Study on Determination of Electricity Distribution Cost of Jamalpur PBS

A Thesis submitted in partial fulfillment of the requirements

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Bachelor of Science in Electrical and Electronics Engineering

Submitted By

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CERTIFICATION

This is to certify that this thesis entitled "**Study on Determination of Electricity Distribution Cost of JPBS"** 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.

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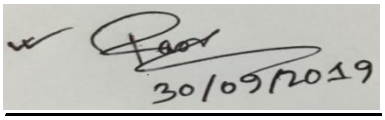

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DECLARATION

The thesis entitled "**Study on Determination of Electricity Distribution Cost JPBS"** submitted by **Name: Md. Al-Amin Islam Shabuj**, **ID No: 152-33-2622**, Session: Summer-2015 has been accepted as satisfactory in partial fulfillment of the requirements for the degree of **Bachelor of Science in Electrical and Electronic Engineering**.

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Dedicated to

My Parents And Teachers

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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
GDP	Gross Domestic Product
GOB	Government of Bangladesh
HE	Electrified Houses
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
OME	Operation & Maintenance Expenses
PBS	Palli Bidyut Samity
PDB	Power Development Board
PF	Power Factor
PGCB	Power Grid Company of Bangladesh
REB	Rural Electrification Board
REP	Rural Electrification Program
SL	System Loss
TC	Total Supply Cost
TR	Total Revenue

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Abstract

This thesis is on "**Study on Determination of Electricity Distribution Cost of JPBS**". Day-to-day challenges are becoming difficult to meet up the power crisis, especially in rural areas to meet up the power crisis. So, the government established the Rural Electrification Board (RRB) from the Bangladesh Development Board (BPDB) to meet up the rural electricity demand. This organization plays a significant role for the rural people. The purpose of this paper is to give a brief overview of REB and at the same time the socio-economic impact of REB reconsideration is emphasized. In my thesis, I have tried to study on whole power distribution scenario of Jamalpur Palli Bidyut Samity (PBS) for calculation of 2017-2018 fiscal years. A details study on primary data such as energy import, energy consumption, monthly consumer etc. has been discussed. This paper also demonstrated a details study on total distribution cost, distribution cost per unit, supply cost, supply cost per unit, total revenue per unit, energy purchase cost, system loss, surplus etc. The main goal of this thesis show that Jamalpur PBS is losable Palli Bidyut Samity (PBS).

Keywords: Rural Electrification, REP, BREB, PBS.

Chapter 1

BREB AND JAMALPUR PBS

1.1 Introduction

Being a developing country, the demand for electricity in Bangladesh has been increasing at a significantly high rate day by day. Since independence, Bangladesh has a number of reconstructs in the power sector, but these reconstructions failed to make specific improvements in the power sector. There are three main components of an electrical power system, including generation system, transmission system and distribution system. The power sector has the most important problem with the distribution system, which is characterized by heavy system loss and poor collection performance; however, the distribution system rarely gets the priority in reconstruction initiatives. Therefore, keeping the distribution system obsolete, it is very difficult to achieve the benefits of reconstruct. In order to make it efficient and effective, its administration must be reconstituted. At the same time, its performance should be monitored continually on the basis of particular performance indicators. In any power distribution system in Bangladesh, the system should not exceed 10% of the loss of system, such as the collection-import (CI) ratio should be exceeded 90%. At the recommended level to maintain the system loss and the CI ratio, fraudulent behavior by utility workers must be stopped quickly. This will help to achieve economic stability. Bangladesh government has taken various projects to meet this fast-growing demand.

1.2 BREB

Bangladesh Rural Electrification Board or BREB, is owned by government and run, corporation in Dhaka, Bangladesh and is responsible for rural electrification. It is the leading power distribution company in Bangladesh. Rural Electrification Board was founded on 29 October, 1977 and started functioning on 1 January, 1978. It applies electricity to rural areas and builds electric lines and sub stations in Bangladesh. Palli Bidyut Samities in a subsidiary of the board and works

as a consumer cooperative. The board has extended quickly to rural electric connections. It has accepted some market shares of solar energy.

Since origin, BREB puts forward the following major objectives in actualizing the rural electrification program.

- Ensure peoples participation in policy formulation in a democratic way.
- Provide reliable and sustainable electricity to the rural people at affordable price.
- Improve economic condition of the rural people by using electricity in agriculture, cottage and agro based industry.
- Improve living condition of rural peoples.
- Bring about entire rural Bangladesh under RE program or an area coverage basis.

Table 1.1: Rural Electrification Board at a Glance (as on July, 2018)

	Website	**www.reb.gov.bd**
1	Total PBSs	80 Nos.
2	Approved Projects	78 Nos.
3	District included in RE program	61 Nos.
4	Upazillas included in RE program	460 Nos.
5	100% Energized Upazillas	79 Nos.
6	Villages included in RE program	83,303 Nos.
7	Villages energized	74,926 Nos.
8	House Hold in Program Area	2,51,68,763 Nos.
9	Population in Program Area	10,68,93,673 Nos.
10	Line constructed	4,09,106 Km
11	Line energized	3,94,963 Km
12	Number of 33/11KV Sub-station & Capacity	867 Nos. & 10,075 MVA
13	System loss (80 PBSs)	11.43% (12 Month Avg), 15.43% (This Month)

14	Monthly Sales	Tk 1250 Crore
15	Bill collection	98.34%
16	Peak demand	6200 MW

17. Consumer (By category):

1) LT-A (Domestic)	2,09,93,260
2) LT-B (Irrigation)	2,18,993
3) LT-C1 (Small Industry)	1,57,422
4) LT-C2 (Construction)	569
5) LT-D1 (Charitable Institute)	2,92,340
6) LT-D2 (Street Light)	20,940
7) LT-E (Commercial)	14,76,179
8) LT-T (Temporary)	652
9) MT-1 (Domestic)	83
10) MT-2 (Commercial)	911
11) MT-3 (Industry)	11,799
12) MT-4 (Construction)	82
13) MT-5 (General)	370
14) MT-6 (Temporary)	67
15) HT-1 (General)	7
16) HT -2 (Commercial)	0
17) HT-3 (Industry)	277
18) HT-4 (Construction)	0
19) EHT-1 (General)	0
20) EHT-2 (General)	0
21) Solar	13,745
Total	**2,31,87,666**

Ref: MIS July, 2018 & Line Construction Report

1.3 Future plan

Bangladesh has a national grid for power generation capacity of 16848 MW in the utility power plant in July 2018. Energy sector of Bangladesh is booming. Recently, Bangladesh started construction of 2.4GHz (GW) Rooppur Nuclear Power Plant in the hope of going for operation in 2023. According to the Bangladesh Power Development Board in July 2018, 90 percent people have access to the electricity. But still the per capita energy consumption in Bangladesh is considered to be low.

The main source of power in the country's economic activity is electricity. In January of January 2017, Bangladesh had 15,351 megawatts of power (including captive power) in total power generation. By 2015, 92 percent of urban population and 67 percent of rural population have access to electricity for their source of light. There is an average of 77.9% of the population using electricity in Bangladesh. To maintain more than 7 percent economic growth by 2030, Bangladesh will need an estimated 34,000 megawatts of electricity.

