
September	56675073	352515126	231427	5082371	8.97	50057797	14.20	17788	7.69
October	59266605	380919232	243648	5184562	8.75	53265100	13.98	19036	7.81
November	50340155	319900852	244000	4405954	8.75	44579578	13.94	19674	8.06
December	42096513	272926320	243485	3801374	9.03	38699536	14.18	19750	8.11
January	45026102	297066127	248095	4093115	9.09	41699526	14.04	20108	8.10
February	48823272	316083411	251979	4552186	9.32	46062649	14.57	20247	8.04
March	58131037	376895571	251641	5339276	9.18	53713758	14.25	20439	8.12
April	63543895	406835705	255162	5630553	8.86	56560659	13.9	20907	8.19
May	62023336	394475180	259095	5532263	8.92	55612607	14.10	21306	8.22
June	662416450	4223905880	2893187	59370298	8.96	596405957	14.12	236342	8.17

Month(15-16)	Charitable Institution compare with Total						Irrigation compare with Total					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	445102	0.91	2288515	0.77	1783	0.81	331579	0.68	1349087	0.46	5603	2.55
August	511482	0.85	2617658	0.70	1813	0.80	361850	0.60	1486694	0.40	6757	2.99
Septembe	527270	0.93	2709731	0.77	1929	0.83	258793	0.46	1174322	0.33	6204	2.68
October	470101	0.79	2640528	0.69	1977	0.81	331321	0.56	1437354	0.38	4524	1.86
Novembe	416475	0.83	2251052	0.70	1978	0.81	170097	0.34	864387	0.27	7162	2.94
Decembe	250428	0.59	1393690	0.51	2051	0.84	281617	0.67	1254451	0.46	4753	1.95
January	237330	0.53	1330451	0.45	2070	0.83	1375723	3.06	5354491	1.80	3349	1.35
February	245706	0.50	1373008	0.43	2062	0.82	3231045	6.62	12562817	3.97	3970	1.58
March	375141	0.65	2042913	0.54	2054	0.82	3070674	5.28	11901595	3.16	4520	1.80
April	478721	0.75	2579452	0.63	2047	0.80	2577528	4.06	10020991	2.46	3534	1.39
May	525059	0.85	2823493	0.72	2071	0.80	370086	0.60	1897101	0.48	3518	1.36
June	4971746	0.75	26687208	0.63	23462	0.81	12510836	1.89	50005882	1.18	39349	1.36

Month(15-16)	General Power compare with Total						Large Power compare with Total					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	1023579	2.10	7053726	2.38	2134	0.97	10809637	22.14	84103279	28.43	440	0.20
August	2427289	4.04	19045994	5.10	2110	0.93	14697668	24.44	112415909	30.09	447	0.20
Septembe	2146424	3.79	17517884	4.97	2647	1.14	12438107	21.95	98794320	28.03	765	0.33
October	2514197	4.24	20357702	5.34	2643	1.08	15066042	25.42	119162272	31.28	790	0.32
Novembe	2309725	4.59	20430996	6.39	2701	1.11	11422849	22.69	91572313	28.63	485	0.20
Decembe	2501381	5.94	20410754	7.48	2745	1.13	12550964	29.81	100150951	36.70	486	0.20
January	2830158	6.29	22953843	7.73	2836	1.14	15800850	35.09	124796614	42.01	490	0.20
February	2950923	6.04	23862213	7.55	2848	1.13	17192238	35.21	132035320	41.77	490	0.19
March	3454755	5.94	27706446	7.35	2886	1.15	18820447	32.38	147754123	39.20	478	0.19
April	3435261	5.41	27585416	6.78	2907	1.14	18005640	28.34	141864239	34.87	475	0.19
May	3000195	4.84	24268110	6.15	2929	1.13	14505464	23.39	114640495	29.06	483	0.19
June	31615518	4.77	255620580	6.05	31161	1.08	179336589	27.07	109276678	33.36	5585	0.19

Month(15-16)	Total			Street Lights compare with Total					
	Unit	Revenue	Consumer	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	64658023	407819315	262786	28106	0.06	199383	0.07	57	0.03
August	71692861	470519985	264949	28935	0.05	202384	0.05	57	0.03
September	65068590	412150561	267720	30132	0.05	210285	0.06	56	0.02
October	70143647	449115519	270522	29421	0.05	216329	0.06	55	0.02
November	58799880	369137729	272796	31796	0.06	227764	0.07	54	0.02
December	49835574	328599837	276253	32276	0.08	231206	0.08	54	0.02
January	52382873	352352858	279784	32091	0.07	229879	0.08	53	0.02
February	48985849	355410763	282866	39624	0.08	283891	0.09	53	0.02
March	62335588	418137306	285549	37829	0.07	271021	0.07	53	0.02
April	70386980	466920030	288601	37401	0.06	267521	0.07	53	0.02
May	77354688	512855351	291166	36809	0.06	263207	0.07	53	0.02
June	68890526	445975362	292635	399574	0.06	2856916	0.07	651	0.02

Comparison of Total, Domestic, Lifeline and Minimum Consumer

Table 4.3: Compare Domestic with Total Domestic and Commercial (2016-2017)

Month(16-17)	Total			Domestic compare with Total					
	Unit	Revenue	Consumer	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consume
July	48831492	295851765	220152	40081627	61.99	201876207	49.5	232338	88.41
August	60147171	373625596	226121	34853897	48.62	170337627	36.20	234347	88.45
Septembe	56675073	352515126	231427	379520008	58.33	187156951	45.41	236850	88.47
October	59266605	380919232	243648	38816829	55.34	191968087	42.74	239303	88.45972
Novembe	50340155	319900852	244000	35934616	61.11	177086045	47.97	241138	88.39499
Decembe	42096513	272926320	243485	23165095	46.48	107978145	32.86	244229	88.40773
January	45026102	297066127	248095	202266092	38.69	93501189	26.54	246947	88.26345
February	48823272	316083411	251979	20929456	42.73	96736359	27.22	249521	88.21173
March	58131037	376895571	251641	22410091	35.95	104010807	24.87	251802	88.18171
April	63543895	406835705	255162	30308036	43.06	144206091	30.88	254448	88.17
May	62023336	394475180	259095	34633666	44.77	167518953	32.66	256767	88.18578
June	662416450	4223905880	2893187	36274341	52.66	175797900	39.42	258271	88.25704

Month(16-17)	Domestic compare with Total						Lifeline compare with Domestic					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consume	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consume
July	40081627	61.99	201876207	49.5	232338	88.41	4044399	6.26	14896236	3.65	26178	9.96
August	34853897	48.62	170337627	36.20	234347	88.45	4009083	5.59	14743244	3.13	34988	13.21
Septembe	379520008	58.33	187156951	45.41	236850	88.47	4327555	6.65	15693955	3.81	28946	10.81
October	38816829	55.34	191968087	42.74	239303	88.45972	4102656	5.85	14876234	3.31	28005	10.35
Novembe	35934616	61.11	177086045	47.97	241138	88.39499	3727067	6.34	13669920	3.7	28845	10.57
Decembe	23165095	46.48	107978145	32.86	244229	88.40773	6934262	13.91	25391655	7.73	244229	88.41
January	202266092	38.69	93501189	26.54	246947	88.26345	5423034	10.35	2006784	5.68	57363	20.50
February	20929456	42.73	96736359	27.22	249521	88.21173	5314302	10.85	20131325	5.66	60511	21.39
March	22410091	35.95	104010807	24.87	251802	88.18171	5119288	8.21	19072663	4.56	52535	18.40
April	30308036	43.06	144206091	30.88	254448	88.17	4507760	6.4	16634539	3.56	39597	13.72
May	34633666	44.77	167518953	32.66	256767	88.18578	5328650	6.89	19471484	3.8	37943	13.03
June	36274341	52.66	175797900	39.42	258271	88.25704	4558006	6.62	16835410	3.77	35717	12.21

Month(16-17)	Slab 1-75 compare with domestic					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consume
July	11208160	17.33	44132368	10.82	35855	13.64
August	12410633	17.31	48797720	10.37	41360	15.61
Septembe	10362178	15.93	40607766	9.85	36812	13.75
October	10657655	15.19	41611724	9.27	39193	14.49
Novembe	9522632	16.19	37619787	10.19	40246	14.75
Decembe	7442679	14.93	30572685	9.30	48939	17.72
January	8119588	15.5	32450884	9.21	58167	20.79
February	9014371	18.4	35923400	10.11	56269	19.89
March	9724653	15.6	38988911	9.32	62565	21.91
April	12659411	17.99	49822062	10.67	49431	17.13
May	12935330	16.72	51017244	9.95	44990	15.45
June	13159444	19.1	51601587	11.57	44163	15.09

Comparison of Total, Commercial, Charitable Institution and Irrigation, General Power, Large Power, 33 KV, Street Light Consumer

4.3: Compare Total Commercial, Charitable, Irrigation, General power, large power, (2016-2017)

Month(16-17)	Total			Commercial compare with Total					
	Unit	Revenue	Consumer	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consume
July	48831492	295851765	220152	5991976	9.27	60194586	14.76	21701	8.26
August	60147171	373625596	226121	6456699	9.01	64740404	13.76	21939	8.28
September	56675073	352515126	231427	5871460	9.02	59056222	14.33	22202	8.29
October	59266605	380919232	243648	5895234	8.40	59372919	13.22	22531	8.33
November	50340155	319900852	244000	5147172	8.75	52991078	14.08	22960	8.42
December	42096513	272926320	243485	4611016	9.25	46898637	14.27	23365	8.46
January	45026102	297066127	248095	5086926	9.71	51686657	14.67	23637	8.45
February	48823272	316083411	251979	539669	1.10	54642414	15.37	23912	8.45
March	58131037	376895571	251641	5683237	9.12	57381601	13.72	24232	8.49
April	63543895	406835705	255162	6476823	9.20	65187008	13.96	24567	8.51
May	62023336	394475180	259095	6717422	8.68	67550168	13.17	24778	8.51
June	662416450	4223905880	2893187	6635864	9.63	66824209	14.98	24883	8.50

Month(16-17)	Charitable Institution compare with Total						Irrigation compare with Total					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	594754	0.92	3194159	0.78	2108	0.80	276083	0.43	1221904	0.3	3131	1.19
August	515367	0.72	2779663	0.59	2119	0.80	249613	0.35	1123649	0.24	2996	1.13
Septembe	570098	0.88	3064370	0.74	2134	0.80	283917	0.44	1250602	0.30	2944	1.10
October	539828	0.77	2908501	0.65	2152	0.80	362314	0.52	1542824	0.34	2906	1.07
Novembe	505981	0.86	2733204	0.74	2165	0.79	271514	0.46	1217058	0.33	2862	1.05
Decembe	275636	0.55	1539356	0.47	2176	0.79	225161	0.45	1030130	0.31	2805	1.02
January	245481	0.47	1390148	0.39	2194	0.78	1523499	2.91	5925075	1.68	3289	1.18
February	267394	0.55	1501538	0.42	2215	0.78	3288189	6.71	12720264	3.58	3472	1.23
March	322936	0.52	1790244	0.43	2240	0.78	2873252	4.61	11144785	2.67	3487	1.22
April	41327	0.06	2560162	0.55	2258	0.78	2193731	3.12	8533568	1.83	3476	1.20
May	537153	0.69	2903410	0.57	2275	0.78	653252	0.84	2797745	0.55	3455	1.19
June	530330	0.77	2869004	0.64	2290	0.78	257653	0.37	1103326	0.25	3298	1.13

Month(16-17)	General Power compare with Total						Large Power compare with Total					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	2114979	3.27	17574354	4.31	2960	1.13	11685314	18.07	94059064	23.06	487	0.19
August	3082073	4.30	24922148	5.30	2988	1.13	22011080	30.70	172331746	36.63	500	0.19
Septembe	2327215	3.58	19143540	4.64	3024	1.13	14340735	22.04	11911638	27.15	505	0.19
October	2780846	3.96	22633908	5.04	3047	1.13	16967154	24.19	134491438	29.95	522	0.19
Novembe	2250277	3.83	18277589	4.95	3072	1.13	10155786	17.27	83497149	22.62	537	0.20
Decembe	2449022	4.91	20056740	6.10	3065	1.11	13900816	27.89	11684680	33.99	551	0.20
January	2618024	5.00	21312320	6.05	3089	1.10	16887417	32.24	134614133	38.20	562	0.20
February	2722555	5.56	22128099	6.23	3118	1.10	16732047	34.16	133334062	37.52	565	0.20
March	2947552	4.73	23950627	5.73	3152	1.10	21623579	34.69	170484396	40.77	572	0.20
April	2993589	4.25	24266818	5.2	3207	1.11	21655251	30.77	170991370	36.62	581	0.20
May	2970592	3.84	24112411	4.7	3227	1.11	24098702	31.15	189120730	36.88	600	0.21
June	2566394	3.73	21033784	4.72	3221	1.10	16478777	23.92	131495255	29.48	608	0.21

Month(16-17)	Total			Street Lights compare with Total					
	Unit	Revenue	Consumer	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	48831492	295851765	220152	38089	0.06	272386	0.07	53	0.02
August	60147171	373625596	226121	37864	0.05	270772	0.06	53	0.02
September	56675073	352515126	231427	38069	0.06	272256	0.07	54	0.02
October	59266605	380919232	243648	39534	0.06	282761	0.06	54	0.02
November	50340155	319900852	244000	41349	0.07	295770	0.08	54	0.02
December	42096513	272926320	243485	41359	0.08	295846	0.09	54	0.02
January	45026102	297066127	248095	43279	0.08	309615	0.09	54	0.02
February	48823272	316083411	251979	41524	0.08	296907	0.08	52	0.02
March	58131037	376895571	251641	40009	0.06	286040	0.07	53	0.02
April	63543895	406835705	255162	42606	0.06	278992	0.06	53	0.02
May	62023336	394475180	259095	37351	0.05	266659	0.05	53	0.02
June	662416450	4223905880	2893187	37589	0.05	268527	0.06	53	0.02

4.8 Graphical Representation

In Fig 4.6, monthly energy consumption of the slabs except Domestic are described. Nothing is abnormal in there. Irrigation slab consume more energy February to April than the other months. Consumption of Charitable Institutions and General Power are regular. Consumption of Commercial and Large Power are increased. DPBS-3 has no 33KV consumer so that it shown in the Figure.

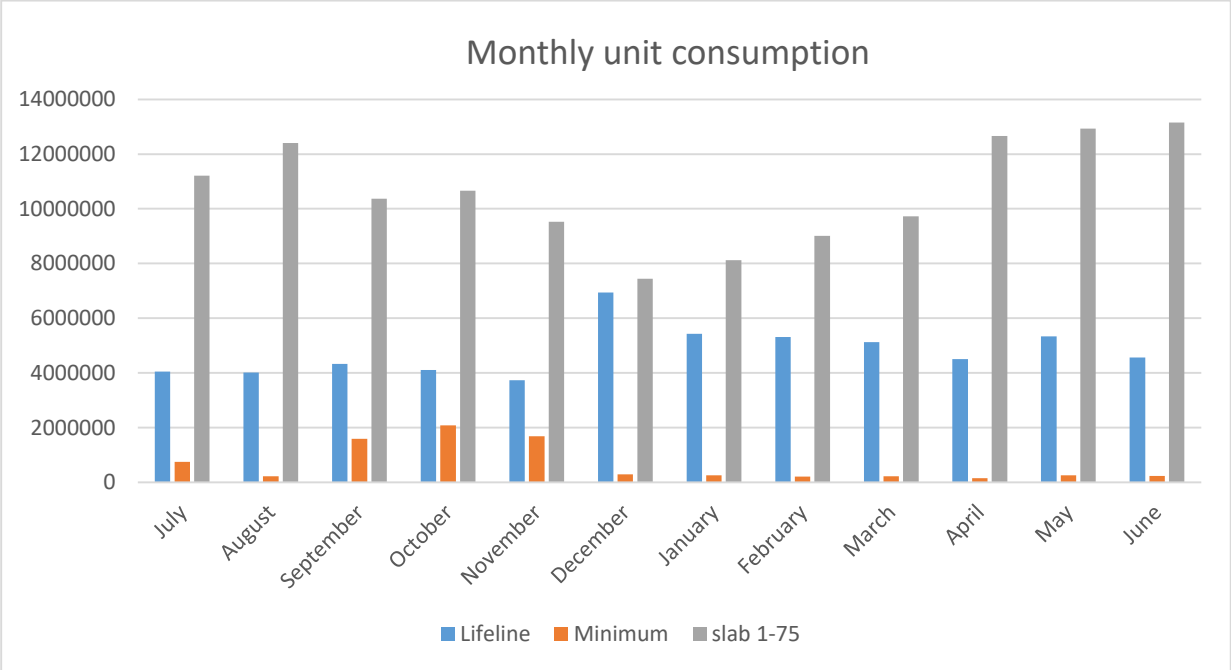

Fig 4.6 Monthly unit consumption of Lifeline, Minimum, slabs 1-75 DPBS-3 (2016-2017)

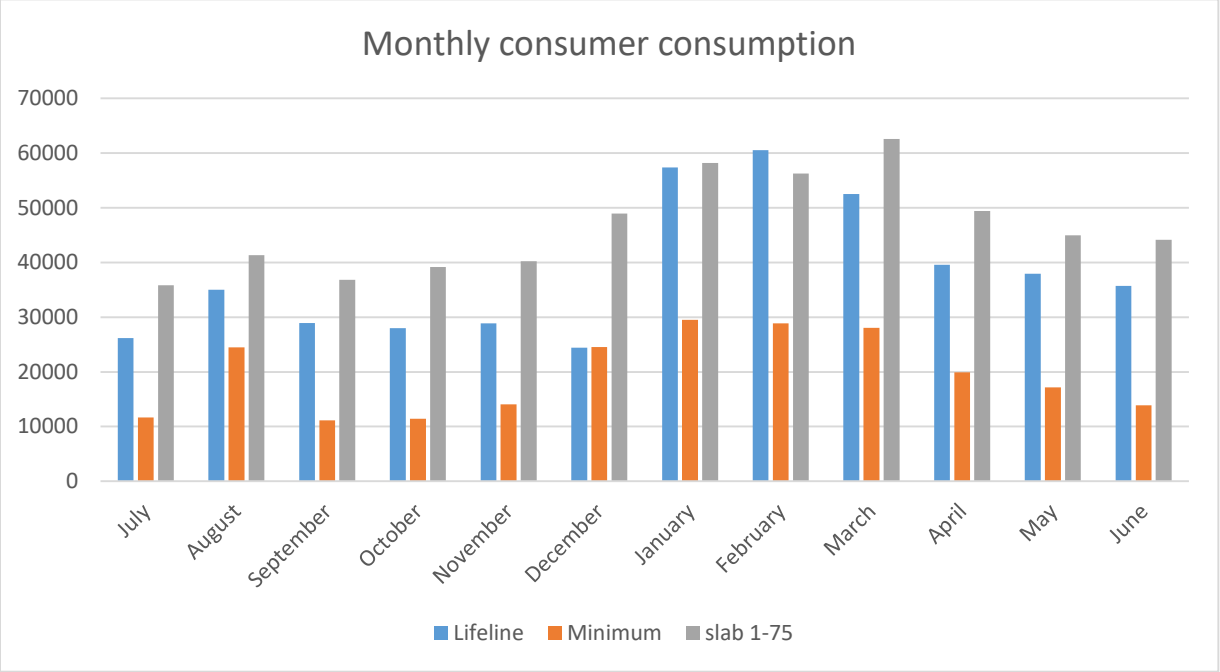

Fig 4.6 Monthly consumer consumption of Lifeline, Minimum, slabs 1-75 DPBS-3 (2016-2017)

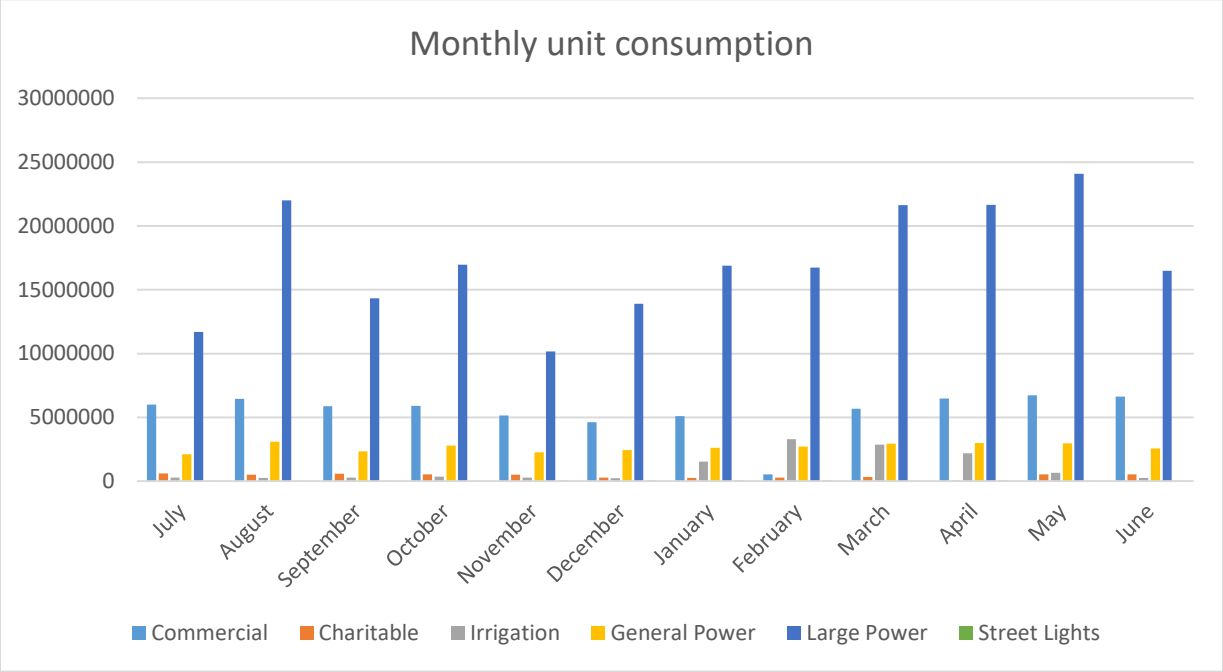

Fig 4.7 Monthly unit consumption of Commercial, Charitable, Irrigation, Large power DPBS-3 (2016-2017)

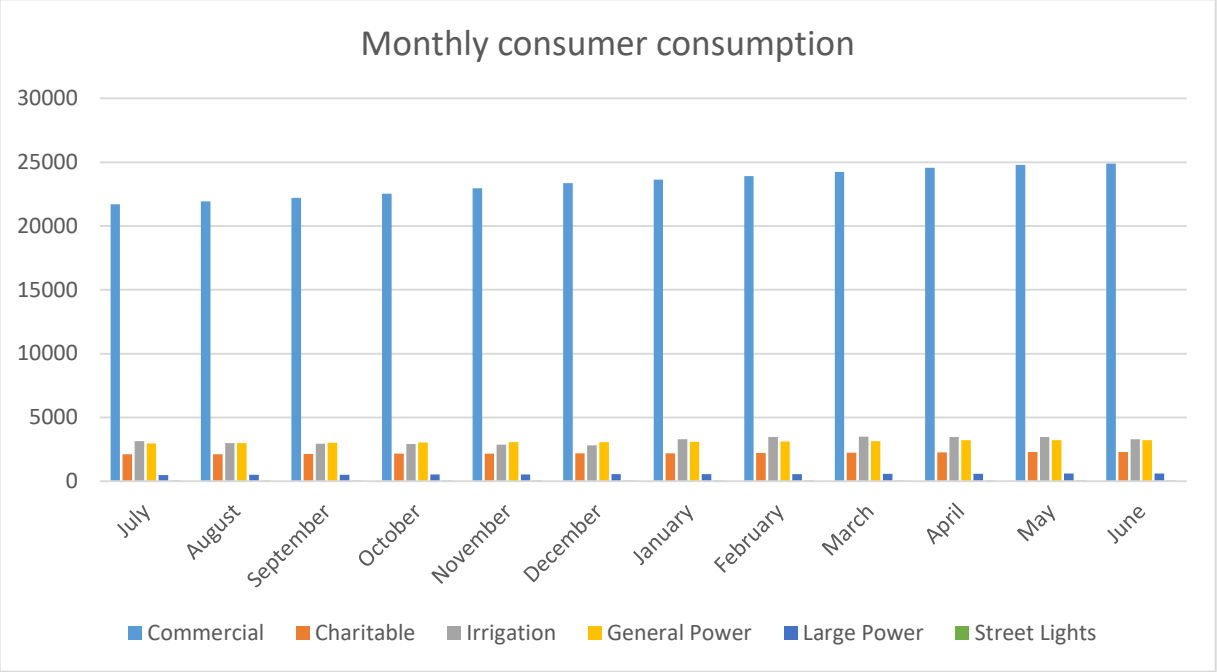

Fig 4.7 Monthly consumer consumption of Commercial, Charitable, Irrigation, Large power DPBS-3 (2016-2017)

4.9 Summary

Revenue of DPBS-3 is not sufficient to meet the profit. Wrongly included data in Domestic slabs are increasing the financial loss. Demand of all Domestic slabs is same. If demands vary in higher consuming slabs then revenue would have been increased a little and demand charge would be more effectible for PBSs. Overall energy consumption, consumer and revenue are increasing.

CHAPTER 5

ELECTRICITY COST AND RATE

5.1 Electricity Cost

Cost is an important term in any business, where profit or loss is a concern. Supplying electricity is a business also. The cost of electricity is how much one spent or pays to generate, distribute or consume electricity. Electricity is the major power source in all over the world. That's why the cost of electricity is important to improve economic and social benefits.

5.2 Electricity Purchase Cost

Electricity purchase cost is purchasing cost of electricity and consist with bulk price and wheeling charge. Bulk price is paid to the Generation Company and wheeling charge is paid to the Transmission Company by the Distribution Company. As a distribution wing, DPBS-3-1 pays BPDB or their IPPs bulk price to buying electric energy and wheeling charge to PGCB for wheeling.

5.2.1 Bulk rate

BPDB sales their generating electricity to distribution companies with the bulk rate. BERC fixed this rate as per the situation. Distribution companies also purchase electricity from some private generation companies. But the rate is much lower than bulk rate.

5.2.2 Wheeling Charge

PGCB is paid wheeling charges by the distribution companies. The company has taken infrastructure development projects for the further development of its operation. In order to finance new investment, ensure proper maintenance of its existing assets, PGCB requires being paid at better rates than what it is now getting from the distribution companies.

At the Bulk supply level, it is evident that the cost of purchase from rental power plants is the major contributor to losses. The exact quantification of losses will require a more detailed study of supply and losses at different voltage level and to the different bulk purchasers. A more immediate requirement is to address the generation plan in the short term so that lower cost of power is available in the grid. In the medium to long term, given the role of private and public sector in the generation, to enhance competitiveness, it is recommended that a concerted effort to establish a competitive dispatch regime for electricity generation through a cooperative pool. At the retail level, cross – subsidies arise between the different categories of customers

5.3 Distribution Cost

The Expense for distributing the electric energy to consumers is said to be distribution cost. Operation and maintenance cost, Consumer selling expenses, Administration and general expenses, Depreciation and amortization expenses, Tax expenses and interest expenses are included in distribution cost.

Distribution cost = Operation & maintenance + Consumer selling expenses + Administration & general Expenses + Depreciation & amortization + Tax Expenses + Interest Expenses

5.3.1 Operation & maintenance expenses (OME)

All types of expenses for operational and maintenance is included as OME. Operation supervision and Engineering, substation expenses, overhead line expenses, meter expenses, consumer installation expenses are in operation and maintenance expense.

5.3.2 Consumer selling expenses (CSE)

Consumer selling expenses are consumer related expenses. Field supervision, meter reading expenses, consumer records/collection expenses, consumer assist/demonstration/selling expenses and sales to freedom fighter are including in CSE

Table 5.1: Distribution and Total Supply Cost (2015-2016)

Month (15-16)	EC (10^7)	Distribution Cost						Total Distribution	System Loss (10^7Tk)	Total Supply Cost
		OME (10^7)	CSE (10^7)	AGE (10^7)	DAE (10^7)	TE (10^7)	IE (10^7)			
July	28.495	0.452	0.812	0.396	1.236	0.225	0.125	3.245	1.410	31.740
August	30.777	0.965	1.159	0.644	1.266	0.069	0.125	4.228	0.335	35.006
September	30.165	0.708	1.148	0.576	1.257	0.185	0.125	3.999	0.152	34.164
October	36.608	0.756	1.066	0.422	1.293	0.118	0.125	3.779	0.174	40.387
November	29.876	0.549	0.883	0.462	1.311	0.146	0.739	4.092	0.027	33.968
December	34.444	0.927	0.912	0.583	1.338	0.169	0.125	4.055	0.155	38.499
January	24.980	1.319	1.736	1.545	1.338	0.146	0.350	6.434	0.039	31.414
February	29.152	0.572	0.853	0.451	1.369	0.096	0.157	3.498	0.068	32.650
March	37.004	0.454	0.896	0.451	1.374	0.130	0.157	3.462	0.325	40.466
April	39.855	0.578	0.983	0.506	1.390	0.151	0.157	3.766	0.355	43.621
May	39.030	0.432	0.932	0.458	1.403	0.110	0.130	3.465	0.365	42.495
June	42.536	1.451	2.452	3.132	1.403	0.354	0.130	8.922	0.602	51.458
Grand total	**402.922**	**9.164**	**13.834**	**9.625**	**15.977**	**1.900**	**2.445**	**52.945**	**4.006**	**455.867**

Table 5.2: Distribution and Total Supply Cost (2016-2017)

Month (16-17)	EC (10^7)	Distribution Cost						Total Distribution	System Loss (10^7Tk)	Total Supply Cost
		OME (10^7)	CSE (10^7)	AGE (10^7)	DAE (10^7)	TE (10^7)	IE (10^7)			
July	34.993	0.720	1.233	0.614	1.422	0.017	0.215	4.220	0.230	39.213
August	40.360	0.816	1.861	0.885	1.423	0.048	0.215	5.249	0.341	45.609
September	38.766	0.864	1.715	0.657	1.425	0.258	0.215	5.134	0.256	43.900
October	43.325	0.608	1.240	0.689	1.446	0.149	0.215	4.349	0.356	47.674
November	34.769	0.623	1.348	0.612	1.456	0.207	0.215	4.461	0.029	39.230
December	37.573	0.759	1.326	0.784	1.457	0.176	0.312	4.813	0.140	42.387
January	32.371	0.778	1.223	0.082	1.465	0.145	0.215	3.909	0.098	36.280
February	32.490	0.976	1.216	0.693	1.470	0.124	0.215	4.694	0.009	37.184
March	35.975	2.341	2.698	2.285	1.479	0.108	0.215	9.127	0.109	45.102
April	44.946	0.850	1.336	0.694	1.484	0.121	0.215	4.701	0.154	49.647
May	51.799	0.909	1.367	0.745	1.487	0.161	0.215	4.885	0.356	56.684
June	45.045	1.385	1.865	0.951	1.534	0.357	-0.152	5.940	0.593	50.985
Grand total	**472.414**	**11.630**	**18.429**	**9.691**	**17.549**	**1.872**	**2.310**	**61.481**	**2.671**	**533.895**

5.1 Graphically Representation:

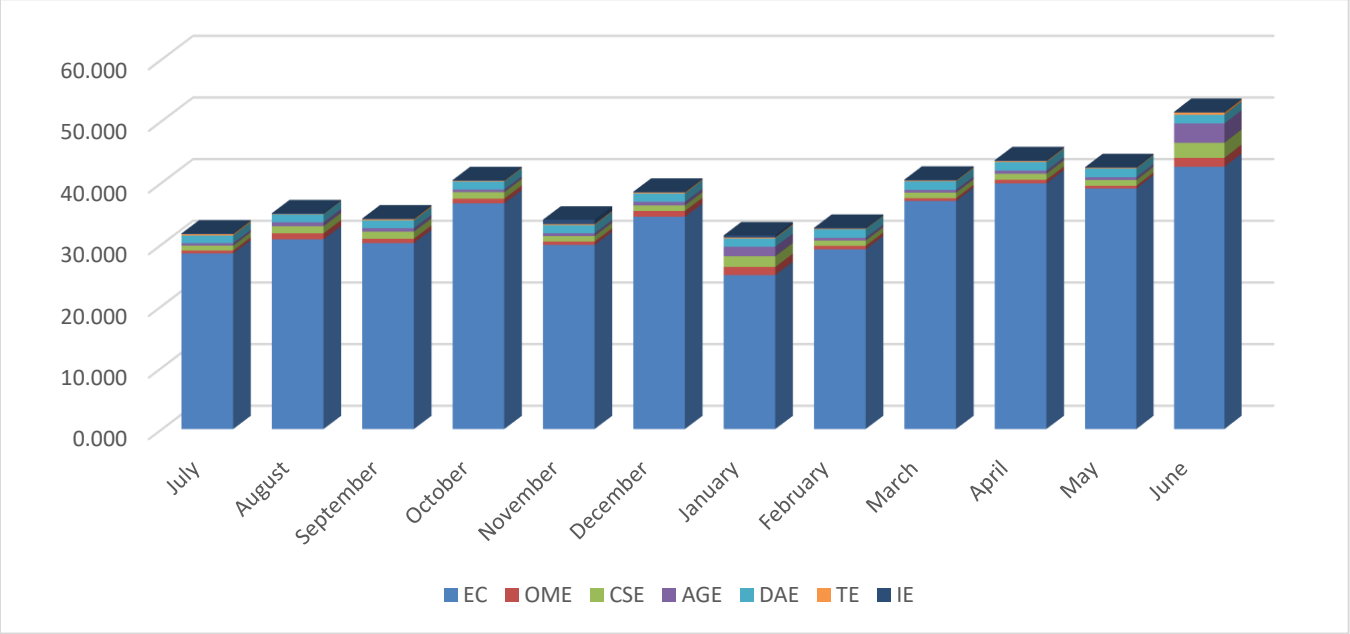

Fig 5.1: Distribution Cost of DPBS-3 in 2015-16

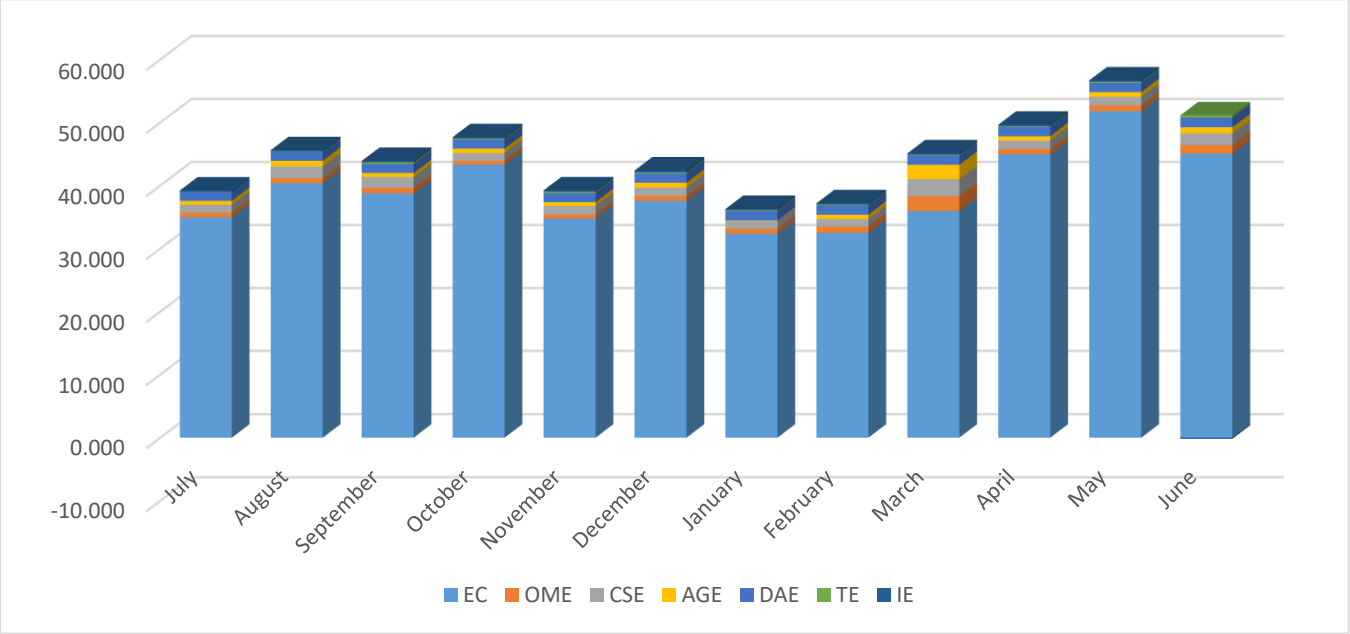

Fig 5.2: Distribution Cost of DPBS-3 in 2016-17

This table shown that in July, 2015-16 the Energy Cost is 28.495 core, total distribution cost is 3.245 Core, system loss cost is 1.410 core, so total supply cost is 31.740 core.

These table shown that in December, 2015 the Energy Cost is 34.444 core, total distribution cost is 4.055 core, system loss cost is 0.155 core, so total supply cost is 38.499 core.

These table shown that in June, 2016 the Energy Cost is 42.536 core, total distribution cost is 8.922 core, system loss cost is 0.602 core, so total supply cost is 51.458 core.

The rest of the month distribution and total supply cost analysis showed in the Table no 7.1. In March-16, April-16, May-16, June-16 the energy cost is high, system loss is high so total supply cost also high than previous months.

This table shown that in July, 2016-17 the Energy Cost is 34.993 core, total distribution cost is 4.220 Core, system loss cost is 0.230 core, so total supply cost is 39.213 core.

These table shown that in December, 2016 the Energy Cost is 37.573 core, total distribution cost is 4.813 core, system loss cost is 0.140core, so total supply cost is 42.387 core.

These table shown that in June, 2017 the Energy Cost is 45.045 core, total distribution cost is 5.940 core, system loss cost is 0.593core, so total supply cost is 50.985core.

The rest of the month distribution and total supply cost analysis showed in the Table no 7.2.InMarch-16, April-16, May-16, June-16 the energy cost is high, system loss is high so total supply cost also high than previous months.

5.3.3 Administration and General Expenses (AGE)

Administrative and General Expenses are broken into operation and maintenance expenses, with the bulk of the expenses being operation based. Operation expenses include administrative and general salaries, office supplies and expenses, administrative expenses transferred, outside services, property insurance, injuries and damages, hired service and rents. Maintenance expenses include only maintenance of general plant.

5.3.4 Depreciation & Amortization Expenses (DAE)

The depreciation expenses included as a cost is the monthly depreciation for all used and useful assets. DPBS-3 calculates 3 % depreciation of its assets.