Table 1.2: Future plan at a glance

Description	**1980-2008 (28 years)**	**2009- June,2016 (7 years)**	**Plan for 2021**
Consumer	74,00,000	82,00,000	2,30,00,000
Line (Km)	2,17,000	98,000	4,40,000
Sub-station (MVA)	4,650	3,296	15,000
Electricity Supply(MW)	2,025	4,388	9,200
System Loss	15.65%	12.48%	9%

1.4 Palli Bidyut Samity (PBS)

The REB program is managed by the local rural electric associations called Palli Bidyut Samity (PBS). The PBS concept is based on the Rural Electric Co-operatives model in the USA, which deals with cooperatives and consumers ownership. REB doesn't generate any electricity. They purchase electricity from the National Grid or selected IPPs at the 33KV voltage stage. They are responsible for their 78 PBS members and the electricity supply to the customer.

Function of Samity Board:

The Samity Board in addition to other duties and responsibilities as prescribed within these Bye-Laws performs or cause to perform the following functions: 1. Generate, produce, manufacture, purchase, acquire, accumulate and transmit electric power and energy, and to distribute, sell, supply and dispose of electric power and energy to the Samity members, to Governmental agencies and others; 2. Administer and guide the business and affairs of the Samity; 3. Formulate plans, adopt policies, promulgate rules and Bye-Laws for the management, operations and conduct of the business affairs of a Samity; 4. Fix retail rate charges for sale of electricity, subject to approval by the Rural Electrification Board; 5. On behalf of the Samity, execute agreements, contracts, deeds and other legal documents with the Power Development Board, Autonomous or Semi-autonomous bodies, any person, organization or other bodies as deemed necessary and expedient, unless such powers have been reserved by the Bye-Laws of the Samity which assigned or delegated such powers to any other person.

1.5 Jamalpur Palli Bidyut Samity

Since its beginning in 1987, Jamalpur Palli Bidyut Samity is playing an important role in Agricultural, Industrial and Socio-Economical development of Jamalpur District. The Rural Electrification Program led by Jamalpur Palli Bidyut Samity has acted a leap-forward in the development of the financial structure of rural regions in Jamalpur district as well as whole Bangladesh. In particular, the development of the jute industries playsan important role in the development of the livelihood of the people of Jamalpur District and the whole of Bangladesh, playing a leading role in the development of food, self-sufficiency in the fields of other large and small cottage industries and development of education, health and information technology through modern irrigation system. Women's employment and women's empowerment has been widespread, with the widespread employment of all the class people. It has a huge and continued effect on agricultural development, industrialization, business, and commercial functions in rural regions. It is a consumer possessed element sorted out on the fundamental standards of co-operative for distribution of electric power to its members and works on No Loss - No Profit reason for the common advantages of all its member.

Table 1.3: JPBS at a Glance (as on August 2018)

WEBSITE	pbs.jamalpur.gov.bd
DATE OF REGISTRATION	23/08/1984
DATE OF ENERGIZATION	14/02/1987
AREA	2606.00 Sq. Km
NO. OF UPAZILA	13
NO. OF UNION	81
NO. OF ENERGIZED UNION	76
NO. OF VILLAGE	2043
NO. OF ENERGIZED VILLAGE	1779
NO. OF ZONAL OFFICE	04
NO. OF SUB-ZONAL OFFICE	01
NO. OF AREA OFFICE	02
NO. OF COMPLAIN CENTRE	09
NO. OF CONTROL ROOM	16
NO. OF SUB-STATION (33/11 KV) Active	11
MAXIMUM DEMAND	70 MW
AMOUNT OF CONSTRUCTED LINE	7805.891 Km
AMOUNT OF ELECTRIFIED LINE	6300.722 Km
TOTAL CONSUMER CONNECTED (with service removals)	328649
CATEGORY WISE CONNECTIONS (i) DOMESTIC (ii) COMMERCIAL (iv) IRRIGATION (iii)CHARITABLE INSTITUTION (v) INDUSTRY (vi) STREET LIGHT (vii) SOLAR	 293901 15580 12191 4251 2550 153 23
BILL COLLECTION RATE (2017-2018)	81.12 (without rebate)
SYSTEM LOSS (2017-2018)	26.50%(as per Billing Meter)
AMOUNT INVESTED (CRORE TK)	426.57 Tk.

Now we can easily get information about get a new connection, billing and tariff rate or about PBS form the individual website of each PBS.

1.6 Objectives

Objectives of this research are discussed below:

1. Overall brief discussion: Overall brief discussion on electricity distribution cost determination of Jamalpur PBS will be discussed with proper recent information and data.

2. Study on data analysis: Study on data analysis of power distributions of Jamalpur PBS will be discussed. Proper and recent data from verified sources will be presented in chart and diagram.

3. Study on distribution losses and challenges: There will be a study on present distribution losses of JPBS. We will also discuss which challenges are making obstacle in the way of power development and there will a discussion on how we can solve our power related problems.

The main objective is that, we will learn about how to calculate month wise revenue data, cost calculation, import energy, sell energy, expenditure, distribution cost of energy according to the calculation of JPBS.

1.7 Research 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 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 develop to make more energy available at affordable prices to enable all people to use modern energy to meet their basic needs. To slow 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 Jamalpur PBS which is establish nearest my home town. I collected some primary data from Jamalpur PBS, BREB and BERC.

1.8 Thesis Outline

This Thesis is organized as follows:

Chapter 1 BREB and JPBS

Chapter 2 Literature Reviews

Chapter 3 Socio-economic Impact of REP in Bangladesh

Chapter 4 Import Energy of Jamalpur PBS

Chapter 5 Revenue and Consumers of JPBS

Chapter 6 Electricity Cost and Rate

Chapter 7 Conclusion

CHAPTER 2

LITERATURE REVIEWS

2.1 Literature Review

Electric power distribution system is essentially is the system that receives power from one or more points of power supply. The most familiar portion of electricity supply is distribution. Electric power distribution is the final stage of delivery electric power. It carries electricity from the transmission system to individual consumers. The first power distribution systems installed in European and US cities were used to supply lighting. Distribution substations connect to the transmission system. The lower the transmission voltage to medium voltage ranging. Commercial and residential customers are connected to the secondary distribution lines through service drops. Customers demanding a much larger amount of power may be connected directly to the primary distribution level or the sub transmission level.

Barry Hayes and Milan Prodanovic provided a survey of techniques for state estimation in electric power distribution systems. Although estimates of the state for decades has been applied for monitoring and control of power transmission, distribution grid to date it has not been widely applied[4].Sachidananda Prasad ; Dulla Mallesham Vinod Kumar presented that a bibliographical survey of different methods used for state estimation in electric power distribution network [5]. Gabriele D'Antona ; Carlo Muscas ; Sara Sulis, mentioned that the impact of economical and technological changes on electric distribution systems, such as market liberalization and increasing diffusion of nonlinear loads, creates new management, control and monitoring issues[6].C. Unsihuay ; O.R. Saavedra reported that transmission losses are a significant component of the amount of power to be generated in order to meet the power demand. Today, in competitive operating under pool-based, bilateral contracts or hybrid model, transmission losses must be allocated among the market participants. This process should take in account the buyer and seller spatial locations on the network as well as the non-linear interaction among simultaneous transactions in order to reflect the real market operation and adequate economic efficiencies [7].M.S. Alam, E.Kabir, M.M. Rahman and M.A.K. Chowdhury reported that no loss of system

loss should be exceeded by 10% of any power distribution system found in Bangladesh, such as the collection-import (CI) ratio should be kept above 90%. In order to maintain system loss and CI ratio, at the recommended level, utility workers should stop corruption quickly. This will help to achieve economic stability [8].Shahidur R. Khandker, Douglas F. Barnes and Hussain A. Samadpointed that Lack of access to electricity is one of the major impediments to growth and development of the rural economies in developing countries. That is why access to modern energy, in particular to electricity, has been one of the priority themes of the World Bank and other development organizations. Using a cross-sectional survey conducted in 2005 of some 20,000 households in rural Bangladesh, this paper studies the welfare impacts of households' grid connectivity [9].Mahedi Masuduzzaman tried to investigate the relationship between economic growth, electricity consumption and investment for Bangladesh through co-integration and causality analysis over the period 1981 to 2011 [10].

Yohanis, Mondol, Wright and Norton revealed that Domestic power consumption relies upon the area, structure and construction of a residency, and the detail of warming systems and their controls together with the proficiency of apparatuses and the attitude and socio-demographical characteristics of inhabitants [11]. They also pointed out that the electrical energy needs of the family can change each hour of every day, weekdays and weekends, and for various months of the year. Energy conservation measures are largely determined by income: a low-income consumer can invest only a small amount of money; where a high-income consumer is able to take long payback deadlines.

Navani, Sharma, Sapra reported that the world “distribution losses” refers to the difference between the quantity of energy delivered to the distribution system and the amount of energy customers is charged. They also designated that the losses on the total distribution 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 [12].

System are equivalent to non-technical losses as well as technical losses. Mentioned the causes for such high losses are; insufficiency of enough T & D capability, too many conversion levels, inappropriate load distribution and extended rural electrification etc.

We focus on a number of alternative reforms and recommendations for industry and household energy use policies. Losses are important as an environmental and economic cost related with them. In this study, a system or model has been developed based on the dynamic method of the system, which can provide more energy at affordable cost so that all people are able to use modern energy to fulfill their basic demands. Reduce overall growth of energy consumption through conservation and energy efficiency improvement and to make energy sources more environmentally sustainable.

Chapter 3

SOCIO-ECONOMIC IMPACT OF RURAL ELECTRIFICATION PROGRAM (REP) IN BANGLADESH

3.1 Background

Energy and environmental policies are being shaped at the national and international levels in response to a wide range of challenges. Rural Electrification Program (REP) in Bangladesh started its journey in 1978, primarily with the technical assistance of National Rural Electrification Cooperative Association (NRECA) of United States of America with an aim to provide the electricity outside the urban strata. The program is based on the concept of member-owned, Palli Bidyut Samity (PBS) similar to the rural electric cooperatives that exist in the United States. Seventy-eight PBSs have been organized to date in Bangladesh.

REP aimed initially at electrification of irrigation pumps and tube-wells, agro-based industries and serving domestic and commercial loads of only those villages, which fall right alongside the electrical distribution facilities built for irrigation purposes. To date, electricity made available through PBS areas, is intended to use for all possible applications that serve the purpose of improved living conditions of rural populace.

3.2 Impacts in Different Sector

3.2.1 Social and Economic Impact – Household Level

Extension of infrastructure in rural regions is essential for bringing any meaningful modification in the rural living patterns. Before our liberation in the year 1971, we had few facilities made for the rural citizenry. Almost, the government had few opportunities for elaboration 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 conveyed a feasibleness study for reaching electricity to each and every rural household and other rural organizations. As a result, the Rural Electrification Board was organized to take up efforts at bringing variations in rural living patterns.

Over the final 38 years, the program has touched approximately 433 thanas of the country, hence fixing it a core development program. The program has brought light to many families, so far remaining in perfect duskiness. It has afforded them the enlightenment towards innovative lining, freedom from poverty, malnutrition and hungriness. Electricity has brought many families near to the rural households. Some of them are thinking of leading new initiatives in industrial and farming sectors.

Rural Electrification is a multi-dimensional economic and social impacts at the household level; both are real and impossible; both are real and incomparable. The multifaceted impacts and benefits are either direct or indirect. In 2015, consume more than 65% of the electricity supply provided in the rural areas of the household. Most of the direct impact on the economy, and increased income, and employment, and cost optimized pattern, surpluses, savings, and wealth is reflected in the building. Most of the indirect impacts are related to the social and cultural aspects of life, including topics such as education, health, women's status, modernization, etc. among others. These direct and indirect benefits together bring economic growth, poverty reduction, and tolerance to human development.

3.2.2 Impact on Income Sector

Statistics Bureau of Bangladesh says the average monthly household income is approximately at Tk. 11,479 at the national level, Tk. 9,648 in the rural area and Tk. 16,475 in the urban area. The same was Tk. 7,203 at the national level, Tk. 6,095 in the rural area and Tk. 10,463 in the urban area. Average nominal income increased by 59.38 percent at the national level, 58.27 percent in the rural area and by 57.48 percent in the urban area. Real incomes increased by 15 percent at the national level, 13 percent in the rural areas and 14 percent in the urban areas. Such growth is indeed smallfor a period of five years and it primarily reflects significant under-reporting of income. The average annual income of households with electricity (HE) is more than that in the households of non-electrified villages. As compared to the non-electrified households, the electrified households show a higher income inequality but with higher income in the comparison groups. This means

the electrified households can be characterized as being relatively high-income inequality with relatively high income. This means that the relatively high income of the electricity family can be identified as relatively high-income discrimination.

3.2.3 Impact on Employment

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.

3.2.4 Impact on Education

Due to the expansion of mass education programs, the literacy rate in rural areas has enlarged considerably. Poor staffs can attend night schools at the end of the day's business. They can additionally sit beside the kids to supervise their studies. The living pattern in rural areas has modified because of the introduction of the latest client goods such as refrigerators, televisions, radios, cassette players, fans, etc. Villages are experiencing a form of urbanization within the form of civic amenities, regular education, sanitation, and health care and increased economic activities. By means of TV, people are currently keeping advised concerning the most recent state of sports, culture and political developments. Because the satellite has displayed the globe before the eyes, people get at home with the globe and this ensures their early socialization. The employment of girls has reduced and that they have a comfortable time to look at TV, hear radio and might assist children in their education. Literacy rate in electrified households (HHs) is 71%, where 54% in the un-electrified HHs.

3.2.5 Impact on generation dimension: Women's empowerment changing status and modernization effects

Rapid electrification of our rural housewives and other consumers has accelerated up the timely use of natural and other representations. Women enjoy electricity in rural regions. They can perform extra work after homework and can add to the household income. Women are self-reliant, producing small groups for income generation, particularly poultry and cattle, making plant farms and taking projects of sewing projects and sewing and opening small shops. Lighter use during the evening ensures a safe movement of women elsewhere. Power mobility, participation in income generation activities (IGA), decision making, freedom of income and savings, good utilization of loans, knowledge about gender discrimination problems, housework planning, change attitudes on

convenience, health care, reduction in discrimination, overall schooling for children and girls Growth, sending girls to school, legal matters Awareness (IE, 18-year-old daughters and 21-year-old boys) and awareness of the negative effects of dowry. In the power plants, women have adopted gender equality, such as participation in the decision making process, land / livestock / purchase / sale, home repair, marriage, health and education. Women spend more time watching TV than listening to radio and other programs in news and health-related programs. They are receiving more knowledge and thus are creating the effects of modernization. Among the 15 areas that are broadcasted through radio / TV, the quality of health (1), quality of education (2), quality of education of women (3), the usefulness of family planning (4), development of knowledge through development of the press (5), agricultural practice Improvements 6), Modern fishing knowledge (7), Pest management (8), Government knowledge Khaas land distribution (9), dowry prohibited (10), law on divorce (11), legal tools against women abuse (12), local government issues (13), women's rights (14) and human rights issues (15).