5.3.5 Tax expenses (TE)

All type of tax is included in tax expenses such as expense for revenue stamp, municipal tax, land and development tax etc.

5.3.6 Interest expenses (IE)

Expenses of payable interest on loans from bank, BREB or from any other loans are included as IE. DPBS-3

5.3.7 System Loss (Tk)

Calculate system loss KWh in taka. System loss in taka is the help to calculate the distribution cost more correctly and showed an economical figure of system loss. DPBS-3 had a system loss in taka 2.11 in (2015-16), 0.997 (2016-17), 3.660 (2017-18)

System Loss (Tk) = Import Energy x System loss (Tk/Unit)

5.4 Revenue

The revenue is the amount of income that a PBS should have opportunity to earn in order to maintain operations and attract capital for investment, but still maintains least cost for consumers.

Table 5.2: Import energy, Purchase cost, Expenditure, Sell energy, Revenue

Month (15-16)	Energy Import (MU) 10^6	Energy Purchase Cost (10^7Tk)	Energy Sell (MU) 10^6	Distribution cost (10^7Tk)	Total Supply Cost (10^7 Tk)	Revenue from Sale Energy (10^7 Tk)	Revenue from other sources (10^7 Tk)	Total Revenue (10^7Tk)	System Loss%	Surplus (+/-) (10^7Tk)	System Loss (10^7Tk)	System Loss (Tk/Unit)	Distribution Cost (Tk/Unit)	Total Revenue (Tk/Unit)
July	66.867	30.151	53.888	3.245	34.806	31.740	0.427	32.167	19.410	-2.639	1.410	1.086	0.864	4.811
August	72.222	32.566	65.257	4.228	37.129	39.540	0.598	40.138	9.644	3.009	0.335	0.481	0.699	5.558
September	66.897	30.165	62.317	3.999	34.315	37.657	0.499	38.156	6.847	3.841	0.152	0.331	0.666	5.704
October	71.224	32.116	66.173	3.779	36.069	41.345	0.623	41.968	7.091	5.899	0.174	0.344	0.597	5.892
November	57.165	25.776	55.338	4.092	29.895	34.244	0.748	34.992	3.196	5.097	0.027	0.149	0.744	6.121
December	50.115	22.597	46.132	4.055	26.807	29.092	12.368	41.461	7.946	14.654	0.155	0.389	0.913	8.273
January	50.803	22.908	48.746	6.434	29.381	31.384	0.547	31.931	4.051	2.550	0.039	0.190	1.328	6.285
February	55.132	24.859	52.321	3.498	28.426	33.185	0.537	33.723	5.098	5.297	0.068	0.242	0.682	6.117
March	70.999	32.014	64.201	3.462	35.801	40.427	0.129	41.713	9.575	5.912	0.325	0.477	0.590	5.875
April	77.998	35.170	70.544	3.766	39.292	43.840	0.783	44.623	9.557	5.332	0.355	0.476	0.584	5.721
May	76.405	34.452	68.939	3.465	38.281	42.566	0.901	43.466	9.772	5.185	0.365	0.488	0.555	5.689
June	84.781	38.229	74.791	8.922	47.752	46.962	2.242	52.372	11.784	4.620	0.602	0.602	1.273	6.177
Grand total	**800.608**	**361.002**	**728.647**	**52.945**	**417.953**	**451.982**	**20.401**	**476.710**	**103.97**	**58.76**	**4.006**	**5.258**	**9.496**	**72.223**

Distribution cost of energy according to the Thesis Calculation (2015-2016)

Table 5.3: Import energy, Purchase cost, Expenditure, Sell energy, Revenue

Month (16-17)	Energy Import (MU) 10^6	Energy Purchase Cost (10^7Tk)	Energy Sell (MU) 10^6	Distribution cost (10^7Tk)	Total Supply Cost (10^7 Tk)	Revenue from Sale Energy (10^7 Tk)	Revenue from other sources (10^7 Tk)	Total Revenue (10^7Tk)	System Loss%	Surplus (+/-) (10^7Tk)	System Loss (10^7Tk)	System Loss (Tk/Unit)	Distribution Cost (Tk/Unit)	Total Revenue (Tk/Unit)
July	77.605	34.993	71.566	4.220	39.443	43.897	0.373	44.270	7.783	4.827	0.230	0.381	0.622	5.704
August	86.923	39.194	79.183	5.249	44.784	50.430	0.672	51.102	8.904	6.318	0.341	0.441	0.706	5.879
September	78.155	35.241	71.769	5.134	40.631	44.237	0.763	45.000	8.170	4.369	0.256	0.401	0.751	5.758
October	85.104	38.374	77.293	4.349	43.079	48.135	0.899	49.034	9.179	5.955	0.356	0.456	0.609	5.762
November	66.499	29.985	64.450	4.461	34.475	39.461	1.030	40.491	3.081	6.016	0.029	0.143	0.697	6.089
December	59.158	26.675	55.024	4.813	31.628	35.200	0.997	36.197	6.987	4.569	0.140	0.339	0.900	6.119
January	61.047	27.527	57.519	3.909	31.533	37.551	0.707	38.258	5.779	6.725	0.098	0.277	0.697	6.267
February	59.881	27.001	58.794	4.694	31.704	37.774	0.688	38.462	1.815	6.758	0.009	0.083	0.800	6.423
March	72.784	32.819	68.707	9.127	42.055	44.687	1.181	45.868	5.601	3.813	0.109	0.268	1.344	6.302
April	83.526	37.663	78.348	4.701	42.518	50.088	1.236	51.324	6.200	8.806	0.154	0.298	0.620	6.145
May	94.374	42.554	86.134	4.885	47.795	55.244	3.563	58.807	8.732	11.013	0.356	0.431	0.608	6.231
June	86.936	39.200	76.884	5.940	45.733	48.202	5.182	53.384	11.563	7.651	0.593	0.590	0.850	6.141
Grand total	**911.991**	**411.226**	**845.671**	**61.481**	**475.378**	**534.904**	**17.292**	**552.196**	**83.79**	**76.82**	**2.671**	**4.107**	**9.203**	**72.819**

Distribution cost of energy according to the Thesis Calculation (2016-2017)

Here this table shown that only in June-2016 the Dhaka PBS-3 is in 4.620 surplus that means in profit position due to increased system loss heavily. But the other months of the year is in negatives surplus that means in profit position. In Octobor-15 and May-15 the PBS is in mostly profit position.

Here this table shown that only in June-2017 the Dhaka PBS-3 is in 7.651 surplus that means in loss position due to increased system loss heavily (0.590). But the other months of the year is in negative surplus that means in profit position. In Octobor-15 and December-15 the PBS is in mostly loss position.

5.4.1 Total Revenue (TR)

Total revenue is the total earning money of a PBS. A PBS earns its revenue from two sources. One is from sales of energy to the consumers and the other is revenue from other operating sources.

Total revenue = Revenue from sales of energy + Revenue from others.

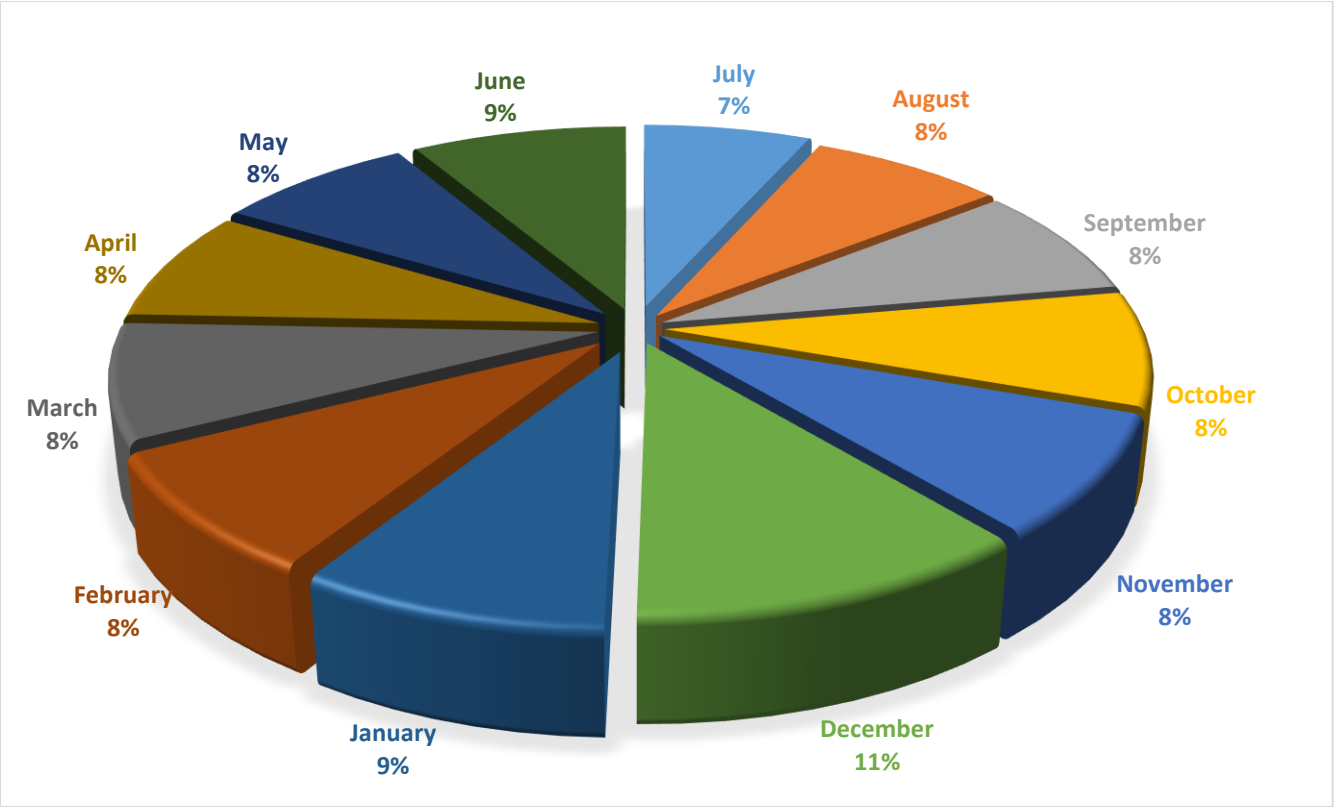

Fig 5.4: Monthly Revenue of 2015-16 (in % of Total)

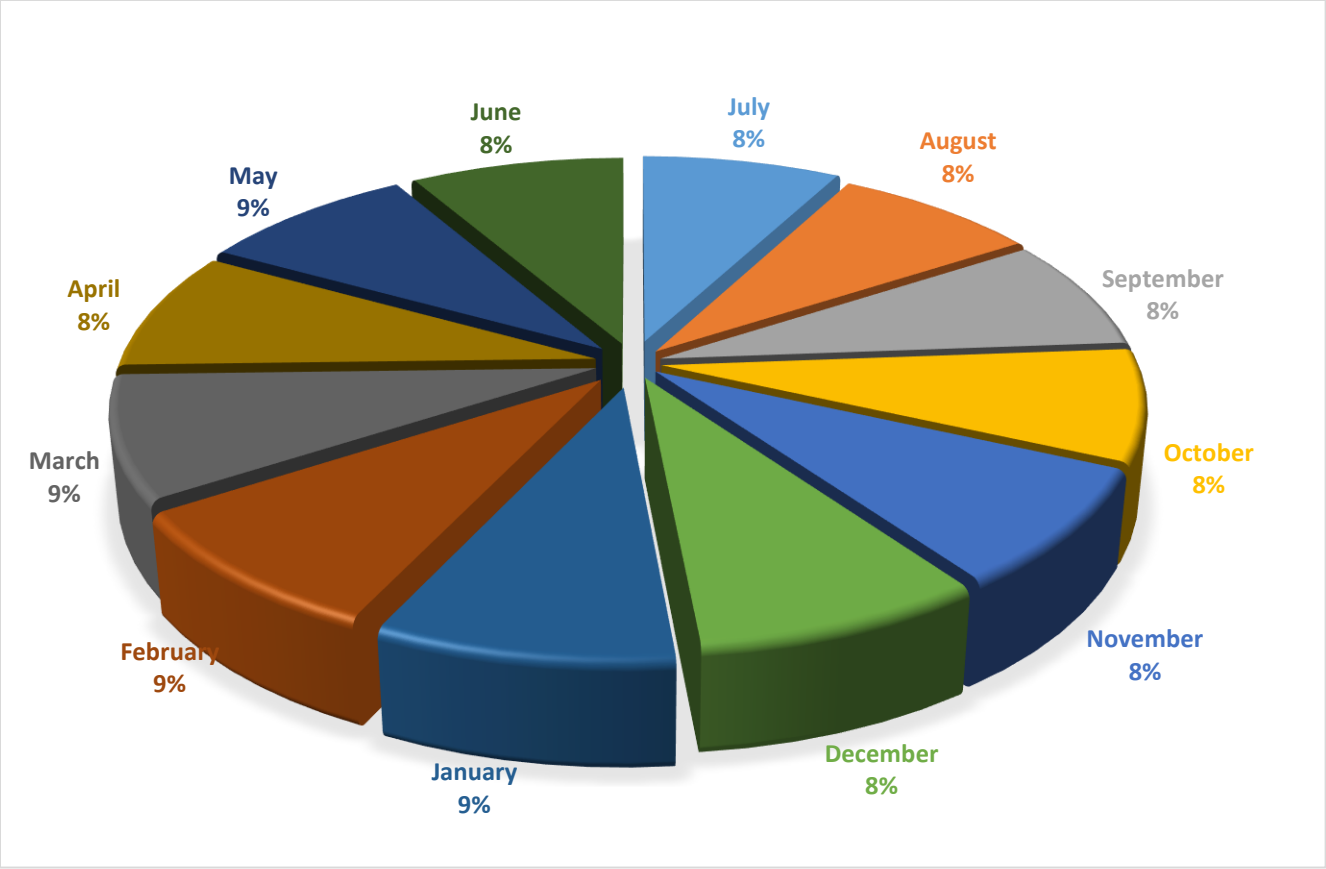

Fig 5.4: Monthly Revenue of 2016-17 (in % of Total)

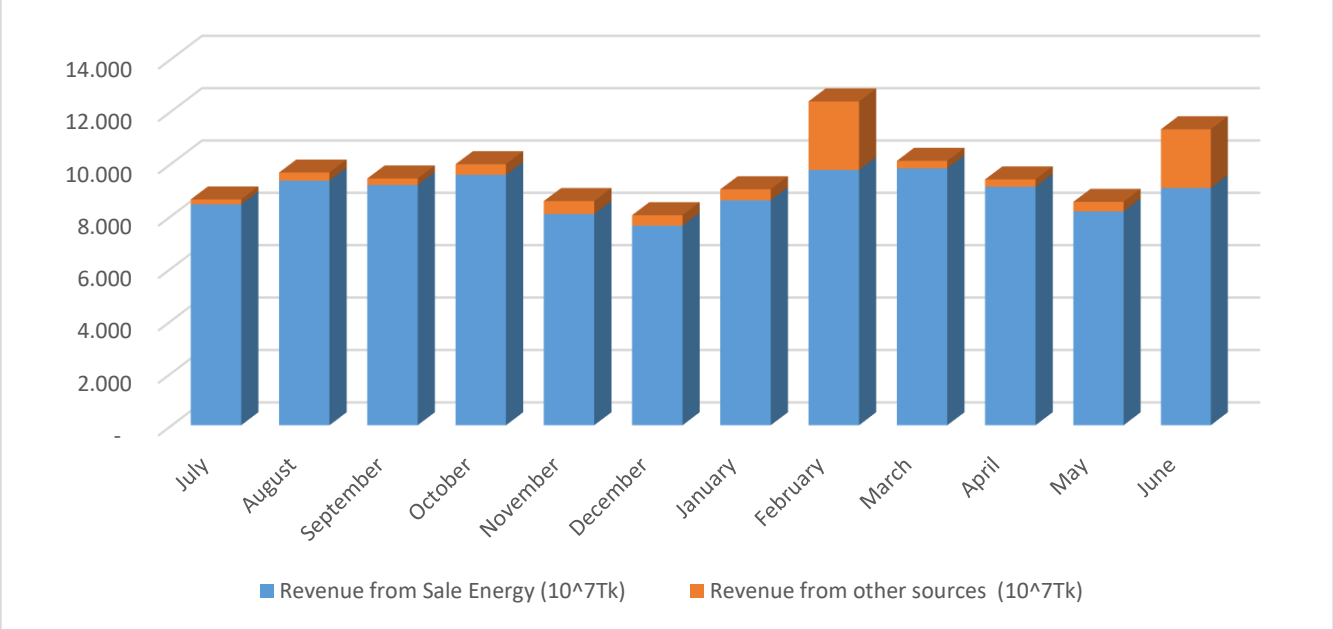

Fig 5.5 Monthly Revenue & Revenue from other of 2015-16 (Total)

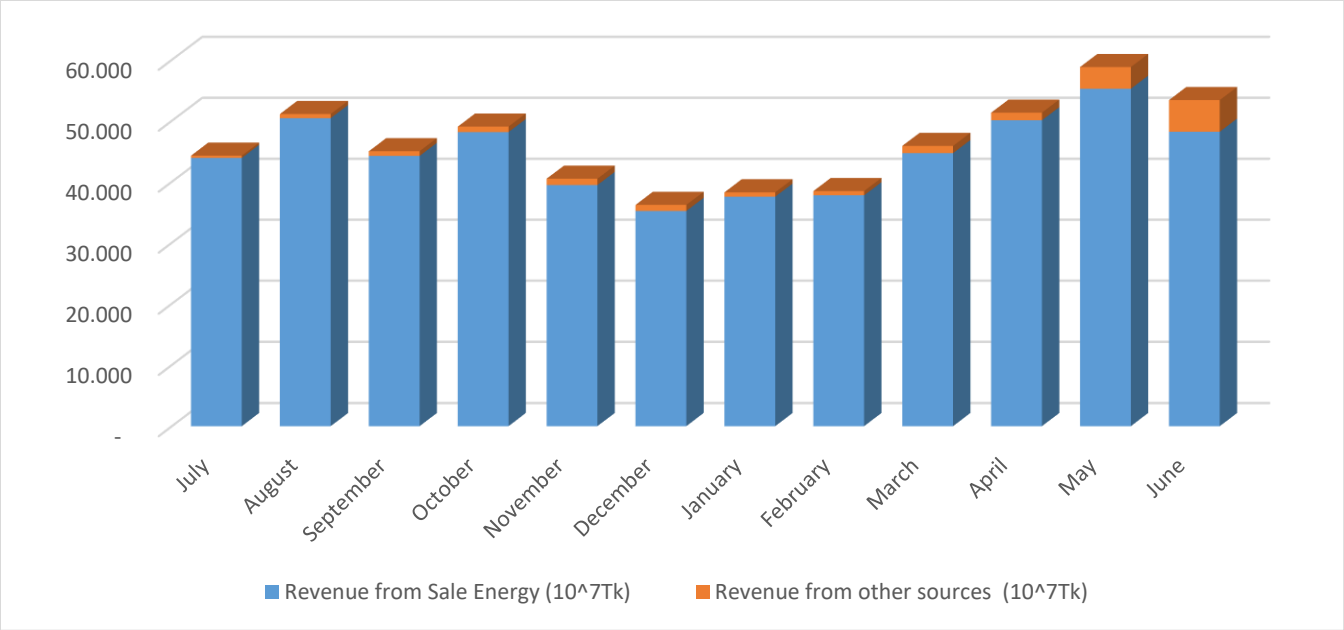

Fig 5.5 Monthly Revenue & Revenue from other of 2016-17 (Total)

In this Graph the revenue is 11% (high) in March-16 and May-16, also revenue is 9% in and October-15, revenue is 8% in August-15 and September-15 and revenue is 8% in other months of 2015-2016 years.