3.2.6 Impaction Direct Users of Domestic Electricity: Problems of Supply Interruptions

Changes in habits mediated through electricity have taken place. The best change in habit and leisure activities have a direct positive impact on improving the quality of life and changing the outlook of people towards a better life. Prime power should be adjusted, should be adjusted regularly at 6-10 and irregular supply of the summer season should be conducted to attempt to resolve the problem for all damages. This can be identified as electricity-driven demand creation for an improved standard of living. Irregularity of power supply and load shedding are serious problems in REP. In the summer most of the time, irregular electricity is supplied and 6-10 PM is the most irregular supply time. These results are enough to increase the question of supply of power quality through REP in the PBSs. The policy implications are straight forward: ensuring the regularity of electricity (or reducing the frequency of irregularities); power supply during the prime time, should be adjusted regularly at 6-10 and irregular supply of the summer season should be conducted to attempt to resolve the problem for all damages. Perhaps more likely to be the most important way to solve the problem of generating electricity due to population growth and increasing the electricity demand in rural households.

3.2.7 Impact on industrial development

The industry is the second most noteworthy consumer of rural electricity utilizing 42.3% of the absolute MWH. During the most recent twenty years, the all-out number of the industrial consumer of rural electricity has expanded 3210 times and the average number of industrial connections per PBS has expanded 550 times. Considerable development in industrial output (both as far as volume and value) has been recognized in the investigation. During the last five years, the development in value was about 295% in charged businesses. The absolute volume of output (as far as the ton) has expanded by 78%, while a similar development was just 8% in non-energized industry. The volume of output regarding piece unit (other than ton and mound) grew up by 121% in charged family units, and it was – 0.44% (negative) in non-energized enterprises during the last five years.

3.2.8 Impact on local governance and democratization

PBS individuals choose the Board of Directors by direct casting a ballot which makes a chance to build an informal community among the clients and to have command over the systems that permit their voices at the PBS management level. Since power made a friendly environment for political and get-together, network and patio meeting, individuals spend a more extended period in association gathering, clubs, cooperatives, and sanities" and strongly take an interest in neighborhood-level basic leadership. Less than one-third of the PBS members (29.6%) were found to know the qualification criteria to be a Director, about one-fourth (23.9%) of the PBS members reported to attend the last AGM and majority of the PBS members (65%) never cast their vote. Referenced purposes behind not taking an interest in PBS election were – the distance of PBS election centers from the home, lack of time and transport fare and so on. The larger part of the PBS members (60.3%) appeared to be uninformed about the roles of the elected directors in PBS management.

3.2.9 Impact on irrigation and agricultural production

In agriculture, Rural Electricity Program (REP) improves food self-sufficiency using significant productive and effective irrigation equipment's. The intensity of the use of electricity and the supply pumps (DTW/STW/LLP), both higher than diesel. Under the power supply pump, the average revenue per acre is more than 24% higher than diesel. Power supply pumps contribute one-third of the food self-sufficiency in Bangladesh. Through its Electrified Irrigation Pump, the REP covers the 4.1 million acres of land for the HVV Boro and Aman. RRP produces 6.43 million

tons of HVV boro and aman, which is about 29% of all types of rice produced in Bangladesh. 20% discount of electricity bill in irrigation pumps approved by the government, encourages farmers to increase the agricultural evolution. As a result, agricultural productivity have increased, availability of rice & other food items in villages has helped rural people keep up better food habits.

3.2.10 Social Impact of 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.

3.3 Summary

Rural electrification has positive impacts in both social and economic sectors. Rural electrified industries have been playing an important role in transforming the living condition of the rural people, whose fortune was tied up with subsistence agriculture until the coming of rural electrification. 90% of rural areas in Bangladesh can develop rural electrification technologies, as well as the development of the country.

CHPATER 4

IMPORT ENERGY OF JAMALPUR PBS

4.1 Introduction

The demand of electricity is increasing day by day. Crisis of power is one of the major problems in Bangladesh. For economic emancipation and in order to meet the consumer demands, the electricity growth that is generating more electricity, building more transmission/ distribution capacity, bringing more area/ population under electricity coverage and ensuring more efficient management of these are the essential issues. The Government of Bangladesh (GOB) has decided to build power plants in private sectors and Independent Power Producers (IPPs) launched their business in Bangladesh. According to the power sector growth in the country, the JPBS import 19.599 to 31.501MKWh power each month to meet the growing demands of the consumers and average import per month 25.55MKWh for the year of 2017-2018. In this chapter brief the history of the JPBS, their energy import scenarios are discussed.

4.2 JPBS Imports from BPDB

JPBS imports electricity only from government sector to meet their consumer demand, JPBS imports electricity from two Public sectors i.e. PDB Jamalpur C/G PBS HQ. Grid under PDB. JPBS does not import energy from any others to provide electricity to the different level of consumers. In this chapter we discuss about Energy Purchase and purchase cost from Public and private sector for three years (2017-2018, 2016-2017 & 2015-2016), also explain about different grid capacity, supply and peak demand, system loss, KWh sold to the consumers.

4.3 Data Analysis

Table 4.1.1: Energy Import of JPBS, 2017-18

Import point	July'17			August'17		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	5,111,016	21,759,230	20.68	6,588,264	21,820,527	**21.86**
Jamalpur(Shari)	4,125,772			4,030,951		
Jamalpur(MI&M)	11,496,731			11,548,548		
Sherpur(Boxi)	6,697,071			5,757,298		
Total	**27,430,590**			**27,925,061**		

Import point	September'17			October'17		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	4,849,865	23,926,131	13.14	5,128,320	21,450,758	**10.69**
Jamalpur(Shari)	4,144,270			3,355,678		
Jamalpur(MI&M)	10,940,832			9,786,884		
Sherpur(Boxi)	7,609,270			5,747,309		
Total	**27,544,237**			**24,018,191**		

Import point	Noverber'17			December'17		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	4,863,360	18,345,339	6.40	4,883,520	16,896,306	**14.38**
Jamalpur(Shari)	2,633,315			2,626,974		
Jamalpur(MI&M)	8,049,641			8,281,656		
Sherpur(Boxi)	4,053,249			3,941,853		
Total	**19,599,565**			**19,734,003**		

Import point	January'18			February'18		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	5,915,760	18,858,787	18.50	6,213,965	21,136,443	**14.32**
Jamalpur(Shari)	3,379,372			3,803,726		
Jamalpur(MI&M)	9,571,464			10,183,320		
Sherpur(Boxi)	4,272,666			4,467,186		
Total	**23,139,262**			**24,668,197**		

Import point	March'18			April'18		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	7,255,867	22,338,001	20.10	5,639,646	19,762,186	**18.47**
Jamalpur(Shari)	4,273,171			3,509,209		
Jamalpur(MI&M)	11,574,265			10,471,608		
Sherpur(Boxi)	4,855,644			4,619,365		
Total	**27,958,947**			**24,239,828**		

Import point	May'18			June'18		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	5,411,280	17,272,025	24.19	6,599,760	20,122,391	**36.12**
Jamalpur(Shari)	3,037,506			5,028,331		
Jamalpur(MI&M)	9,667,768			12,425,256		
Sherpur(Boxi)	4,666,755			7,447,814		
Total	**22,783,309**			**31,501,161**		

From the above table, in July 2017, JPBS import 27430590 KWh units, where 5111016 units from Jamalpur (PBS) grid, 4125772 units from Jamalpur (Shari) grid, 11496731 units from Jamalpur (MI & M) grid, 6697071 units from Sherpur (Baxi) grid. As per statistics both grids provide electricity to JPBS. In February 2018, JPBS import 23139262 units where 5915760 units from PDB Jamalpur C/G PBS HQ, 3379372 units from Jamalpur (Shari), 9571464 units from Jamalpur (MI & M), 4272666 units from Sherpur (Baxi).

The rest of the month energy import analysis showed in the Table: 4.2.1. 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. In June 2018, the energy import is 31501161 units, which is high import from previous months and system loss is also comparatively high and it's an effect of summer season because in the summer, energy consumption of different consumer is high, especially for domestic side. Same as at August, 2017 the energy import is 27925061 units which is also quite high.

On the other hand, the energy imports for the month of November, December are low to compare as other months of the year. It is seasonal effect of winter when the domestic consumer consumes lower amount of electricity and same as some industries are consume lower amount of energy as

per demand of production. In November 2017, the energy import is 19599565 units, which is lower import than the previous. In December 2017, the energy import is 19734003 units, which is higher from previous month. The system loss is not quite same. In November 2017, the system loss is 6.40%, which is lowest from the others month of the year but in December 2017, the system loss is higher. Again the energy import demand is high for the month of March, April, May and June 2018. For June 2018, energy import is 31,501,161units which is the highest amount of import for the year and the system loss is 36.12%, which is comparatively highest of the year. As per statistics, only grid provides electricity to JPBS. We present energy import scenario in this chapter by showing graphical figure.

Table 4.1.2: Energy Import of JPBS, 2016-17

Import point	July'16			August'16		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	6,344,640	18,840,820	19.92	5,766,720	18,417,426	**8.58**
Jamalpur(Shari)	3,280,773			2,885,251		
Jamalpur(MI&M)	9,962,853			8,199,140		
Sherpur(Boxi)	3,938,294			3,294,841		
Total	**23,526,560**			**20,145,952**		

Import point	September'16			October'16		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	5,790,960	17,973,586	15.09	5,079,840	17,512,233	**12.96**
Jamalpur(Shari)	3,131,885			2,899,066		
Jamalpur(MI&M)	8,693,963			8,735,861		
Sherpur(Boxi)	3,551,505			3,405,564		
Total	**21,168,313**			**20,120,331**		

Import point	November'16			December'16		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	4,603,440	16,572,247	6.01	4,798,080	15,183,097	**15.31**
Jamalpur(Shari)	2,320,159			2,462,480		
Jamalpur(MI&M)	7,377,077			7,252,020		
Sherpur(Boxi)	3,330,382			3,416,227		
Total	**17,631,058**			**17,928,807**		

Import point	January'17			February'17		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	5,821,920	18,485,527	14.11	5,659,200	19,102,994	**11.31**
Jamalpur(Shari)	3,324,074			3,321,112		
Jamalpur(MI&M)	8,838,756			8,801,100		
Sherpur(Boxi)	3,537,054			3,758,214		
Total	**21,521,804**			**21,539,626**		

Import point	March'17			April'17		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	6,430,320	21,759,230	9.75	5,022,848	16,778,228	**16.33**
Jamalpur(Shari)	3,852,333			2,992,324		
Jamalpur(MI&M)	9,948,852			8,757,540		
Sherpur(Boxi)	3,879,115			3,279,004		
Total	**24,110,620**			**20,051,716**		

Import point	May'17			June'17		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	4,978,560	14,880,345	21.62	3,207,120	17,622,047	**29.75**
Jamalpur(Shari)	2,856,823			3,637,212		
Jamalpur(MI&M)	8,332,236			10,779,300		
Sherpur(Boxi)	2,817,989			7,460,534		
Total	**18,985,608**			**25,084,166**		

From the above table, in July 2016, JPBS import 23526560 KWh units, where 6344640units from Jamalpur (PBS) grid, 3280773 units from Jamalpur (Shari) grid, 9962853 units from Jamalpur (MI & M) grid, 3938294 units from Sherpur (Baxi) grid. As per statistics both grids provide electricity to JPBS. In February 2017, JPBS import 23139262 units where 5659200 units from PDB Jamalpur (PBS), 3321112 units from Jamalpur (Shari), 8801100 units from Jamalpur (MI & M), 3758214 units from Sherpur (Baxi).

The rest of the month energy import analysis showed in the Table: 4.2.2. 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. In June 2017, the energy import is 25084166 units, which is high import from previous months and system loss is also comparatively high and it's an effect of summer season because in the summer, energy consumption of different consumer is high, especially for domestic side. Same as at August, 2017 the energy import is 24,110,620units which is also quite high.

On the other hand, the energy import for the month of November, December 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. In November 2016, the energy import is 17,631,058 units, which is lower import than the previous. In December 2016, the energy import is 17,928,807unit, which is higher from previous month. The system loss is not quite same. In November 2016, the system loss is 6.01%, which is lowest from the others month of the year but in December 2016, the system loss is higher. Again the energy import demand is high for the month of January, February, March and June 2017. For June 2017, energy import is 25084166units which is the highest amount of import for the year and the system loss is 29.75%, which is comparatively highest of the year. As per statistics, only grid provides electricity to JPBS.

Table 4.1.3: Energy Import of JPBS, 2015-16

Import point	July'15			August'15		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	4,101,600	15,190,538	24.98	3,943,680	16,818,302	**15.89**
Sharishabari	3,057,613			3,027,953		
Melandha&	10,008,996			9,923,904		
Boshigong	3,079,408			3,099,678		
Total	**20,247,617**			**19,995,215**		

Import point	September'15			October'15		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	3,828,240	16,449,584	17.92	4,873,680	17,165,091	**7.80**
Sharishabari	2,978,779			2,562,316		
Melandha&	10,049,292			8,205,984		
Boshigong	3,185,250			2,974,374		
Total	**20,041,561**			**18,616,354**		

Import point	November'15			December'15		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	3,689,520	13,836,431	6.53	4,175,760	13,026,092	**15.43**
Sharishabari	2,078,002			2,127,444		
Melandha&	6,349,104			6,312,504		
Boshigong	2,685,940			2,786,241		
Total	**14,802,566**			**15,401,949**		

Import point	January'16			February'16		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	5,011,680	15,855,483	15.76	5,801,040	18,959,585	**11.07**
Sharishabari	2,997,404			3,435,747		
Jamalpur(MI&M)	7,887,357			8,792,496		
Jamalpur(Bashi)	2,924,369			3,291,160		
Total	**18,820,810**			**21,320,443**		

Import point	March'16			April'16		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	6,367,680	19,283,140	15.83	5,744,400	17,309,041	**19.74**
Jamalpur(Shari)	3,654,690			3,554,078		
Jamalpur(MI&M)	9,612,864			9,174,996		
Jamalpur(Bashi)	3,275,032			3,092,842		
Total	**22,910,266**			**21,566,316**		

Import point	May'16			June'16		
	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur(PBS)	4,833,120	14,313,877	20.03	5,554,080	15,940,792	**21.92**
Jamalpur(Shari)	2,337,344			2,894,944		
Jamalpur(MI&M)	7,827,624			8,578,634		
Jamalpur(Bashi)	2,901,413			3,388,506		
Total	**17,899,501**			**20,416,164**		

From the above table, in July 2015, JPBS import 20,247,617KWh units, where 4101600units from Jamalpur (PBS) grid, 3057613 units from Jamalpur (Shari) grid, 10008996 units from Jamalpur (MI & M) grid, 3079408 units from Sherpur (Baxi) grid. As per statistics both grids provide

electricity to JPBS. In February 2016, JPBS import 21320443 units where 5801040 units from PDB Jamalpur (PBS), 3435747 units from Jamalpur (Shari), 8792496 units from Jamalpur (MI & M), 3291160 units from Sherpur (Baxi).