5.4.1.1 Revenue from Sales Energy

Revenue from only selling energy to the consumers are in this category. These amounts are collecting through the electricity bills from the consumers. Demand charge, corresponding energy rate and some other charges are included in this revenue.

5.4.1.2 Revenue from others

Revenue from others is actually the summation of operating revenue from other sources, non operating margins- interest and non-operating margins-Others.

Revenue from others = other operating revenue + Non-operating Margins- Interest + Non operating Margins-Others.

5.4.1.3 Other operating revenue

Late payment charge, miscellaneous service revenue, rent for electric property and other electric revenue are calculated as other operating revenue.

5.4.1.4 Non-operating Margins- interest

Interest from bank deposit, interest from employee loans (Home loan) related with this part. PBS calculates this as revenue and employee have to pay about 10% interest on their home loan.

5.5 Total supply cost (TC)

From purchase to supply electric energy to the consumers, the total cost is said to be the Total Supply Cost. This is the total operational expenses of a PBS. In 2015-18 fiscal year DPBS-3 showed about 131.735, 296.28 and 319.53 core taka as their total supply cost, where energy purchase cost was

Total supply cost (TC) = Energy Purchase Cost+ System Loss (in Tk.) + Distribution cost (DC)

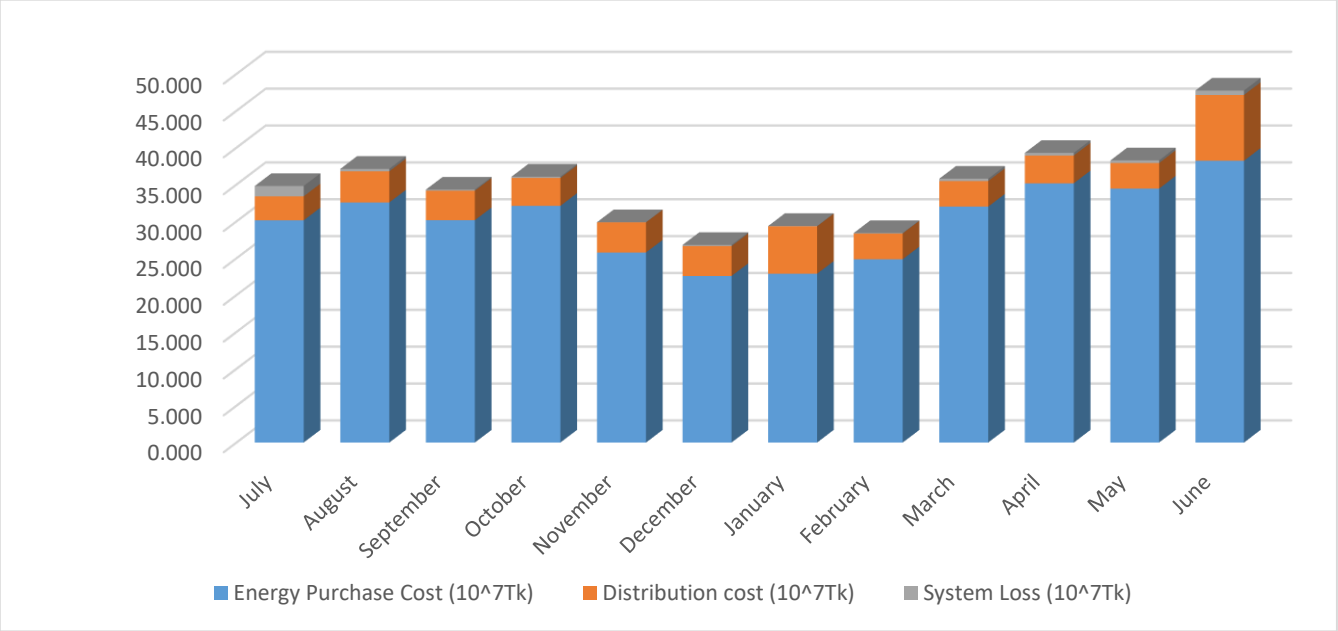

Fig 5.7: Monthly Total supply cost of DPBS-3 (2015-16) in 10^7 Tk.

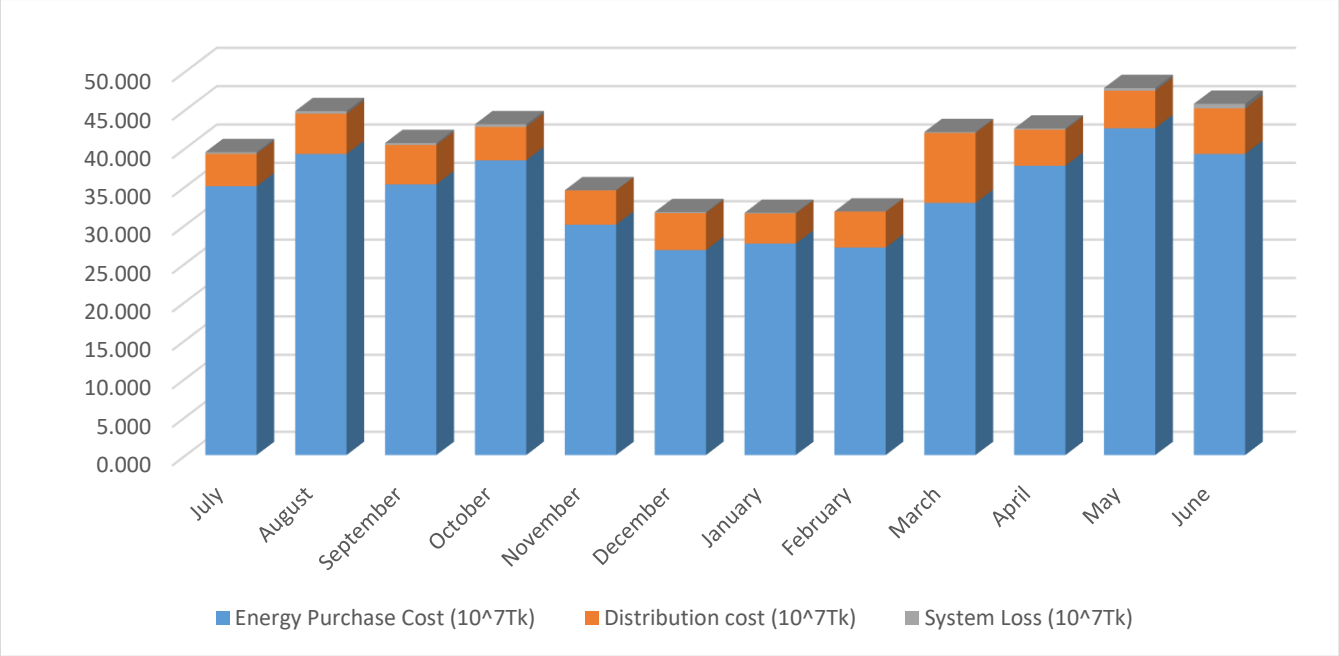

Fig 5.7: Monthly Total supply cost of DPBS-3 (2016-17) in 10^7 Tk

In this Graph the total supply cost is 14.603 Cores (highest) in Mach-16, Monthly total supply cost is high in- to May-16 except these months total supply cost is low in other months of 2015-2016 year.

In this Graph the total revenue is 131.43 Cores (highest) in April-17. Monthly total revenue is low in Nov-15 to February-16 except these months total revenue is higher in other months of 2016-2017 year.

In this Graph the total revenue is 36.87 Cores (highest) in Mach-17. Monthly total revenue is low in Nov-15 to February-16 except these months total revenue is higher in other months of 2017-2018 year.

5.6 Surplus

Surplus defines the profit or loss of a PBS. It's also known as operating margin.

Surplus = Total Revenue - Total Supply Cost

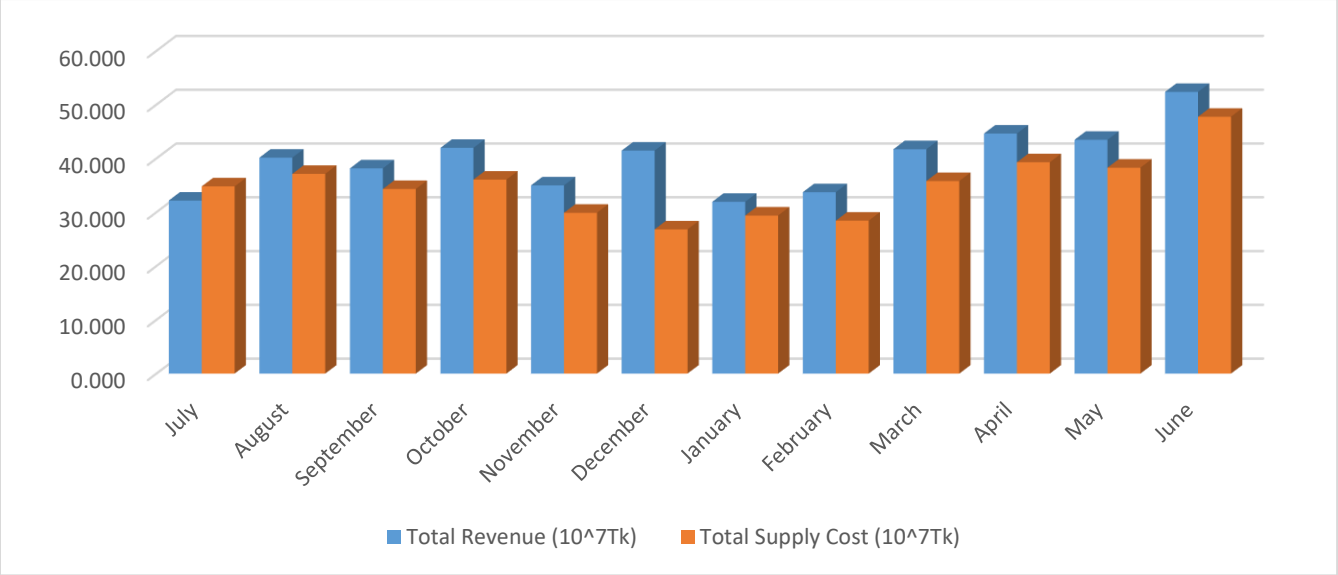

Fig 5.10: Revenue with Supply cost of DPBS-3 (2015-16)

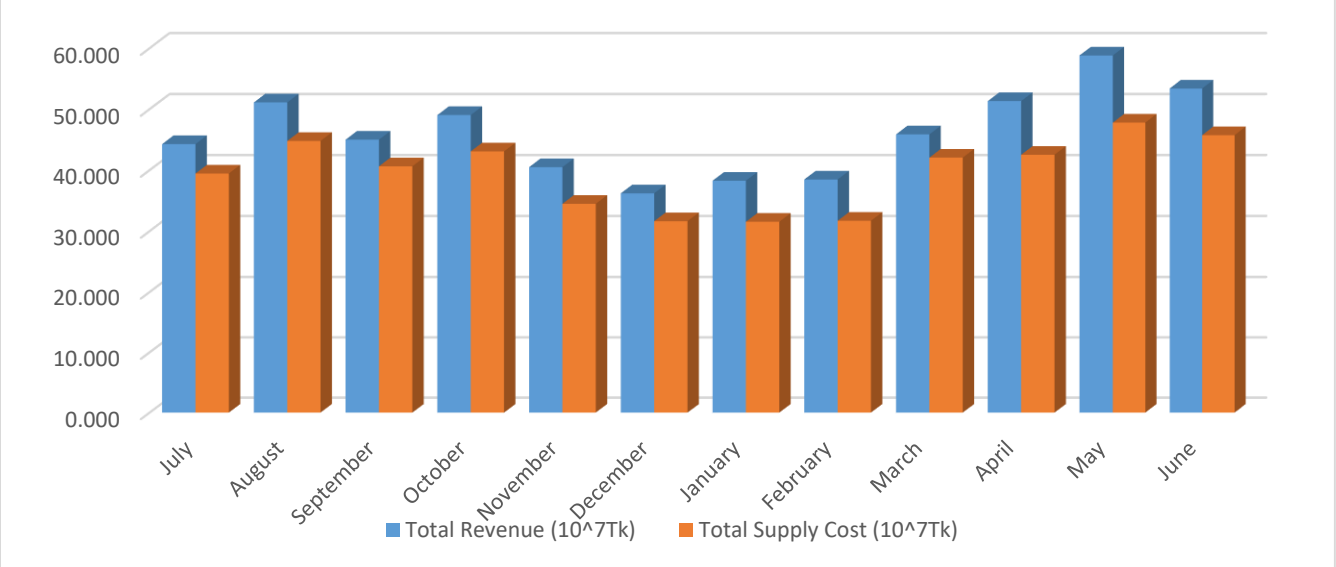

Fig 5.10: Revenue with Supply cost of DPBS-3 (2016-17

5.7 Per Unit Cost Calculation

Per unit cost calculated to find cost or revenue on each unit energy that's why we assume profit and loss in short. Here we listed some per unit calculation for DPBS-3,

5.7.1 Distribution Cost (Tk/Unit)

In July, 2015 DPBS-3 had 66.867 core taka, Total Supply Cost 34.806 core taka Energy Purchase Cost 30.151 and Energy sell is 53.888 MU. So the Distribution cost (Tk/Unit) of July, 2015 is

Distribution Cost (Tk/Unit**)** = ((Total Supply Cost - Energy Purchase Cost) / Energy Sell)*10

= ((66.867– 30.151) / 53.888) * 10

= 3.245 Tk / Unit

In July, 2016 DPBS-3 had 77.605, core taka Total Supply Cost, 39.443 core taka Energy Purchase Cost 34.993 and Energy sell is 71.566MU. So the Distribution cost (Tk/Unit) of July, 2017 is

Distribution Cost (Tk/Unit**) =** ((Total Supply Cost - Energy Purchase Cost) / Energy Sell)*10

= ((77.605– 39.443) / 71.566) * 10

= 4.220Tk / Unit

5.7.2 Revenue (Tk/Unit)

In July 2015, DPBS-3 had 32.167, core taka Total Revenue and import energy 66.867 MU.So Revenue on July 2015 was,

Revenue (Tk/Unit) =(Total Revenue / Energy Import)*10

= (32.167/ 66.867) * 10

= 4.811Tk / Unit

In July 2016, DPBS-3 had 44.270, core taka Total Revenue and import energy 77.605 MU.So Revenue on July 2016 was,

Revenue (Tk/Unit) =(Total Revenue / Energy Import)*10

= (44.270/ 77.605) * 10

= 5.705Tk / Unit

5.7.3 System Loss (Tk/Unit) (SL)

System loss (Tk/Unit) is calculated the price of each unit in system loss.

In July 2015 DPBS-3 had purchased 66.867 MU with 30.151 core taka and Energy sell is

53.888MU.

So the system loss (Tk/Unit) of July 2015 is

System loss (Tk/Unit) = ((Purchase cost/Sell Energy)-(Purchase cost/Import Energy))*10

$= ((30.151/53.888) - (\frac{30.151}{66.867}))$*10

= 1.086Tk / Unit

5.8 Tariff Rate

This is for information of all concerned that in accordance with the BERC Order Dated: 27

August 2015, the new tariff rates with respect to retail sales of electricity of Bangladesh Rural Electrification (BREB) has been made effective from bill month September 2015 as the following.

Table 5.3: Tariff Rates Since 2009 to 2016

Consumer Class	Slab	Before Dec,2009	Dec-09	Slab	1-Dec-11	1-Feb-12	1-Mar-12	Slab	1-Sep-12	Slab	Mar-14	Sep-15
Domestic	0-25	0	0	Minimum	0.00	0.00	0	Minimum	0.00	Minimum	0.00	0.00
	0-100	2.53-2.90	2.64-3.03	00-100	2.77-3.18	2.90-3.34	3.08-3.55	00-75	3.36-3.87	1-50	3.74	3.36-3.87
	101-300	2.57-2.95	2.81-3.23	101-300	3.25-3.73	3.45-3.95	3.67-4.20	76-200	4.05-4.63	1-75	3.87	3.80
	301-500	3.89-4.15	4.28-4.56	301-500	5.21-5.54	5.63-5.98	5.98-6.35	201-300	4.18-4.79	76-200	5.01	5.14
	500++	4.99-5.95	5.64-6.72	500++	6.87-8.18	7.42-8.83	7.88-9.38	301-400	6.88-7.30	201-300	5.19	5.36
								401-600	7.18-7.62	301-400	5.42	5.63
								600++	9.38	401-600	8.51	8.70
										600++	9.93	9.98
Commercial		5.11-5.15	5.62-5.66	Flat	6.80	7.33	7.79	Flat	9.00	Flat	9.58	9.80
				Off-peak	5.23	5.88	6.25	Off-peak	7.22	Off-peak	8.16	8.45
				Peak	9.31	9.66	10.26	Peak	11.85	Peak	11.85	11.98
Charitable		3.28-3.35	3.28-3.35		3.45-3.52	3.62-3.70	3.85-3.93		4.45-4.54		4.98	5.22
Irrgation		2.60-3.05	2.60-3.05		2.73-3.20	2.87-3.36	3.05-3.57		3.39-3.96		3.39-3.96	3.82
General Power		3.91-4.10	4.30-4.51	Flat	5.27	5.67	6.02	Flat	6.95	Flat	7.42	7.66
				Off-peak	4.41	4.86	5.16	Off-peak	5.96	Off-peak	6.64	6.90
				Peak	6.75	6.90	7.33	Peak	8.47	Peak	9.00	9.24
Large Power		3.80-3.95	4.18-4.34	Flat	5.14	5.55	5.90	Flat	6.81	Flat	7.32	7.57
				Off-peak	4.40	4.86	5.16	Off-peak	5.96	Off-peak	6.62	6.88
				Peak	7.55	7.60	8.08	Peak	9.33	Peak	9.33	9.57
33KV				Flat	4.88	5.28	5.61	Flat	6.48	Flat	7.20	7.49
				Off-peak	4.30	4.78	5.08	Off-peak	5.87	Off-peak	6.55	6.82
				Peak	7.34	7.44	7.91	Peak	9.14	Peak	9.28	9.52
Street Light		3.75-3.85	4.12-4.23		4.90	5.28	5.61		6.48		6.93	7.17

5.9 Bill Explanation

- **What all utility bills should contain?**

Bills–for electricity–should always be dated and contain the following information (Usually on the first page of the bill) –

- Your Name and Address.
- Your customer account or reference number (Always quote this when you contact your supplier).
- The name of your supplier and its contact details.
- How much you need to pay (Including any money owed from previous bills) and when you need to pay by.

- **More Detailed Information -**

- The following more detailed information about the amount of energy you've used is often found on a separate page of the bill–
- Billing Period – The period in which you used the energy you're being charged for.
- Meter Readings–Difference between the previous and latest reading is the amount of energy (Measured in Kilo watt Hours or Kwh) you've used.
- The amount your supplier is charging you for each KWh of electricity. If you pay a standing charge (Which covers things like meter readings and the cost of keeping you connected to the network) you'll pay a single rate; if not then you will pay a higher price for a given number of units and then a lower rate thereafter.
- Meter Number– If your supplier has changed your meter during the billing period you'll see readings for two different meter numbers. [18]

5.10 Summary

In this chapter, electricity rate, revenue and expenses or cost of DPBS-3 are calculated according to the thesis formula. System loss calculated in taka. System loss, Distribution cost and Total Revenue calculated month wise in per unit. DPBS-3 find in massive loss.