The rest of the month energy import analysis showed in the Table: 4.2.3. The demand of the electricity varies with different season in Bangladesh, like as winter, summer, and rainy season. I try to show relevant analysis for winter and summer seasons. In March 2016, the energy import is 22,910,266 units, which is high import from previous months and it's an effect of summer season because in the summer, energy consumption of different consumer is high, especially for domestic side. Same as at April, 2016 the energy import is 21566316units which is also quite high.

On the other hand, the energy import for the month of November, December 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. In November 2015, the energy import is 14802566 units, which is lower import than the previous. In December 2015, the energy import is 15401949unit, which is higher from previous month. The system loss is not quite same. In November 2015, the system loss is 6.53%, which is lowest from the others month of the year but in December 2015, the system loss is higher. Again the energy import demand is high for the month of February, March and April 2016. For March 2016, energy import is 22910266units which is the highest amount of import for the year and for July 2015, the system loss is 24.98%, which is comparatively highest of the year. As per statistics, only grid provides electricity to JPBS.

4.4 Graphical Analysis

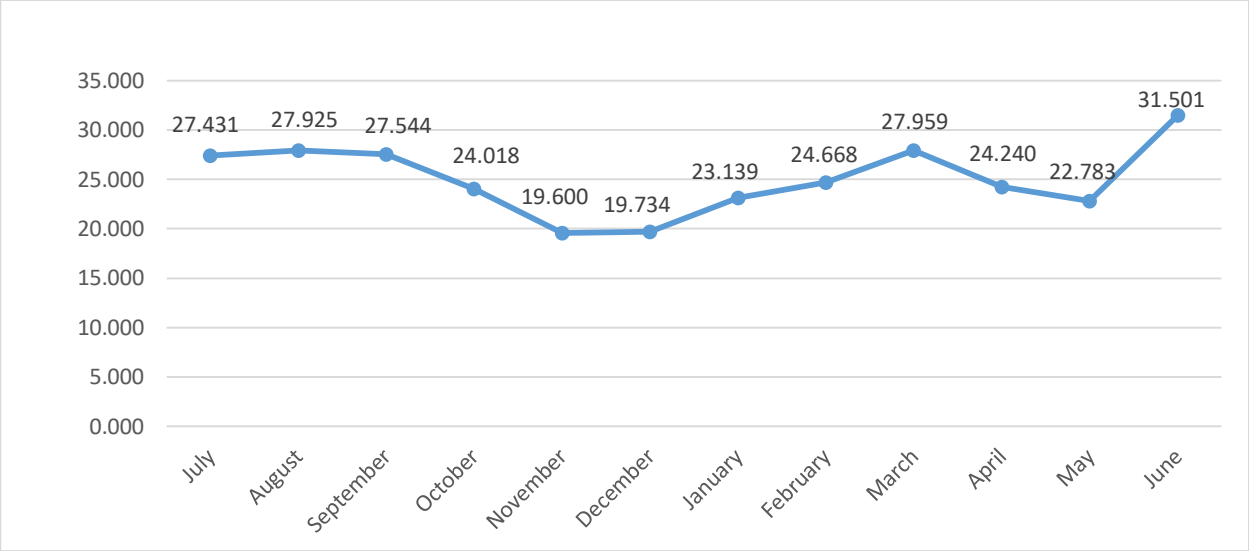


Fig 4.1.1: Month wise Energy Import (MU) of JPBS, 2017-2018

The line graph shows estimated month wise energy import (MU) of JPBS, 2017-2018. From the line graph, the high energy import is in July, August, September 2017 and March, June 2018. The lowest point during the period shown here is in November, December 2017 and January, May 2018. Overall the graph shows that the energy imports and supply to the consumer may vary season to season.

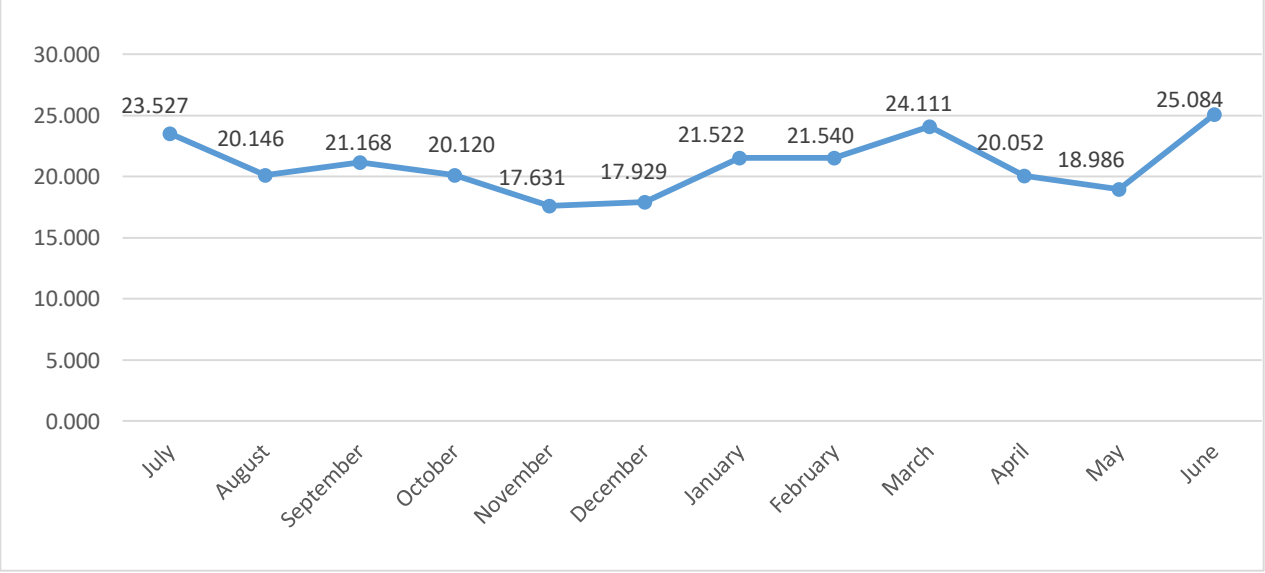


Fig 4.1.2: Month wise Energy Import (MU) of JPBS, 2016-2017

The line graph shows estimated month wise energy import (MU) of JPBS, 2016-2017. From the line graph, the high energy import is in July, 2016 and March, June 2017. The lowest point during the period shown here is in November, December 2016 and May 2017. Overall the graph shows that the energy imports and supply to the consumer may vary season to season.