CHAPTER-6

SOCIO ECONOMIC IMPACT OF BREB IN BANGLADESH

6.1 Introduction

Extension of infrastructure in rural areas is essential for bringing any meaningful change in the rural living patterns. Before our liberation in the year 1971, we had little facilities created for the rural people. Virtually, govt. had little opportunities for expansion of the distribution network in a massive scale. In 1972, Rural Electrification Directorate (under The Bangladesh Power Development Board) was established to gear up efforts towards formation of a separate body responsible for electrifying rural areas. In 1976 NRECA conducted a feasibility study for reaching electricity to each and every rural home and other rural establishments. As a result Rural Electrification Board was formed to take up efforts at bringing changes in rural living patterns.

Over the last 38 years, the program has reached about 433 thanes of the country, thus making it a core development program. The program has brought light to many families, hitherto remaining in complete darkness. It has given them the enlightenment towards modern lining, freedom from poverty, malnutrition and hunger. Electricity has brought many families close to the rural homes. Some of them are thinking of
Rural Electric Societies have provided jobs to rural families/youths. In addition, a total of 8000 persons are employed in the construction firms and consulting offices working for the program. Rural people now have much better work-habits and an improved sense of discipline and social security, which came as a result of the assurances of basic amenities in life.

6.2 Achievement in Distribution

- The number of consumers increased from 10.8 million to more than 30.03 million;

- Distribution lines increased from 260 thousand km to 457 thousand km;
- Overall system loss reduced from 16.85% to 11.40%;
- Per capita power generation reached 464 kWh from 220 kWh;
- Access to electricity increased from 47% to 95%;
- More than 1.2 million pre-paid meters installed;
- Initiatives have been taken to introduce an underground distribution system in Dhaka;
- Initiatives are taken to replace overloaded transformers to ensure quality service to consumers;

6.3 Achievement in Transmission

- Transmission line increased from 8,000 ckt km to 11,123 ckt km.
- Grid sub-station capacity increased from 15,780 MVA to 36,046 MVA.
- Bangladesh-India 400 KV inter-connection grid line constructed and initiatives taken for the construction of 800 KV grid interconnection.
- Steps have been taken to ensure uninterrupted power supply through implementing "Grid Reliability Study" to ensure the safety of grid lines.
- Projects taken to construct 10,000 ckt km new transmission lines by 2021.

6.4 Education

Literacy rate in the rural areas has increased significantly due to the expansion of mass education program. Poor workers can attend the night schools at the end of the day's business. They can also sit beside the children to supervise their education.

6.5 TV, Satellite and Mass Media

Living pattern in rural areas have changed due to introduction of new consumer items and like Refrigerator, Television, Radio, Cassette Players, Fans etc. Villages are experiencing a kind of urbanization in the shape of civic amenities, regular education, sanitation and health care and enhanced economic activities. By dint of TV, people are now keeping informed about the latest state of sports, culture and political developments.

As the satellite has opened up the world before the eyes, people get acquainted with the world and this ensures their early socialization. The workload of women has reduced and they have sufficient time to watch TV, listen to radio and can assist children in their education. Access to resources, equality of

men and women in terms of wage/employment, women trafficking, punishing criminal offences, child trafficking, acid throwing, choice of family planning use, right to participate in the election.

6.6 NGO Activities

RE program have sped the other development activities in the rural areas. Many new infrastructure development NGOs (non-government organizations) and human development bodies have extended their activities in remote rural areas to help govt's efforts at poverty alleviation and human development. By dint of electricity, NGOs are encouraging varied human endeavors in the form of handicraft development and cross-cultural interchanges. These things ultimately reduce migration towards cities and relieve them of stagnation of infrastructures and civic amenities. On the other hand, it ensures effective and maximum utilization of human and other properties. Speedy electrification of our rural homesteads & other consumers have sped timely utilization of natural and other resources.

6.7 WOMEN Empowerment

Women of the rural areas are enjoying the benefits of electricity very well. They can do extra work after household job and add to family earnings. Women are getting self-dependent, making small groups of income generating purposes, specially rearing poultry and cattle, making vegetable farms & taking-up weaving and sewing projects and opening small shops. The use of light during evening ensures women's safe movement from one place to another. Electricity has left a profound impact on women's mobility, participation in income generating activities (IGAs), decision-making, freedom of using income and saving, better utilization of credit, knowledge about gender inequality issues, household work plan according to convenience, changes attitude in terms of reducing health care disparities, increase in

overall years of schooling for both boys and girls, preference to send girls to schools, awareness of legal issues (i.e., marriage for girls at 18 and boys at 21) and awareness about negative impact of dowry. Women in the electrified households have selected gender equality knowledge, such as, participation with husband in decision-making, purchase/sale of land/livestock, construction/repair of houses, marriage, health and education. Women spend more time on listening radio and watching TV to news and health- nutrition related program than other program. They are gaining much more knowledge and thus produce modernization effect.

About 15 areas of knowledge disseminated through radio/TV include value of good health (1), value of education (2), value of female education (3), utility of family planning (4), development of knowledge-base through news (5), improvement in agriculture practice 6), knowledge of modern

fishing (7), knowledge of pest management (8), govt. program for the distribution of Khas land (9), prohibition of dowry (10), laws about divorce (11), legal tools to combat violence against women (12), local governance issues (13), women right issues (14) and issues of human rights (15). Electricity has given them special advantage of forming micro irrigation groups in villages, thus revolutionizing the traditional concept of man-run irrigation systems.

This is helping those developing entrepreneurial skills and the qualities of leadership. This is leading to a concept of empowerment of women towards better sustainability and solid social existence. Recently, this has drawn fond attention of the development experts round the globe. Rural Electricity has acted as a leap-forward in the development of commercial activities in rural Bangladesh. Out of the total shops in Bangladesh an estimate 24% are using rural electricity.

6.8 Irrigation

Electrified commercial establishments are more attached to market. In agriculture, rural electricity program (REP) has significantly in attaining food self-sufficiency through use of productive and efficient irrigation equipment's. Both land use intensity and cropping intensity with electrified pumps (DTW/STW/LLP) is higher than diesel operated. Average yield per acre under electrified pumps is 24% higher than that of diesel operated ones. Electrified pumps contribute one-third of the food self-sufficiency in Bangladesh. REP through its electrified irrigation pumps covers 4.1 million acres of land for HYV Boro and Aman. REP irrigated land produces 6.43 million tons of HYV Boro and Aman, which is about 29% of all similar types of rice, produced in Bangladesh. 20% rebate to the electric bill to the irrigation pumps sanctioned by govt. induces the farmer to enhance the agricultural growth. As agricultural productivity has increased, availability of rice & other food items in villages have helped rural people maintain better food habits.

6.9 Industry

Industry is the second highest consumer of rural electricity-using 41.53% of the total MWH. A substantial growth in industrial output and value has been added to the national economy. RE-connected industries have strengthened the local industrial base by promoting backward and forward linkages and diversification, which later forms agglomeration by attracting and generating, diversified services. Rural Electrification fits in quite comfortably with the current buzzword in the lexicons of development partners such as poverty alleviation health care, education, food production etc.

6.10 Other findings and assessments about impact of the REB:

The program in Bangladesh has already witnessed with manifold and for reaching socioeconomic impact in the electrified areas as stated above. A recent USAID study's findings and assessments about impact of the rural electrification program in Bangladesh are the following:-

1. Presently 55.41% villages and 5.08 million rural households are electrified and no. of beneficiaries are 30.5 million.
2. 93.7% at the electrified households (HHs) reported decrease in fuel cost. Average electrified HHs monthly Kerosene savings 1.7 liters in comparison to non-electric HHs, which is 8.6-million liter Kerosene, and of value US$ 3.74 million.
3. Literacy rate in the electrified HHs is 71%, where 54% in the un-electrified HHs.
4. Electrified HHs use daily 50 minutes more than that of non-electrified HHs between sunset and sleep.
5. In the electrified HHs students study 23 minutes more than the non-electrified HHs daily.
6. 78.2% HHs reported an increase on working house.
7. 62.0 % HHs reported an increase in HHs income.
8. 81% HHs reported an increase in reading habits
9. 93.7% reported an increase in children's study time.
10. 92.0% reported an increase in amusement as well as standard of living.
11. 94.7% reported an improvement in security.
12. Electrified HHs per capita daily food intake 96 gram, 164 Kil. Cal. and per capita protein 46 gram more than that of non-electrified HHs.
13. The annual infant mortality rate in the electrified HHs is 42.7/1000 live births, in the non electrified HHs 57.8/1000. Thus annual number of infant deaths that could be saved will be around 36818, i.e., a saving of 101 infant deaths every day.

14. About 68% of currently married women in the electrified HHs reported of using contraceptive methods, where in the non-electrified HHs the rate is 63%.
15. 61% electrified HHs use hygiene latrine, where only 29% non-electrified HHs use the same latrine.
16. Over 50% Electrified HHs possess TV, TV watching was reported by 70% HHs.
17. Women of the electrified HHs watch TV by 65 minutes; use 56 minutes in income generating and 161 minutes in socio-cultural activities at night daily.
18. 64% women of the electrified HHs reported TV as the main source of knowledge.
19. 11% women of the electrified HHs involve in income generating in handicraft/sewing activities.

20. 53% women of the electrified HHs reported allowing young girls/women to work outside the village.
21. 71% women of the electrified HHs reported that a couple should have two children.
22. Around 25% electrified HHs have radio sets, 39% women listen radio on an average about 27 minutes per day
23. About 18.8 million Bulb, 2.3 million tube light, 8.5 million electric fan, 2.7 million TV, 1.5 million electric iron, .3 million refrigerator, .2 million mobile phone, .1 million juice machine are using in the electrified HHs.
24. Each electric irrigation pump (DTW/STW/LLP) has 12 acres more command area than diesel pumps.
25. Yield of rice by each electric pump 68 kg more than that produced by diesel pump.
26. Total operation cost (price of pump, material cost, labor cost) of each electric pump is US$111 less than that of diesel pump.
27. Annual energy cost (diesel) saving by all electric pumps $2.41 million by not using diesel.
28. Out of all electrified industries 38.5% are as food manufacturing, 20.5% as textile, 13.5% as wood/wood product, 10.3% as metal/metal product, 12.8% as handicrafts, 4.4% as others.
29. Electrified shops remain open about 99 more minutes after sunset in comparison with the un-electrified shops.
30. Creates 5.06 million direct employment opportunities in the electrified irrigation pumps, industries and commercial shops.

6.11 Conclusion:

Based on the empirical findings presented above it would be pertinent to conclude that rural electricity has profound and far-reaching economic, socio-cultural and demographic impacts on life and living of the rural people in Bangladesh. It has significant and sustained impact on agricultural growth, industrialization and business and commercial activities. It has impact on human capital formation through knowledge building mediated through electricity-driven media exposure. Thus, in order to accelerate the process of economic growth, strengthening pro-poor orientation in the growth process, attain the millennium development goal with an emphasis to PRSP and to further boost up human development in Bangladesh access to electricity of the households and social and economic institutions should be expanded within shortest time

CHAPTER 7

CONCLUSIONS

7.1 Conclusions

Electricity distribution cost is important issue in our country. Because electricity tariff rate and distribution cost are related with our economic growth. When electricity tariff rate becomes high then poor people of our country suffers a lot. By thinking about them, electricity tariff rate of our country should be low.

Government has given highest priority to power development in Bangladesh and is committed to generating electricity will sufficient for all citizens by 2021. Our government should take step for improvement our power station. In our power station, generators efficiency rate is low. It should be increased to a high value by taking necessary steps.

7.2 Limitations of the Work

There are few limitations I have faced are mentioned below-

- In this study the data of SPBS. I have used are collected from BERC (Bangladesh Energy Regulatory Commission) but some of these data are assumption.
- The distribution cost of SPBS I have calculated are almost the same as that given by BERC. The slight difference of cost caused by the data that are assumption.
- In this thesis, I have discussed about electricity distribution structure and calculated the distribution cost of several power plants. But the tariff rate of electric power depends on generating, transmission, distribution cost. To calculate the tariff rate of electric power, transmission and distribution cost needs to be calculated along with the generation cost.

7.3 Future Outline

Usually, Tariff rate of electrical power depends on transmission and distribution cost. If electricity supply costs are high then electrical tariff rate will high and committed negative result. In this paper, we discussed about Distribution cost of a PBS, how to calculate, with example. We also discussed about important terms. Interested people can study to calculate the Distribution cost and electricity tariff. This paper will also be helpful to get knowledge a stable electricity distribution structure to meet the future electricity crisis of Bangladesh.

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APPENDIX- A

1. Organization and function of BREB

After starting functioning REB has gone to a lot of changes. But to ensure a proper function a board was crated. It consists of a Chairman, four full time members and four part time members. Also to ensure direct participation of the beneficiaries, each project area should form an electric cooperative, called a Palli Bidyu Samity (PBS).These PBS consists of several members. But PBS is directed by a member of REB.A organization chart of REB is given below:

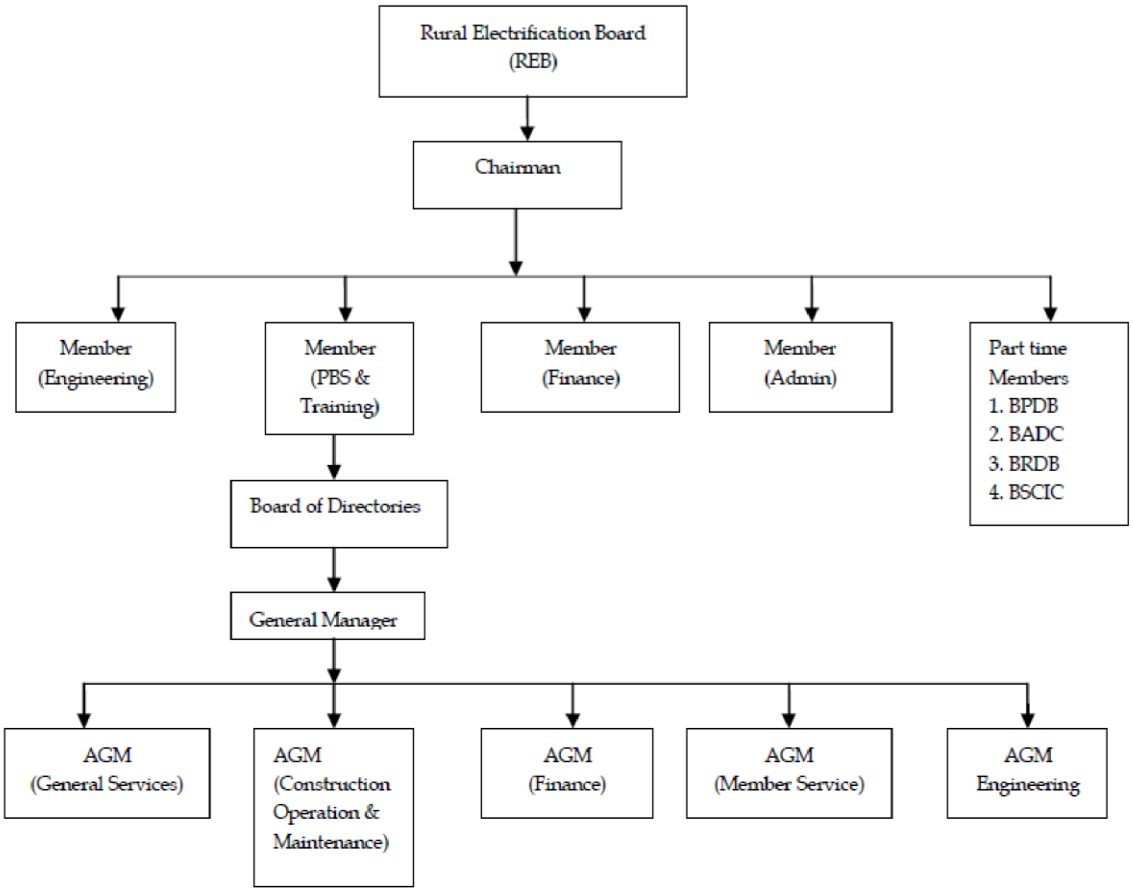

Fig 9.1. Organogram of REB

APPENDIX- B

Formula According to Thesis

Total revenue = Revenue from sales of energy + revenue from others

Revenue from others = other operating revenue + Non-operating Margins- interest+ Nonoperation Margins-Others

Distribution cost = Operation & maintenance+ Consumer selling expenses + Administration & general Expenses + Depreciation & amortization +Tax Expenses+ Interest Expenses

Total supply cost = Energy Purchase Cost+ System Loss + Distribution cost

System Loss (Tk) = Import Energy×System loss (Tk/Unit)

Surplus (Tk) =Total Revenue − Total supply cost

Energy Purchase Cost =Energy×Rate

System loss (Tk/Unit) $= \left(\frac{\text{Purchase cost}}{\text{Sell Energy}} - \frac{\text{Purchase cost}}{\text{Import Energy}}\right) \times 10$

System Loss % $= \frac{\text{Energy Import} - \text{Energy Sell}}{\text{Energy Import}} \times 100$

Distribution Cost (Tk/Unit) $= \frac{\text{Total Supply Cost} - \text{Energy Purchase Cost}}{\text{Energy Sell}} \times 10$

Total Revenue (Tk/Unit) $= \frac{\text{Revenue from other sources}}{\text{Energy Import}} \times 10$

Load Factor $= \frac{\text{Total Unit kWh(Purchase)}}{(\text{Total Peak demand} \times 1000) \times 24 \times 30)} \times 100$

Unit KWh (Purchase) % $= \frac{\text{Reference grid unit KWh}}{\text{Total Unit KWh purchase}} \times 100$

Increment % $= \frac{\text{Present value} - \text{Past value}}{\text{Past value}} \times 100$

Grand Total = Sum of all values

APPENDIX- C

1. Monthly Energy Import from DPBS-3

Import point	July'15			August'15		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit KWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	49,022,400			54,100,320		
Kalyanpur	7,768,260			7,751,340		
Manikgang	4,007,430			4,029,782		
Amin Bazar Super	30,960	**53,887,610**	**19.41**	31,830	**65,257,184**	**9.64**
Dhaka PBS-1	6,037,520			6,308,862		
Dhamrai Grid	0			0		
Total	**66,866,570**			**72,222,134**		

Import point	September'15			October'15		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	48,327,360			51,641,280		
Kalyanpur	7,477,380			7,935,840		
Manikgang	3,938,312			3,782,802		
Amin Bazar Super	31,950	**62,316,648**	**6.85**	32,910	**66,173,311**	**7.95**
Dhaka PBS-1	7,122,062			7,830,998		
Dhamrai Grid	0			0		
Total	**66,897,064**			**71,223,830**		

Import point	November'15			December'15		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	42,203,520			33,823,680		
Kalyanpur	6,393,960			5,469,300		
Manikgang	2,525,720			5,620,569		
Amin Bazar Super	30,720	**55,338,33**	**3.20**	28,530	**46,132,475**	**7.95**
Dhaka PBS-1	6,011,219			5,172,478		
Dhamrai Grid	0			0		
Total	**57,165,139**			**50,114,557**		

Import point	January'16			February'16		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	35,916,000			38,103,840		
Kalyanpur	2,733,500			5,690,700		
Manikgang	6,934,225			5,613,985		
Amin Bazar Super	28,202	**48,745,588**	**4.05**	26,278	**52,320,973**	**5.10**
Dhaka PBS-1	5,191,502			5,696,910		
Dhamrai Grid	0			0		
Total	**50,803,429**			**55,131,713**		