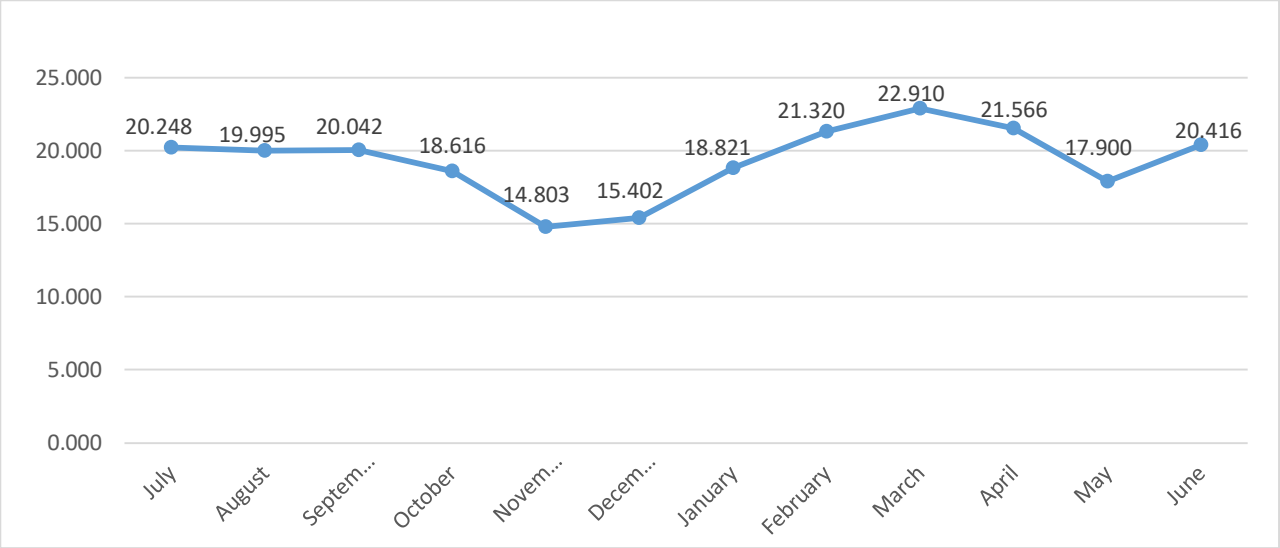


Fig 4.1.3: Month wise Energy Import (MU) of JPBS, 2015-2016

The line graph shows estimated month wise energy import (MU) of JPBS, 2015-2016. From the line graph, the high energy import is in February, March, and April, 2016. The lowest point during the period shown here is in November, December 2015 and May 2016. Overall the graph shows that the energy imports and supply to the consumer may vary season to season.

To control the load needs by proper load management, it can be possible to encourage Independent Power Producers (IPPs) and reduce transmission loss. Considering the inclusion of IPP and Local Government (GOV), the Central Government should take the initiative to develop skilled manpower for the power sector, to increase power generation and to ensure the proper use of Bangladesh, Central GOV can take responsibility.

4.5 Substations of JPBS

There are 12 substations under JPBS 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.

JPBS all substation names listed below-

1. Jamalpur H/Q-1 (P-1)
2. Jamalpur H/Q-1 (P-2)
3. Jamalpur H/Q-2 (NP)
4. Nurundi
5. Tarakandi
6. Sharishabari
7. Malandha
8. Baxigonj
9. Islampur
10. Mathergonj
11. Dawangonj-2
12. Dawangonj-1

4.6 System Losses

Table 4.2.1: System Loss of JPBS in 2017-18

Month	Grid Wise Import (MKWh)	Substation Wise Import (MKWh)	Unit Sold at Consumer End (MKWh)	Total System Loss (MKWh)	Sub-station System Loss (MKWh)	Grid to 33 KV Line Loss (MKWh)
July	27.431	24.946	21.759	5.672	3.187	2.485
August	27.925	26.093	21.821	6.104	4.272	1.832
September	27.544	25.975	23.926	3.618	2.049	1.569
October	24.018	22.456	21.451	2.567	1.005	1.562
November	19.560	18.405	18.345	1.215	0.060	1.155
December	19.734	18.821	16.896	2.838	1.925	0.913
January	23.139	22.464	18.859	4.280	3.605	0.675
February	24.668	23.159	21.136	3.532	2.023	1.509
March	27.959	26.313	22.338	5.621	3.975	1.646
April	24.24	22.646	19.762	4.478	2.884	1.594
May	22.783	21.142	17.272	5.511	3.87	1.641
June	31.501	29.502	20.122	11.379	9.38	1.999

In Table 4.2.1, Total System Loss= Grid to sold energy at Consumer end,

Sub-station System Loss= Substation to Sold energy at Consumer end,

33 KV Line Loss= Energy loss between Grid and Sub-station.

As we found from the Table 4.2.1, 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 huge. Where form October, 2017 to January, 2018; during winter season, system losses were below than 5 MKWh. In July 2017 and June 2018; both of these in summer, we found the total system loss about 3 times higher than winter.

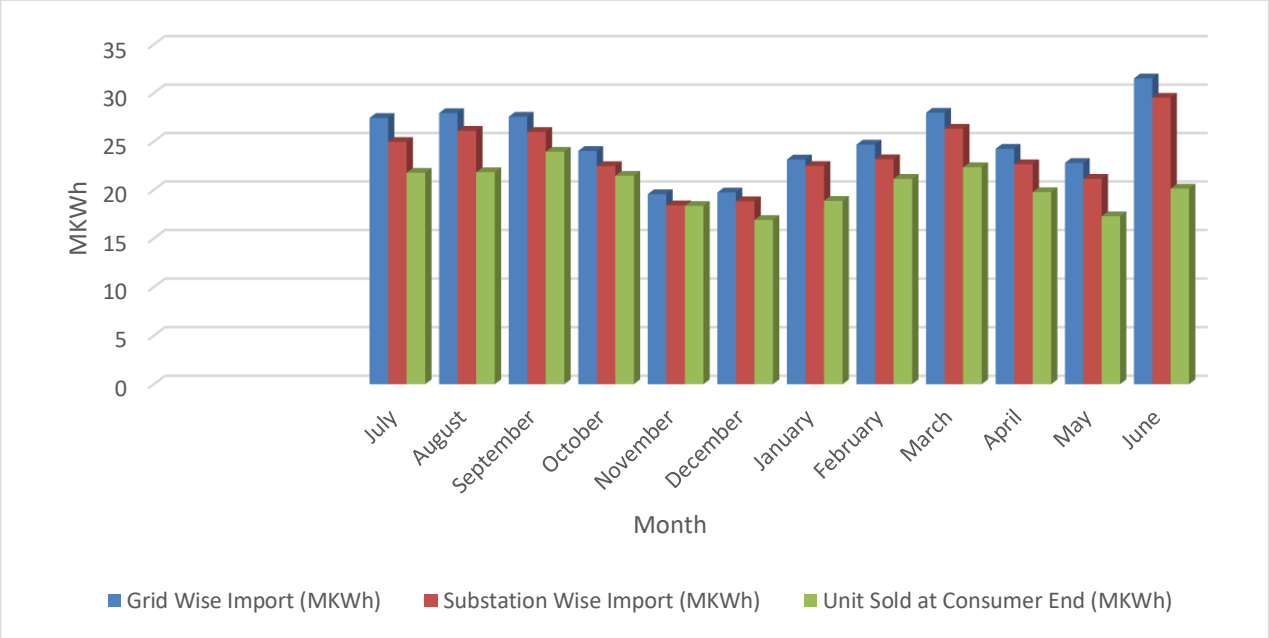


Fig 4.2.1: Grid and Sub-station wise import with Unit sold at consumer end, 2017-2018

Table 4.2.2: System Loss of JPBS in 2016-17

Month	Grid Wise Import (MKWh)	Substation Wise Import (MKWh)	Unit Sold at Consumer End (MKWh)	Total System Loss (MKWh)	Sub-station System Loss (MKWh)	Grid to 33 KV Line Loss (MKWh)
July	23.527	22.461	18.841	4.686	3.621	1.065
August	20.146	19.319	18.417	1.729	0.901	0.827
September	21.168	20.323	17.974	3.195	2.349	0.846
October	20.120	19.261	17.512	2.608	1.749	0.859
November	17.631	17.212	16.572	1.059	0.640	0.419
December	17.929	17.348	15.183	2.746	2.165	0.580
January	21.522	20.968	18.486	3.036	2.482	0.554
February	21.540	20.352	19.103	2.437	1.249	1.188
March	24.111	22.154	19.746	4.365	2.409	1.956
April	20.052	19.069	16.778	3.273	2.291	0.983
May	18.986	18.231	14.880	4.105	3.351	0.755
June	25.084	23.523	17.622	7.462	5.901	1.562

From the Table 4.2.2, we found that the 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 huge. Where form October, 2016 to January, 2017; during winter season, system losses were below than 4MKWh. In July 2016 and June 2017; both of these in summer, we found the total system loss about 3 times higher than winter.