Import point	March'16			April'16		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	51,629,280			56,456,640		
Kalyanpur	8,021,340			8,989,740		
Manikgang	4,425,322			4,904,181		
Amin Bazar Super	32,220	**64,201,237**	**9.57**	34,680	**70,543,865**	**9.56**
Dhaka PBS-1	6,891,113			7,613,089		
Dhamrai Grid	0			0		
Total	**70,999,275**			**77,998,330**		

Import point	May'16			June'16		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	57,246,240			63,372,200		
Kalyanpur	8,734,140			9,318,780		
Manikgang	3,593,095			5,316,988		
Amin Bazar Super	33,720	**68,938,830**	**9.77**	34,800	**74,790,566**	**11.78**
Dhaka PBS-1	6,797,969			6,738,196		
Dhamrai Grid	0			0		
Total	**76,405,164**			**84,780,964**		

Import point	July'16			August'16		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	56,104,861			65,393,258		
Kalyanpur	8,877,420			9,685,800		
Manikgang	5,663,748			5,135,352		
Amin Bazar Super	34,200	**71,565,511**	**7.78**	34,920	**79,183,469**	**8.90**
Dhaka PBS-1	6,925,159			6,673,529		
Dhamrai Grid	0			0		
Total	**77,605,388**			**86,922,859**		

Import point	September'16			October'16		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	59,726,520			64,045,680		
Kalyanpur	7,291,620			9,460,080		
Manikgang	4,970,228			5,234,426		
Amin Bazar Super	33,060	**71,769,476**	**8.17**	34,650	**77,292,878**	**9.18**
Dhaka PBS-1	6,133,152			6,329,653		
Dhamrai Grid	0			0		
Total	**78,154,580**			**85,104,489**		

Import point	November'16			December'16		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	51,327,960			48,363,420		
Kalyanpur	6,925,101			3,066,660		
Manikgang	3,665,750			3,797,850		
Amin Bazar Super	30,570	**64,449,960**	**3.08**	29,700	**55,024,134**	**6.99**
Dhaka PBS-1	4,549,336			3,899,927		
Dhamrai Grid	0			0		
Total	**66,498,717**			**59,157,557**		

Import point	January'17			February'17		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	47,017,896			43,593,660		
Kalyanpur	4,520,520			6,633,540		
Manikgang	5,828,875			5,663,751		
Amin Bazar Super	27,180	**57,518,831**	**5.78**	27,660	**58,794,193**	**1.81**
Dhaka PBS-1	3,652,344			3,962,122		
Dhamrai Grid	0			0		
Total	**61,046,815**			**59,880,733**		

Import point	March'17			April'17		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	54,582,240			62,943,240		
Kalyanpur	7,543,080			8,790,660		
Manikgang	5,597,702			6,274,711		
Amin Bazar Super	29,790	**68,707,186**	**5.60**	29,580	**78,347,621**	**6.20**
Dhaka PBS-1	5,031,317			5,487,804		
Dhamrai Grid	0			0		
Total	**72,784,129**			**83,525,995**		

Import point	May'17			June'17		
	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %	Unit kWh(Purchase)	Total KWh(sold)	Grid SL %
Savar	72,676,020			66,823,824		
Kalyanpur	10,042,920			9,621,984		
Manikgang	6,109,587			6,126,100		
Amin Bazar Super	31,530	**86,133,582**	**8.73**	28,290	**76,883,659**	**11.56**
Dhaka PBS-1	5,514,286			4,335,680		
Dhamrai Grid	0			0		
Total	**94,374,343**			**86,935,878**		

2. As per Sub-station Meter Data (2015-16)

Sub-Station	July'15					August'15				
	Peak Demand(	Unit kWh(Purchase	Total KWh(sold)	Substatio n SL %	Load Factor	Peak Demand(MW	Unit kWh(Purchase	Total KWh(sold)	Substatio n SL %	Load Factor
GENDA	9.5	5,560,000				9.5	5,845,476			
FULBARIA-1	0.000	-				10.500	6,589,000			
FULBARIA-2	10.500	5,687,000				0.000	-			
FAZLUL HAQUE	3.940	486,833				0.890	739,995			
JAHANGIR	12.000	5,196,174				12.000	5,530,000			
BISHMILE DESA	3.500	7,504,455				3.500	7,579,549			
RAJASHAN	15.380	6,133,790				15.380	6,552,070			
AMTRANET	1	243,485				1	330,385			
AMINBAZAR-1	8.500	4,070,600				8.500	4,137,032			
AMINBAZAR-2	8.400	3,407,250				8.400	3,671,250			
TANNERY-1	7.500	3,569,420				7.500	4,229,915			
TANNERY-2	4.400	1,748,545	**53,887,610**	**18.13**	**69.88**	4.400	1,884,642	**65,257,184**	**7.84**	**76.97**
DHAMRAI	14.500	6,381,705				14.500	6,674,580			
BSCIC DHAMRAI	10.500	4,248,750				10.500	4,479,750			
NAYARHAT RADIO	1.350	418,510				1.350	589,140			
HYCINTH FEBRICS	1.100	173,250				1.100	243,375			
MOHISHASHI	8.500	3,734,820				8.500	3,638,660			
DAIRY FIRM	2.200	4,032,305				2.200	4,243,755			
RADIO SAVAR	1.250	96,692				1.250	75,175			
AMIN BAZAR	0.000	30,960				0.000	31,830			
DHAKA PBS-1	0	470,002				0.000	521,791			
POLICE TOWN	6.800	2,630,000				6.800	3,223,550			
total	**130.820**	**65,824,546**				**127.770**	**70,810,920**			

Sub-Station	September'15					October'15				
	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Load Factor	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Load Factor
GENDA	9.5	5,452,229				9.5	5,644,392			
FULBARIA-1	10.500	11,219,230				9.500	6,528,060			
FULBARIA-2	0.000	(5,687,000)				-	-			
FAZLUL HAQUE	0.940	666,559				0.91	1,039,170			
JAHANGIR	12.000	5,744,665				11	6,152,000			
BISHMILE DESA	3.500	5,690,524				3.5	5,302,286			
RAJASHAN	15.380	5,775,700				13.500	6,244,920			
AMTRANET	1	221,870				1.000	291,170			
AMINBAZAR-1	8.500	4,180,918				7.400	4,154,990			
AMINBAZAR-2	8.400	3,423,750				7.300	3,572,250			
TANNERY-1	7.500	3,530,508				6.500	3,914,003			
TANNERY-2	4.400	1,630,950	**62,316,648**	**3.32**	**68.54**	4.400	1,822,615	**66,173,311**	**3.12**	**79.047824**
DHAMRAI	14.500	6,389,625				12.500	6,397,215			
BSCIC DHAMRAI	10.500	4,257,000				9.500	4,422,000			
NAYARHAT RADIO	1.350	484,210				1.350	517,680			
HYCINTH FEBRICS	1.100	226,875				1.100	235,125			
MOHISHASHI	8.500	3,615,500				7.500	3,437,370			
DAIRY FIRM	5.000	4,093,410				6.500	4,767,958			
RADIO SAVAR	1.250	125,973				1.250	126,514			
AMIN BAZAR	0.000	31,950				0	32,910			
DHAKA PBS-1	0.000	530,129				0.000	508,389			
POLICE TOWN	6.800	2,850,400				5.8	3,191,994			
Total	**130.620**	**64,454,975**				**120.010**	**68,303,011**			

Sub-Station	November'15					December'15				
	Peak Demand(	Unit kWh(Purchase	Total KWh(sold)	Substatio n SL %	Load Factor	Peak Demand(	Unit kWh(Purchase)	Total KWh(sold)	Substatio n SL %	Load Factor
GENDA	7.5	4,437,903				6.5	3,783,763			
FULBARIA-1	7.800	5,829,450				7.200	5,082,000			
FULBARIA-2	0.000	-				-	-			
FAZLUL HAQUE	0.820	1,102,159				0.85	1,028,239			
JAHANGIR	9.500	4,576,000				9.2	4,337,391			
BISHMILE DESA	2.900	5,286,549				2.8	4,271,597			
RAJASHAN	10.800	5,416,100				9.500	5,301,740			
AMTRANET	0.9	281,215				0.9	216,425			
AMINBAZAR-1	6.500	3,185,112				5.500	5,466,890			
AMINBAZAR-2	6.400	2,879,250				5.200	0			
TANNERY-1	5.400	3,524,339				6.200	3,066,545			
TANNERY-2	4.500	1,560,345	**55,338,332**	**1.85**	**78.35**	3.500	1,395,593	**46,132,475**	**7.38**	**75.67**
DHAMRAI	9.500	4,866,345				9.000	4,237,695			
BSCIC DHAMRAI	6.500	3,811,500				5.750	3,588,750			
NAYARHAT RAD	1.200	511,890				1.200	520,050			
HYCINTH FEBRIC	1.000	231,000				1.000	247,500			
MOHISHASHI	6.200	2,243,760				5.700	2,066,820			
DAIRY FIRM	6.000	3,288,162				5.300	2,121,530			
RADIO SAVAR	1.020	149,757				1.020	111,525			
AMIN BAZAR	0.000	30,720				0.000	28,530			
DHAKA PBS-1	0	412,595				0	375,415			
POLICE TOWN	5.500	2,755,465				4.20	2,535,691			
SWISS QUALITY						0.90	26,318			
Total	**99.940**	**56,379,616**				**91.420**	**49,810,007**			

Sub-Station	January'16					February'16				
	Peak Demand(M	Unit kWh(Purchase	Total KWh(sold)	Substatio n SL %	Load Factor	Peak Demand(M	Unit kWh(Purchase)	Total KWh(sold)	Substatio n SL %	Load Factor
GENDA	6.8	3,755,000				8.000	4,050,000			
FULBARIA-1	12.000	5,170,000				14.000	5,351,500			
FULBARIA-2	0.000	-				-	-			
FAZLUL HAQUE	0.847	957,660				0.804	846,367			
JAHANGIR	11.500	4,085,470				12.700	4,474,260			
BISHMILE DESA	3.800	4,281,403				4.700	4,794,183			
RAJASHAN	12.000	5,065,410				12.500	5,098,440			
AMTRANET	0.4	231,082				0.4	240,460			
AMINBAZAR-1	6.500	5,429,820				7.500	6,009,300			
AMINBAZAR-2	5.5	-				6.5	0			
TANNERY-1	7.5	3,014,908				8.2	3,378,042			
TANNERY-2	3.5	1,374,918	**48,745,588**	**3.65**	**66.03**	4	1,268,639	**52,320,973**	**4.79**	**61.84**
DHAMRAI	10.5	4,587,000				12.75	5,354,085			
BSCIC DHAMRAI	6.5	3,836,250				8	4,285,696			
NAYARHAT RADI	1.2	518,400				1.2	492,663			
HYCINTH FEBRICS	1	239,250				1	202,125			
MOHISHASHI	5.5	2,822,570				8.5	3,763,000			
DAIRY FIRM	4.8	1,858,130				4.8	2,036,660			
RADIO SAVAR	1.02	109,744				1.02	145,883			
AMIN BAZAR	0	27,000				0	27,480			
DHAKA PBS-1	0	491,220				0	560,050			
POLICE TOWN	5.2	2,555,900				6.5	2,464,000			
SWISS QUALITY	0.35	181,610				0.35	111,924			
Total	**106.417**	**50,592,745**				**123.424**	**54,954,757**			

Sub-Station	March'16					April'16				
	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Load Factor	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Load Factor
GENDA	12	5,525,000				12.5	5,695,000			
FULBARIA-1	14.000	6,586,800				16.000	6,627,500			
FULBARIA-2	0.000	-				-	-			
FAZLUL HAQUE	0.849	1,195,301				0.86	937,736			
JAHANGIR	12.700	5,744,500				16.000	6,734,310			
BISHMILE DESA	4.700	6,103,426				8	7,236,119			
RAJASHAN	12.500	7,291,450				14.000	6,991,180			
AMTRANET	0.4	265,788				0.4	244,530			
AMINBAZAR-1	7.500	7,963,890				8.000	9,071,810			
AMINBAZAR-2	6.5	-				8	0			
TANNERY-1	8.2	4,046,112				8	3,811,963			
TANNERY-2	4	2,022,283				7	2,582,452			
DHAMRAI	12.75	6,568,980	**64,201,237**	**8.74**	**76.65**	16	7,306,200	**70,543,865**	**8.81**	**69.71**
BSCIC DHAMRAI	8	4,636,500				13	4,900,500			
NAYARHAT RADIO	1.2	511,693				1.2	559,213			
HYCINTH FEBRICS	1	202,125				1	177,375			
MOHISHASHI	8.5	3,984,000				10	4,473,000			
DAIRY FIRM	4.8	3,574,470				4.8	4,824,450			
RADIO SAVAR	1.02	159,032				1.02	141,560			
AMIN BAZAR	0	32,220				0	34,680			
DHAKA PBS-1	0	569,034				0	609,538			
POLICE TOWN	6.5	3,271,000				8	3,880,000			
SWISS QUALITY	0.350	96,772				0.35	518,925			
Total	**127.469**	**70,350,376**				**154.130**	**77,358,041**			

Sub-Station	May'16					June'16				
	Peak Demand(M	Unit kWh(Purchase)	Total KWh(sold)	Substatio n SL %	Load Factor	Peak Demand(	Unit kWh(Purchase	Total KWh(sold)	Substatio n SL %	Load Factor
GENDA	11.5	5,590,000				7	5,780,000			
FULBARIA-1	12.500	6,952,000				14.500	7,579,000			
FULBARIA-2	0.000	-				0.000	-			
FAZLUL HAQUE	0.836	847,811				0.824	886,999			
JAHANGIR	14.000	6,660,110				17.000	7,057,090			
BISHMILE DESA	8.500	7,306,304				7.500	7,130,476			
RAJASHAN	12.500	6,652,520				14.500	8,138,060			
AMTRANET	0.65	124,988				0.4	85,690			
AMINBAZAR-1	8.960	8,697,700				7.400	9,287,304			
AMINBAZAR-2	9.000	-				7.500	0			
TANNERY-1	6.500	3,382,775				8.500	3,625,788			
TANNERY-2	6.690	3,358,921				7.000	3,524,724			
DHAMRAI	15.000	6,581,190				16.000	7,419,555			
BSCIC DHAMRA	11.850	4,339,500	**68,938,830**	**9.10**	**67.98**	12.500	5,016,000	**74,790,566**	**10.97**	**74.50**
NAYARHAT RAI	1.600	561,963				1.100	521,923			
HYCINTH FEBRI	0.960	165,000				1.000	193,875			
MOHISHASHI	10.500	3,282,000				11.500	3,758,000			
DAIRY FIRM	4.800	5,110,740				4.500	5,475,389			
RADIO SAVAR	1.200	123,405				1.000	130,051			
AMIN BAZAR	0.000	33,720				0.000	34,800			
DHAKA PBS-1	0.000	489,006				0.000	495,726			
POLICE TOWN	8.300	4,135,000				8.400	4,588,000			
SWIS QUALITY	3.000	1,163,773				3.500	1,755,380			
ACME 10MVA S	3.600	103,043				2.500	571,588			
Base paper 05M	2.500	181,691				2.500	954,580			
total	**154.946**	**75,843,160**				**156.624**	**84,009,998**			

Sub-Station	July'16					Aug'16				
	Peak Demand(M	Unit kWh(Purchase)	Total KWh(sold)	Substatio n SL %	Load Factor	Peak Demand(	Unit kWh(Purchase	Total KWh(sold)	Substatio n SL %	Load Factor
GENDA	11	5,324,000				10.500	5,818,000			
FULBARIA-1	15.000	6,393,200				14.500	7,594,400			
FULBARIA-2	0.000	-				0.000	-			
FAZLUL HAQUE	0.834	919,091				0.850	1,058,640			
JAHANGIR	16.000	6,697,260				15.500	7,335,730			
BISHMILE DESA	7.000	7,094,553				7.500	7,998,982			
RAJASHAN	13.500	7,181,830				12.5	7,431,700			
AMTRANET	0.256	74,085				0.256	99,633			
AMINBAZAR-1	7.200	8,845,320				7.500	9,640,070			
AMINBAZAR-2	7.500	-				8.500	0			
TANNERY-1	7.500	3,021,000				7.800	3,724,000			
TANNERY-2	7.000	3,060,435				8.000	3,669,247			
DHAMRAI	15.500	6,955,575				15.000	7,696,095			
BSCIC DHAMRAI	10.500	4,569,400	**71,565,511**	**7.33**	**70.66**	12.000	5,665,846	**79,183,469**	**8.18**	**77.78**
NAYARHAT RADI	1.100	485,210				1.100	464,063			
HYCINTH FEBRIC	1.000	115,500				0.800	193,875			
MOHISHASHI	10.500	3,968,000				10.000	3,843,000			
DAIRY FIRM	4.200	5,208,311				6.000	5,762,870			
RADIO SAVAR	1.000	125,064				1.000	132,026			
AMIN BAZAR	0.000	34,200				0.000	35,160			
DHAKA PBS-1	0.000	516,896				0.000	498,402			
POLICE TOWN	7.500	3,867,000				7.000	4,539,000			
SWIS QUALITY	2.300	1,014,860				2.300	1,224,520			
ACME 10MVA SS	2.400	678,370				2.440	709,500			
Base paper 05MV	2.500	855,250				2.500	946,000			
AKH Fashion	0.500	218,928				0.452	160,573			
total	**151.790**	**77,223,338**				**153.998**	**86,241,332**			

Sub-Station	September'16					Oct'16				
	Peak Demand(M	Unit kWh(Purchase	Total KWh(sold)	Substatio n SL %	Load Factor	Peak Demand(	Unit kWh(Purchase)	Total KWh(sold)	Substatio n SL %	Load Factor
GENDA	11	5,198,000				11.000	5,742,660			
FULBARIA-1	14.000	6,197,400				14.000	7,375,500			
FULBARIA-2	0.000	-				0.000	-			
FAZLUL HAQUE	0.870	781,894				0.849	990,000			
JAHANGIR	15.400	6,708,380				15.400	6,971,120			
BISHMILE DESA	8.500	7,417,025				8.500	7,445,920			
RAJASHAN	12.400	6,653,350				12	7,335,320			
AMTRANET	0.256	58,410				0.256	68,695			
AMINBAZAR-1	7.600	9,292,580				7.000	9,484,530			
AMINBAZAR-2	8.600	-				8.600	0			
TANNERY-1	7.800	2,504,000				7.800	3,150,000			
TANNERY-2	8.500	3,062,454				8.000	4,272,714			
DHAMRAI	15.100	6,609,405				15.100	7,450,000			
BSCIC DHAMRA	12.100	6,069,144	**71,769,476**	**7.54**	**68.73**	11.000	5,568,750	**77,292,878**	**8.29**	**75.89**
NAYARHAT RAD	1.400	458,040				1.400	452,485			
HYCINTH FEBRIC	0.800	193,875				0.800	251,625			
MOHISHASHI	10.000	3,924,000				10.000	3,685,000			
DAIRY FIRM	6.500	5,079,950				6.500	5,471,240			
RADIO SAVAR	1.000	125,284				1.000	149,041			
AMIN BAZAR	0.000	33,300				0.000	34,650			
DHAKA PBS-1	0.000	503,434				0.000	484,481			
POLICE TOWN	7.100	3,774,000				7.100	4,503,000			
SWIS QUALITY	2.600	1,055,478				2.600	1,323,190			
ACME 10MVA S	2.400	896,500				2.400	946,000			
Base paper 05M	2.500	822,250				2.500	937,750			
AKH Fashion	0.440	203,500				0.448	187,000			
total	**156.866**	**77,621,653**				**154.253**	**84,280,671**			

Sub-Station	Nov'16					Dec'16				
	Peak Demand(	Unit kWh(Purchase	Total KWh(sold)	Substation SL %	Load Factor	Peak Demand(	Unit Wh(Purchase	Total KWh(sold)	Substation SL %	Load Factor
GENDA	10.5	4,202,000				0.904	3,625,160			
FULBARIA-1	14.000	6,187,500				14.000	5,494,500			
FULBARIA-2	0.000	-				0.000	-			
FAZLUL HAQUE	0.849	1,113,090				0.900	1,097,828			
JAHANGIR	15.400	5,004,900				15.400	4,197,100			
BISHMILE DESA	8.500	5,869,486				8.500	5,248,104			
RAJASHAN	12.000	5,293,796				12	4,513,000			
AMTRANET	0.256	55,165				0.256	67,017			
AMINBAZAR-1	7.000	6,743,220				7.000	5,686,780			
AMINBAZAR-2	8.600	-				8.600	0			
TANNERY-1	7.800	2,330,000				7.800	2,310,000			
TANNERY-2	8.000	3,762,180				8.000	3,106,281			
DHAMRAI	15.100	5,230,855				15.100	4,873,110			
BSCIC DHAMRAI	10.000	4,727,250				10.000	4,174,500			
NAYARHAT RADI	1.400	488,950	**64,449,960**	**2.11**	**59.71**	1.400	429,550	**55,024,134**	**6.35**	**56.70**
HYCINTH FEBRIC	0.800	247,500				0.800	198,000			
MOHISHASHI	10.000	2,621,000				10.000	2,502,000			
DAIRY FIRM	6.500	4,333,170				6.500	3,906,728			
RADIO SAVAR	1.000	140,805				1.000	135,100			
AMIN BAZAR	0.000	30,570				0.000	29,700			
DHAKA PBS-1	0.000	387,627				0.000	345,823			
POLICE TOWN	7.100	3,513,000				7.100	3,127,000			
SWIS QUALITY	2.600	1,383,443				2.600	1,224,245			
ACME 10MVA SS	2.400	667,700				2.400	635,305			
Base paper 05M	2.500	1,332,733				2.500	1,497,018			
AKH Fashion	0.448	157,135				0.409	139,095			
AKH ECO	0.386	14,369				0.386	167,131			
Incepta Pharma	0.000	-				0.380	27,500			
total	**153.139**	**65,837,444**				**143.935**	**58,757,575**			

Sub-Station	Jan'17					Feb'17				
	Peak Demand(M	Unit kWh(Purchase	Total KWh(sold)	Substation SL %	Load Factor	Peak Demand(	Unit kWh(Purchase	Total KWh(sold)	Substation SL %	Load Factor
GENDA	7.74	3,667,840				7.740	3,542,000			
FULBARIA-1	14.000	5,494,500				14.000	5,139,750			
FULBARIA-2	0.000	-				0.000	-			
FAZLUL HAQUE	3.730	1,181,812				3.730	1,000,024			
JAHANGIR	11.400	4,313,000				11.400	4,079,000			
BISHMILE DESA	8.500	5,288,895				8.500	5,035,793			
RAJASHAN	11.500	4,514,400				11.5	4,364,690			
AMTRANET	0.256	64,818				0.256	60,087			
AMINBAZAR-1	14.600	5,335,000				14.600	6,237,000			
AMINBAZAR-2	0.000	-				0.000	0			
TANNERY-1	6.800	2,555,000				6.800	1,835,700			
TANNERY-2	8.400	3,324,539				8.400	3,131,000			
DHAMRAI	15.150	5,213,010				15.150	5,610,000			
BSCIC DHAMRAI	10.500	4,191,000				10.500	4,158,000			
NAYARHAT RADI	1.400	429,550				1.400	430,100			
HYCINTH FEBRIC	0.800	170,734	**57,518,831**	**5.38**	**52.63**	0.800	141,034	**58,794,193**	**0.91**	**51.37**
MOHISHASHI	12.300	3,268,000				12.300	4,004,000			
DAIRY FIRM	11.500	3,829,100				11.500	3,724,745			
RADIO SAVAR	1.000	127,202				1.000	117,151			
AMIN BAZAR	0.000	27,180				0.000	27,180			
DHAKA PBS-1	0.000	448,040				0.000	518,191			
POLICE TOWN	7.100	3,271,000				7.100	3,085,000			
SWIS QUALITY	2.600	810,562				2.600	584,650			
ACME 10MVA SS	2.400	833,195				2.400	805,090			
Base paper 05M	4.000	1,375,192				4.000	463,678			
AKH Fashion	1.120	130,213				1.120	151,250			
AKH ECO	0.530	168,575				0.530	169,221			
Incepta Pharma	2.090	728,750				2.090	789,360			
M.A.H Spinning	0.600	18,728				0.600	114,428			
Bay Tannery 33K	0.400	12,238				0.400	17,352			
total	**160.416**	**60,792,073**				**160.416**	**59,335,474**			

Sub-Station	March'17					Apr'17				
	Peak Demand(	Unit kWh(Purchase)	Total KWh(sold)	Substatio n SL %	Load Factor	Peak Demand(	Unit Wh(Purchase	Total KWh(sold)	Substatio n SL %	Load Factor
GENDA	9.2	4,642,000				7.740	3,542,000			
FULBARIA-1	14.000	6,179,250				14.000	5,139,750			
FULBARIA-2	0.000	-				0.000	-			
FAZLUL HAQUE	3.470	1,234,984				3.730	1,000,024			
JAHANGIR	11.400	5,280,000				11.400	4,079,000			
BISHMILE DESA	8.500	6,229,596				8.500	5,035,793			
RAJASHAN	11.500	5,557,700				11.5	4,364,690			
AMTRANET	0.54	54,587				0.256	60,087			
AMINBAZAR-1	14.600	7,341,400				14.600	6,237,000			
AMINBAZAR-2	0.000	-				0.000	0			
TANNERY-1	6.800	1,482,648				6.800	1,835,700			
TANNERY-2	8.400	4,075,300				8.400	3,131,000			
DHAMRAI	15.150	6,517,500				15.150	5,610,000			
BSCIC DHAMRAI	10.500	4,636,500				10.500	4,158,000			
NAYARHAT RADIO	1.400	503,225				1.400	430,100			
HYCINTH FEBRICS	0.800	161,081	**68,707,186**	**5.10**	**58.56**	0.800	141,034	**58,794,193**	**0.91**	**51.37**
MOHISHASHI	12.300	4,197,000				12.300	4,004,000			
DAIRY FIRM	11.500	4,873,000				11.500	3,724,745			
RADIO SAVAR	0.407	135,614				1.000	117,151			
AMIN BAZAR	0.000	29,790				0.000	27,180			
DHAKA PBS-1	0.000	551,216				0.000	518,191			
POLICE TOWN	7.890	3,756,000				7.100	3,085,000			
SWIS QUALITY	3.940	924,742				2.600	584,650			
ACME 10MVA SS	2.400	1,034,990				2.400	805,090			
Base paper 05MV	4.000	421,080				4.000	463,678			
AKH Fashion	1.190	187,000				1.120	151,250			
AKH ECO	0.530	178,571				0.530	169,221			
Incepta Pharma 3	2.090	927,355				2.090	789,360			
M.A.H Spinning	0.600	592,295				0.600	114,428			
Bay Tannery 33KV	0.200	19,883				0.400	17,352			
Tanary-1(2nd Uni	8.400	678,909								
total	**171.707**	**72,403,216**				**160.416**	**59,335,474**			

Sub-Station	May'17					June'17				
	Peak Demand(	Unit Wh(Purchase	Total KWh(sold)	Substatio n SL %	Load Factor	Peak Demand(	Unit kWh(Purchase	Total KWh(sold)	Substatio n SL %	Load Factor
GENDA	9.2	6,248,850				9.2	5,594,125			
FULBARIA-1	14.000	7,799,550				14.000	7,369,725			
FULBARIA-2	0.000	-				0.000	-			
FAZLUL HAQUE	3.590	1,089,825				3.730	947,402			
JAHANGIR	11.400	7,447,680				12.400	6,992,930			
BISHMILE DESA	8.500	7,843,995				8.500	6,429,190			
RAJASHAN	11.500	7,355,774				11.500	7,190,771			
AMTRANET	0.6	58,328				0.6	81,840			
AMINBAZAR-1	14.600	10,022,870				14.600	9,383,880			
AMINBAZAR-2	0.000	-				0.000	-			
TANNERY-1	6.800	2,433,296				7.800	1,627,455			
TANNERY-2	8.400	6,410,321				15.400	6,561,887			
DHAMRAI	15.150	7,645,110				15.150	7,326,660			
BSCIC DHAMRAI	10.500	5,461,500				10.500	4,620,000			
NAYARHAT RADIO	1.400	646,633				1.400	571,395			
HYCINTH FEBRICS	0.800	222,008				0.800	161,246			
MOHISHASHI	12.300	4,185,000	**86,133,582**	**8.29**	**73.98**	12.300	4,394,940	**76,883,659**	**11.02**	**67.78**
DAIRY FIRM	11.500	6,872,800				11.500	6,349,200			
RADIO SAVAR	0.407	150,157				0.407	156,313			
AMIN BAZAR	0.000	31,530				0.000	28,290			
DHAKA PBS-1	0.000	425,956				0.000	458,216			
POLICE TOWN	8.770	4,593,000				8.770	3,797,000			
SWIS QUALITY	3.940	672,925				3.940	889,158			
ACME 10MVA SS	2.400	1,511,565				2.400	966,185			
Base paper 05MVA	4.000	1,511,758				4.000	1,159,042			
AKH Fashion	1.300	221,073				1.280	198,770			
AKH ECO	0.530	271,135				0.530	170,995			
Incepta Pharma 33	2.090	1,102,860				2.090	755,975			
M.A.H Spinning	0.700	786,830				0.700	583,055			
Bay Tannery 33KV	0.300	30,883				0.300	25,658			
Tanary-1(2nd Unit)	8.400	-				0.000	-			
Sadaepur 11kv	3.250	862,436				3.250	1,614,825			
total	**176.327**	**93,915,648**				**177.047**	**86,406,128**			

3. Monthly Revenue Data of DPBS-3

Customer Class	July'15					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	134530	0.28	8931	4.64	803,790	0.27
0-50	5994398	12.28	22304	11.60	20,803,402	7.03
0-75	10255297	21.00	20301	10.56	40,801,434	13.79
76-200	4792207	9.81	90497	47.05	25,847,602	8.74
201-300	4332342	8.87	30156	15.68	23,188,790	7.84
301-400	2738012	5.61	11713	6.09	15,161,200	5.12
401-600	1483141	3.04	6716	3.49	12,789,460	4.32
600++	880820	1.80	1713	0.89	8,790,733	2.97
Total	**30610747**	**62.69**	**192331**	**100%**	**148,186,411**	**50.09**
Commercial	4649117	9.52	17801		45,762,714	15.47
Charitable	445102	0.91	1783		2,288,515	0.77
Irrigation	331579	0.68	5603		1,349,087	0.46
General Power	1023579	2.10	2134		7,053,726	2.38
Large Power	10809637	22.14	440		84,103,279	28.43
33 KV	933625	1.91	3		6,908,650	2.34
Street Light	28106	0.06	57		199,383	0.07
Grand Total	**48,831,492**	**100%**	**220,152**		**295,851,765**	**100%**

Customer Class	August'15					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	118867	0.20	8283	4.21	745,470	0.20
0-50	7647194	12.71	23229	11.81	26,387,167	7.06
0-75	9375871	15.59	18059	9.18	37,268,191	9.97
76-200	4311962	7.17	82576	41.98	23,362,890	6.25
201-300	6924846	11.51	35268	17.93	36,733,481	9.83
301-400	3801341	6.32	16135	8.20	20,998,018	5.62
401-600	1961590	3.26	10229	5.20	16,933,541	4.53
600++	1476263	2.45	2912	1.48	14,732,197	3.94
Total	**35617934**	**59.22**	**196691**	**100%**	**177,160,955**	**47.42**
Commercial	5203979	8.65	18243		51,153,087	13.69
Charitable	511482	0.85	1813		2,617,658	0.70
Irrigation	361850	0.60	6757		1,486,694	0.40
General Power	2427289	4.04	2110		19,045,994	5.10
Large Power	14697668	24.44	447		112,415,909	30.09
33 KV	1298034	2.16	3		9,542,915	2.55
Street Light	28935	0.05	57		202,384	0.05
Grand Total	**60,147,171**	**100%**	**226,121**		**373,625,596**	**100%**

Customer Class	September'15					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	218538	0.39	8692	4.30	782,020	0.22
0-50	4850547	8.56	21058	10.42	17,204,553	4.88
0-75	9968254	17.59	18205	9.01	39,503,408	11.21
76-200	9022690	15.92	88279	43.69	47,293,712	13.42
201-300	5477417	8.00	35881	17.76	29,244,134	8.30
301-400	3094901	5.46	15704	7.77	17,140,353	4.86
401-600	1601802	2.83	11497	5.69	13,879,010	3.94
600++	846575	1.49	2719	1.35	8,476,010	2.40
Total	**35080724**	**61.90**	**202035**	**100%**	**173,523,200**	**49.22**
Commercial	5082371	8.97	17788		50,057,797	14.20
Charitable	527270	0.93	1929		2,709,731	0.77
Irrigation	258793	0.46	6204		1,174,322	0.33
General Power	2146424	3.79	2647		17,517,884	4.97
Large Power	12438107	21.95	765		98,794,320	28.03
33 KV	1111252	1.96	3		8,527,587	2.42
Street Light	30132	0.05	56		210,285	0.06
Grand Total	**56,675,073**	**100%**	**231,427**		**352,515,126**	**100%**

Customer Class	October'15					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	756431	1.28	9299	4.33	837,365	0.22
0-50	4787720	8.08	22951	10.69	16,915,514	4.44
0-75	9283783	15.66	23279	10.85	36,040,425	9.46
76-200	6736404	11.37	92936	43.30	37,053,517	9.73
201-300	6389841	10.78	37684	17.56	35,221,648	9.25
301-400	3241951	5.47	16984	7.91	18,766,784	4.93
401-600	1920815	3.24	9211	4.29	16,956,546	4.45
600++	982391	1.66	2276	1.06	9,870,207	2.59
Total	**34099336**	**57.54**	**214620**	**100%**	**171,662,006**	**45.07**
Commercial	5184562	8.75	19036		53,265,100	13.98
Charitable	470101	0.79	1977		2,640,528	0.69
Irrigation	331321	0.56	4524		1,437,354	0.38
General Power	2514197	4.24	2643		20,357,702	5.34
Large Power	15066042	25.42	790		119,162,272	31.28
33 KV	1571625	2.65	3		12,177,941	3.20
Street Light	29421	0.05	55		216,329	0.06
Grand Total	**59,266,605**	**100%**	**243,648**		**380,919,232**	**100%**

Customer Class	November'15					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	380965	0.76	12386	5.84	1,114,740	0.35
0-50	4153674	8.25	32449	15.31	15,019,060	4.69
0-75	9509365	18.89	23365	11.02	37,059,102	11.58
76-200	6788424	13.49	94775	44.72	37,053,734	11.58
201-300	4623421	9.18	29603	13.97	25,479,522	7.96
301-400	2772982	5.51	11458	5.41	15,898,234	4.97
401-600	1197684	2.38	6259	2.95	10,585,986	3.31
600++	552119	1.10	1648	0.78	5,562,193	1.74
Total	**29978634**	**59.55**	**211943**	**100%**	**147,772,571**	**46.19**
Commercial	4405954	8.75	19674		44,579,578	13.94
Charitable	416475	0.83	1978		2,251,052	0.70
Irrigation	170097	0.34	7162		864,387	0.27
General Power	2309725	4.59	2701		20,430,996	6.39
Large Power	11422849	22.69	485		91,572,313	28.63
33 KV	1604625	3.19	3		12,202,191	3.81
Street Light	31796	0.06	54		227,764	0.07
Grand Total	**50,340,155**	**100%**	**244,000**		**319,900,852**	**100%**

Customer Class	December'15					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	227782	0.54	21067	9.86	1,896,030	0.69
0-50	4703366	11.17	49801	23.31	17,392,525	6.37
0-75	8260158	19.62	34554	16.17	32,693,930	11.98
76-200	4321071	10.26	85250	39.90	24,414,245	8.95
201-300	2321534	5.51	15707	7.35	12,849,312	4.71
301-400	696317	1.65	4366	2.04	4,032,970	1.48
401-600	417577	0.99	2068	0.97	3,682,850	1.35
600++	231918	0.55	829	0.39	2,330,452	0.85
Total	**21179723**	**50.31**	**213642**	**100%**	**99,292,314**	**36.38**
Commercial	3801374	9.03	19750		38,699,536	14.18
Charitable	250428	0.59	2051		1,393,690	0.51
Irrigation	281617	0.67	4753		1,254,451	0.46
General Power	2501381	5.94	2745		20,410,754	7.48
Large Power	12550964	29.81	486		100,150,951	36.70
33 KV	1498750	3.56	4		11,493,418	4.21
Street Light	32276	0.08	54		231,206	0.08
Grand Total	**42,096,513**	**100%**	**243,485**		**272,926,320**	**100%**

Customer Class	January'16					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	183239	0.41	23128	10.55	2,081,520	0.70
0-50	5428113	12.06	54778	24.99	20,065,725	6.75
0-75	7418161	16.48	41729	19.04	29,613,612	9.97
76-200	3284315	7.29	83348	38.03	19,082,769	6.42
201-300	1701142	3.78	10700	4.88	9,505,486	3.20
301-400	447362	0.99	3276	1.49	2,611,543	0.88
401-600	323276	0.72	1421	0.65	2,882,721	0.97
600++	241852	0.54	805	0.37	2,427,928	0.82
Total	**19027460**	**42.26**	**219185**	**100%**	**88,271,304**	**29.71**
Commercial	4093115	9.09	20108		41,699,526	14.04
Charitable	237330	0.53	2070		1,330,451	0.45
Irrigation	1375723	3.06	3349		5,354,491	1.80
General Power	2830158	6.29	2836		22,953,843	7.73
Large Power	15800850	35.09	490		124,796,614	42.01
33 KV	1629375	3.62	4		12,430,019	4.18
Street Light	32091	0.07	53		229,879	0.08
Grand Total	**45,026,102**	**100%**	**248,095**		**297,066,127**	**100%**

Customer Class	February'16					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	186772	0.38	23928	10.76	2,153,520	0.68
0-50	5280678	10.82	56765	25.53	19,820,823	6.27
0-75	7477111	15.31	41073	18.48	29,769,622	9.42
76-200	3317583	6.80	84272	37.91	19,145,332	6.06
201-300	1930587	3.95	10552	4.75	10,628,456	3.36
301-400	558696	1.14	2947	1.33	3,235,663	1.02
401-600	294755	0.60	1929	0.87	2,614,169	0.83
600++	217868	0.45	839	0.38	2,201,673	0.70
Total	**19264050**	**39.46**	**222305**	**100%**	**89,569,258**	**28.34**
Commercial	4552186	9.32	20247		46,062,649	14.57
Charitable	245706	0.50	2062		1,373,008	0.43
Irrigation	3231045	6.62	3970		12,562,817	3.97
General Power	2950923	6.04	2848		23,862,213	7.55
Large Power	17192238	35.21	490		132,035,320	41.77
33 KV	1347500	2.76	4		10,334,255	3.27
Street Light	39624	0.08	53		283,891	0.09
Grand Total	**48,823,272**	**100%**	**251,979**		**316,083,411**	**100%**

Customer Class	March'16					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	288477	0.50	18666	8.44	1,679,940	0.45
0-50	4543064	7.82	43194	19.53	16,375,790	4.34
0-75	9649049	16.60	36653	16.57	37,931,446	10.06
76-200	5201855	8.95	92595	41.86	29,077,700	7.72
201-300	3422759	5.89	19988	9.04	18,841,878	5.00
301-400	1086483	1.87	6325	2.86	6,293,669	1.67
401-600	677069	1.16	3019	1.36	5,968,375	1.58
600++	328034	0.56	767	0.35	3,296,449	0.87
Total	**25196790**	**43.34**	**221207**	**100%**	**119,465,247**	**31.70**
Commercial	5339276	9.18	20439		53,713,758	14.25
Charitable	375141	0.65	2054		2,042,913	0.54
Irrigation	3070674	5.28	4520		11,901,595	3.16
General Power	3454755	5.94	2886		27,706,446	7.35
Large Power	18820447	32.38	478		147,754,123	39.20
33 KV	1836125	3.16	4		14,040,468	3.73
Street Light	37829	0.07	53		271,021	0.07
Grand Total	**58,131,037**	**100%**	**251,641**		**376,895,571**	**100%**

Customer Class	April'16					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	701273	1.10	15053	6.68	1,354,770	0.33
0-50	4925117	7.75	38219	16.97	17,661,923	4.34
0-75	10207697	16.06	29359	13.03	39,991,914	9.83
76-200	6560862	10.32	96968	43.05	36,065,536	8.86
201-300	4570290	7.19	29134	12.93	25,204,644	6.20
301-400	2422739	3.81	10207	4.53	13,899,816	3.42
401-600	1309044	2.06	5077	2.25	11,519,748	2.83
600++	722394	1.14	1218	0.54	7,242,237	1.78
Total	**31419416**	**49.45**	**225235**	**100%**	**152,940,588**	**37.59**
Commercial	5630553	8.86	20907		56,560,659	13.90
Charitable	478721	0.75	2047		2,579,452	0.63
Irrigation	2577528	4.06	3534		10,020,991	2.46
General Power	3435261	5.41	2907		27,585,416	6.78
Large Power	18005640	28.34	475		141,864,239	34.87
33 KV	1959375	3.08	4		15,016,839	3.69
Street Light	37401	0.06	53		267,521	0.07
Grand Total	**63,543,895**	**100%**	**255,162**		**406,835,705**	**100%**

Customer Class	May'16					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	1360373	2.19	10370	4.53	1,050,365	0.27
0-50	4313789	6.96	37072	16.21	15,421,131	3.91
0-75	10525026	16.97	41209	18.02	41,025,324	10.40
76-200	7070102	11.40	87132	38.09	38,518,624	9.76
201-300	6298160	10.15	30892	13.51	34,530,438	8.75
301-400	2858451	4.61	12549	5.49	16,406,804	4.16
401-600	1915813	3.09	7090	3.10	16,844,823	4.27
600++	1175460	1.90	2415	1.06	11,791,466	2.99
Total	**35517174**	**57.26**	**228729**	**100%**	**175,588,975**	**44.51**
Commercial	5532263	8.92	21306		55,612,607	14.10
Charitable	525059	0.85	2071		2,823,493	0.72
Irrigation	370086	0.60	3518		1,897,101	0.48
General Power	3000195	4.84	2929		24,268,110	6.15
Large Power	14505460	23.39	483		114,640,495	29.06
33 KV	2536290	4.09	6		19,381,192	4.91
Street Light	36809	0.06	53		263,207	0.07
Grand Total	**62,023,336**	**100%**	**259,095**		**394,475,180**	**100%**

Customer Class	June'16					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	2771438	0.42	173215	6.78	15,589,350	0.37
0-50	64965192	9.81	225990	8.84	234,500,880	5.55
0-75	113780247	17.18	394452	15.43	441,709,024	10.46
76-200	68632757	10.36	766485	29.98	365,556,286	8.65
201-300	52496231	7.92	344978	13.49	287,042,738	6.80
301-400	26273993	3.97	221033	8.65	151,287,236	3.58
401-600	14876079	2.25	180480	7.06	132,035,097	3.13
600++	8737920	1.32	249957	9.78	90,650,617	2.15
Total	**352533857**	**53.22**	**2556590**	**100%**	**1,718,371,228**	**40.68**
Commercial	59370298	8.96	236342		596,405,957	14.12
Charitable	4971746	0.75	23462		26,687,208	0.63
Irrigation	12510836	1.89	39349		50,005,882	1.18
General Power	31615518	4.77	31161		255,620,580	6.05
Large Power	179336589	27.07	5,585		1,409,276,678	33.36
33 KV	21678032	3.27	47		164,681,431	3.90
Street Light	399574	0.06	651		2,856,916	0.07
Grand Total	**662,416,450**	**100%**	**2,893,187**		**4,223,905,880**	**100%**

Customer Class	July'16					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	749162	1.16	11687	5.03	1,051,830	0.26
0-50	4044399	6.26	26178	11.27	14,896,236	3.65
0-75	11208160	17.33	35855	15.43	44,132,368	10.82
76-200	11698039	18.09	90054	38.76	63,223,875	15.50
201-300	6728536	10.41	36766	15.82	37,275,118	9.14
301-400	3190985	4.94	17421	7.50	18,525,481	4.54
401-600	1676296	2.59	11034	4.75	14,843,470	3.64
600++	786050	1.22	3343	1.44	7,927,829	1.94
Total	**40081627**	**61.99**	**232338**	**100%**	**201,876,207**	**49.50**
Commercial	5991976	9.27	21701		60,194,586	14.76
Charitable	594754	0.92	2108		3,194,159	0.78
Irrigation	276083	0.43	3131		1,221,904	0.30
General Power	2114979	3.27	2960		17,574,354	4.31
Large Power	11685314	18.07	487		94,059,064	23.06
33 KV	3875201	5.99	8		29,426,655	7.22
Street Light	38089	0.06	53		272,386	0.07
Grand Total	**64,658,023**	**100%**	**262,786**		**407,819,315**	**100%**

Customer Class	August'16					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	274173	0.38	12116	5.17	1,094,665	0.23
0-50	4009083	5.59	34988	14.93	14,743,244	3.13
0-75	12410633	17.31	41360	17.65	48,797,720	10.37
76-200	9756751	13.61	82865	35.36	52,398,010	11.14
201-300	4695110	6.55	29859	12.74	25,833,095	5.49
301-400	1905755	2.66	13028	5.56	10,989,146	2.34
401-600	1399969	1.95	14214	6.07	12,374,145	2.63
600++	402423	0.56	5917	2.52	4,107,602	0.87
Total	**34853897**	**48.62**	**234347**	**100%**	**170,337,627**	**36.20**
Commercial	6456699	9.01	21939		64,740,404	13.76
Charitable	515367	0.72	2119		2,779,663	0.59
Irrigation	249613	0.35	2996		1,123,649	0.24
General Power	3082073	4.30	2988		24,922,148	5.30
Large Power	22011080	30.70	500		172,331,746	36.63
33 KV	4486268	6.26	7		34,013,976	7.23
Street Light	37864	0.05	53		270,772	0.06
Grand Total	**71,692,861**	**100%**	**264,949**		**470,519,985**	**100%**

Customer Class	September'16					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	1791976	2.75	11128	4.70	1,001,845	0.24
0-50	4327555	6.65	28946	12.22	15,693,955	3.81
0-75	10362178	15.93	36812	15.54	40,607,766	9.85
76-200	9874876	15.18	99374	41.96	52,809,933	12.81
201-300	6037178	9.28	34522	14.58	33,672,809	8.17
301-400	2992570	4.60	15086	6.37	18,554,034	4.50
401-600	1988002	3.06	8616	3.64	18,992,867	4.61
600++	577673	0.89	2366	1.00	5,823,742	1.41
Total	**37952008**	**58.33**	**236850**	**100%**	**187,156,951**	**45.41**
Commercial	5871460	9.02	22202		59,056,222	14.33
Charitable	570098	0.88	2134		3,064,370	0.74
Irrigation	283917	0.44	2944		1,250,602	0.30
General Power	2327215	3.58	3024		19,143,540	4.64
Large Power	14340735	22.04	505		111,911,638	27.15
33 KV	3685088	5.66	7		30,294,982	7.35
Street Light	38069	0.06	54		272,256	0.07
Grand Total	**65,068,590**	**100%**	**267,720**		**412,150,561**	**100%**

Customer Class	October'16					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	2081984	2.97	11410	4.77	1,026,900	0.23
0-50	4102656	5.85	28005	11.70	14,876,234	3.31
0-75	10657655	15.19	39193	16.38	41,611,724	9.27
76-200	11043116	15.74	95486	39.90	59,973,781	13.35
201-300	4768855	6.80	36238	15.14	27,701,078	6.17
301-400	2974955	4.24	15705	6.56	17,495,127	3.90
401-600	2197929	3.13	9333	3.90	19,328,277	4.30
600++	989679	1.41	3933	1.64	9,954,966	2.22
Total	**38816829**	**55.34**	**239303**	**100%**	**191,968,087**	**42.74**
Commercial	5895234	8.40	22531		59,372,919	13.22
Charitable	539828	0.77	2152		2,908,501	0.65
Irrigation	362314	0.52	2906		1,542,824	0.34
General Power	2780846	3.96	3047		22,633,908	5.04
Large Power	16967154	24.19	522		134,491,438	29.95
33 KV	4741908	6.76	7		35,915,081	8.00
Street Light	39534	0.06	54		282,761	0.06
Grand Total	**70,143,647**	**100%**	**270,522**		**449,115,519**	**100%**

Customer Class	November'16					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	3168149	5.39	14074	5.84	1,266,660	0.34
0-50	3727067	6.34	28845	11.96	13,669,920	3.70
0-75	9522632	16.19	40246	16.69	37,619,787	10.19
76-200	8346943	14.20	97908	40.60	46,185,587	12.51
201-300	4568312	7.77	33896	14.06	26,567,527	7.20
301-400	2687936	4.57	14318	5.94	16,209,470	4.39
401-600	2919953	4.97	8268	3.43	25,581,566	6.93
600++	993624	1.69	3583	1.49	9,985,528	2.71
Total	**35934616**	**61.11**	**241138**	**100%**	**177,086,045**	**47.97**
Commercial	5147172	8.75	22960		51,991,078	14.08
Charitable	505981	0.86	2165		2,733,204	0.74
Irrigation	271514	0.46	2862		1,217,058	0.33
General Power	2250277	3.83	3072		18,277,589	4.95
Large Power	10155786	17.27	537		83,497,149	22.62
33 KV	4493185	7.64	8		34,039,836	9.22
Street Light	41349	0.07	54		295,770	0.08
Grand Total	**58,799,880**	**100%**	**272,796**		**369,137,729**	**100%**

Customer Class	December'16					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	286366	0.57	24561	10.06	2,210,490	0.67
0-50	6934262	13.91	49640	20.33	25,391,655	7.73
0-75	7442679	14.93	59105	24.20	30,572,685	9.30
76-200	4108000	8.24	81437	33.34	23,114,295	7.03
201-300	3159620	6.34	16483	6.75	17,341,863	5.28
301-400	647458	1.30	7534	3.08	3,790,204	1.15
401-600	368803	0.74	4000	1.64	3,317,571	1.01
600++	217907	0.44	1469	0.60	2,239,382	0.68
Total	**23165095**	**46.48**	**244229**	**100%**	**107,978,145**	**32.86**
Commercial	4611016	9.25	23365		46,898,637	14.27
Charitable	275636	0.55	2176		1,539,356	0.47
Irrigation	225161	0.45	2805		1,030,130	0.31
General Power	2449022	4.91	3065		20,056,740	6.10
Large Power	13900816	27.89	551		111,684,680	33.99
33 KV	5167469	10.37	8		39,116,303	11.90
Street Light	41359	0.08	54		295,846	0.09
Grand Total	**49,835,574**	**100%**	**276,253**		**328,599,837**	**100%**

Customer Class	January'17					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	251138	0.48	29514	11.95	2,656,260	0.75
0-50	5423034	10.35	57363	23.23	20,006,784	5.68
0-75	8119588	15.50	58167	23.55	32,450,884	9.21
76-200	3561384	6.80	77154	31.24	20,109,294	5.71
201-300	1973281	3.77	14225	5.76	11,036,271	3.13
301-400	474115	0.91	5692	2.30	2,811,777	0.80
401-600	249727	0.48	3490	1.41	2,251,760	0.64
600++	213825	0.41	1342	0.54	2,178,159	0.62
Total	**20266092**	**38.69**	**246947**	**100%**	**93,501,189**	**26.54**
Commercial	5086926	9.71	23637		51,686,657	14.67
Charitable	245481	0.47	2194		1,390,148	0.39
Irrigation	1523499	2.91	3289		5,925,075	1.68
General Power	2618024	5.00	3089		21,312,320	6.05
Large Power	16887417	32.24	562		134,614,133	38.20
33 KV	5712155	10.90	12		43,613,721	12.38
Street Light	43279	0.08	54		309,615	0.09
Grand Total	**52,382,873**	**100%**	**279,784**		**352,352,858**	**100%**

Customer Class	February'17					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	208650	0.43	28889	11.58	2,600,010	0.73
0-50	5314302	10.85	60511	24.25	20,131,325	5.66
0-75	9014371	18.40	56269	22.55	35,923,400	10.11
76-200	4007317	8.18	78578	31.49	22,674,229	6.38
201-300	1494961	3.05	15482	6.20	8,425,451	2.37
301-400	423765	0.87	5642	2.26	2,588,317	0.73
401-600	284911	0.58	3546	1.42	2,560,761	0.72
600++	181179	0.37	604	0.24	1,832,866	0.52
Total	**20929456**	**42.73**	**249521**	**100%**	**96,736,359**	**27.22**
Commercial	539669	1.10	23912		54,642,414	15.37
Charitable	267394	0.55	2215		1,501,538	0.42
Irrigation	3288189	6.71	3472		12,720,264	3.58
General Power	2722555	5.56	3118		22,128,099	6.23
Large Power	16732047	34.16	565		133,334,062	37.52
33 KV	4465015	9.11	11		34,051,120	9.58
Street Light	41524	0.08	52		296,907	0.08
Grand Total	**48,985,849**	**100%**	**282,866**		**355,410,763**	**100%**

Customer Class	March'17					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	215312	0.35	28072	11.15	2,526,480	0.60
0-50	5119288	8.21	52535	20.86	19,072,663	4.56
0-75	9724653	15.60	62565	24.85	38,988,911	9.32
76-200	4645690	7.45	79907	31.73	25,945,627	6.21
201-300	1723898	2.77	17309	6.87	9,818,393	2.35
301-400	529207	0.85	7146	2.84	3,330,555	0.80
401-600	263794	0.42	3589	1.43	2,381,253	0.57
600++	188249	0.30	679	0.27	1,946,925	0.47
Total	**22410091**	**35.95**	**251802**	**100%**	**104,010,807**	**24.87**
Commercial	5683237	9.12	24232		57,381,601	13.72
Charitable	322936	0.52	2240		1,790,244	0.43
Irrigation	2873252	4.61	3487		11,144,785	2.67
General Power	2947552	4.73	3152		23,950,627	5.73
Large Power	21623579	34.69	572		170,484,396	40.77
33 KV	6434932	10.32	11		49,088,806	11.74
Street Light	40009	0.06	53		286,040	0.07
Grand Total	**62,335,588**	**100%**	**285,549**		**418,137,306**	**100%**

Customer Class	April'17					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	150439	0.21	19892	7.82	1,790,280	0.38
0-50	4507760	6.40	39597	15.56	16,634,539	3.56
0-75	12659411	17.99	49431	19.43	49,822,062	10.67
76-200	7018874	9.97	101857	40.03	38,573,187	8.26
201-300	3315918	4.71	27587	10.84	18,358,640	3.93
301-400	1577532	2.24	9782	3.84	9,105,190	1.95
401-600	781289	1.11	5300	2.08	6,919,559	1.48
600++	296813	0.42	1002	0.39	3,002,634	0.64
Total	**30308036**	**43.06**	**254448**	**100%**	**144,206,091**	**30.88**
Commercial	6476823	9.20	24567		65,187,008	13.96
Charitable	41327	0.06	2258		2,560,162	0.55
Irrigation	2193731	3.12	3476		8,533,568	1.83
General Power	2993589	4.25	3207		24,266,818	5.20
Large Power	21655251	30.77	581		170,991,370	36.62
33 KV	6675617	9.48	11		50,896,021	10.90
Street Light	42606	0.06	53		278,992	0.06
Grand Total	**70,386,980**	**100%**	**288,601**		**466,920,030**	**100%**

Customer Class	May'17					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	252272	0.33	17185	6.69	1,546,650	0.30
0-50	5328650	6.89	37943	14.78	19,471,484	3.80
0-75	12935330	16.72	44990	17.52	51,017,244	9.95
76-200	8248621	10.66	102565	39.94	44,971,892	8.77
201-300	3870688	5.00	33431	13.02	21,533,823	4.20
301-400	2259629	2.92	12509	4.87	13,009,851	2.54
401-600	1240364	1.60	6703	2.61	10,945,167	2.13
600++	498112	0.64	1441	0.56	5,022,843	0.98
Total	**34633666**	**44.77**	**256767**	**100%**	**167,518,953**	**32.66**
Commercial	6717422	8.68	24778		67,550,168	13.17
Charitable	537153	0.69	2275		2,903,410	0.57
Irrigation	653252	0.84	3455		2,797,745	0.55
General Power	2970592	3.84	3227		24,112,411	4.70
Large Power	24098702	31.15	600		189,120,730	36.88
33 KV	7706550	9.96	11		58,585,275	11.42
Street Light	37351	0.05	53		266,659	0.05
Grand Total	**77,354,688**	**100%**	**291,166**		**512,855,351**	**100%**

Customer Class	June'17					
	Unit	%	Consumers	%	Revenue	%
Domestic						
Minimum	228650	0.33	13890	5.38	1,250,100	0.28
0-50	4558006	6.62	35717	13.83	16,835,410	3.77
0-75	13159444	19.10	44163	17.10	51,601,587	11.57
76-200	9627214	13.97	108768	42.11	52,219,385	11.71
201-300	5084553	7.38	33624	13.02	28,064,479	6.29
301-400	2180348	3.16	13024	5.04	12,572,549	2.82
401-600	1028369	1.49	7447	2.88	9,127,870	2.05
600++	407757	0.59	1638	0.63	4,126,520	0.93
Total	**36274341**	**52.66**	**258271**	**100%**	**175,797,900**	**39.42**
Commercial	6635864	9.63	24883		66,824,209	14.98
Charitable	530330	0.77	2290		2,869,004	0.64
Irrigation	257653	0.37	3298		1,103,326	0.25
General Power	2566394	3.73	3221		21,033,784	4.72
Large Power	16478777	23.92	608		131,495,255	29.48
33 KV	6109578	8.87	11		46,583,357	10.45
Street Light	37589	0.05	53		268,527	0.06
Grand Total	**68,890,526**	**100%**	**292,635**		**445,975,362**	**100%**