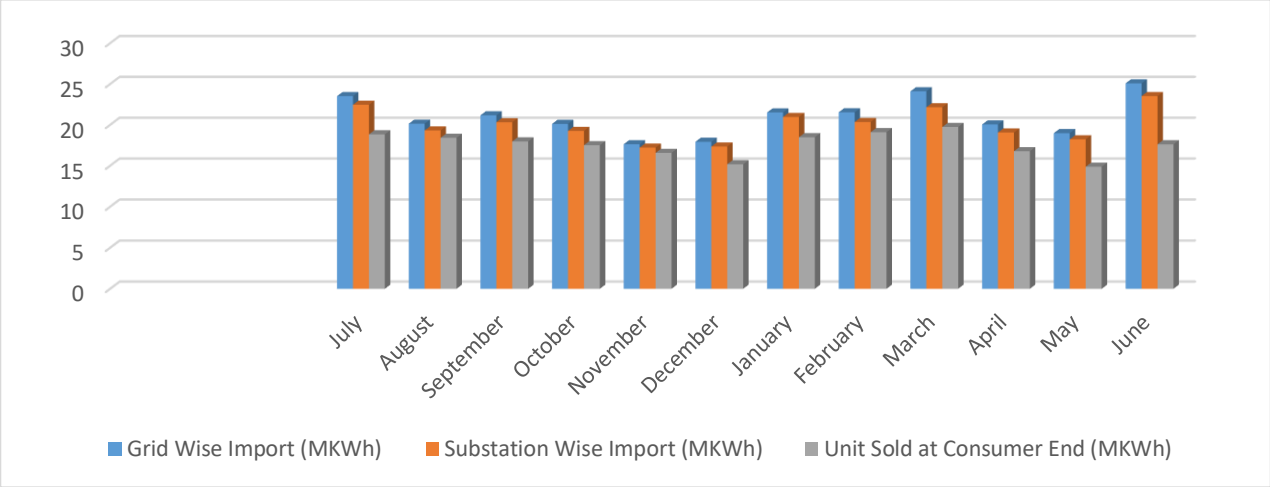


Fig 4.2.2: Grid and Sub-station wise import with Unit sold at consumer end, 2016-2017

Table 4.2.3: System Loss of JPBS in 2015-16

Month	Grid Wise Import (MKWh)	Substation Wise Import (MKWh)	Unit Sold at Consumer End (MKWh)	Total System Loss (MKWh)	Sub-station System Loss (MKWh)	Grid to 33 KV Line Loss (MKWh)
July	20.248	20.019	15.191	5.057	4.829	0.228
August	19.995	19.418	16.818	3.177	2.599	0.578
September	20.042	19.352	16.450	3.592	2.902	0.690
October	18.616	18.096	17.165	1.451	0.931	0.520
November	14.803	14.179	13.836	0.966	0.343	0.624
December	15.402	15.002	13.026	2.376	1.976	0.400
January	18.821	18.296	15.855	2.965	2.440	0.525
February	21.320	20.722	18.960	2.361	1.762	0.599
March	22.910	21.948	19.283	3.627	2.665	0.962
April	21.566	20.484	17.309	4.257	3.175	1.082
May	17.900	17.224	14.314	3.586	2.910	0.676
June	20.416	19.461	15.941	4.475	3.520	0.955

As we found from the Table 4.2.3, 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 huge. Where form October, 2015 to January, 2016; during winter season, system losses were below than 3MKWh. In July 2016 and June 2017; 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 for this. Illegal use of electricity rise in summer very badly. That's why; loss is much higher in summer. PBS try to stop illegal use of electricity but public awareness can stop this "Thief Loss". PBS also has some loss for storms during summer and rainy season.

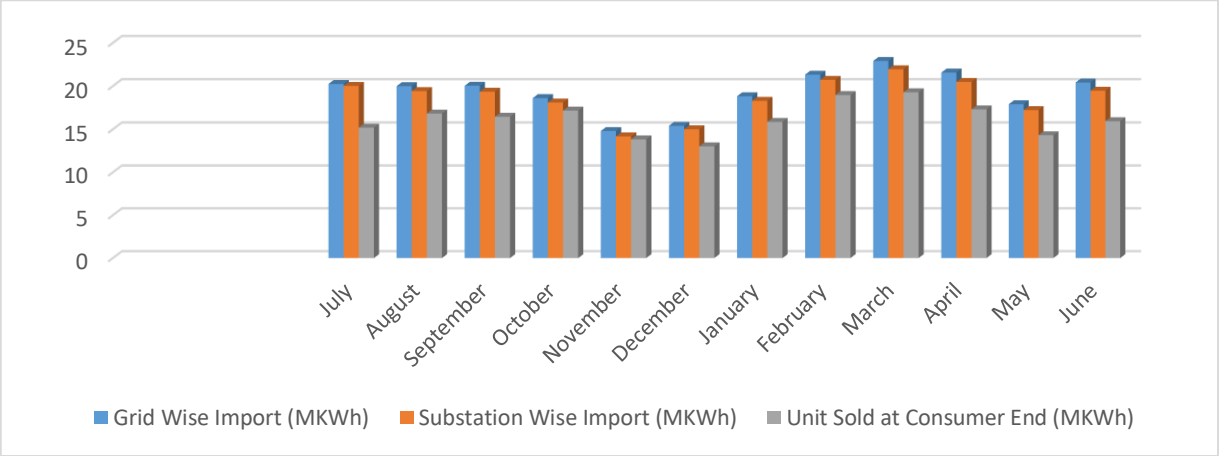


Fig 4.2.3: Grid and Sub-station wise import with Unit sold at consumer end, 2015-2016

We know that there are certain losses which affect the economy of the power system. It is a well-known fact that all energy supplied to a distribution utility does not reach the end consumer. A substantial amount of energy is lost in the distribution system by way of Technical and Non-Technical losses. The distribution system accounts for highest technical and non-technical losses in the power sector. In Bangladesh, the percentage of transmission and distribution losses has been quite high. Distribution line losses are comprised of two types: Technical losses and Non-Technical losses.

4.7.1 Technical Losses

The technical losses are due to energy dissipated in the conductors, equipment used for transmission line, transformer, sub transmission line and distribution line and magnetic losses in transformers.

4.7.2 Non-Technical Losses

Losses Non- Technical losses are more difficult to measure because these losses are often unaccounted for by the system operators and thus have no recorded information. For example, if a monthly-read meter is read incorrectly such that the consumption is one month is too low, when the meter is read correctly next month, there will be additional KWh recorded. The missing KWh will initially appear to be losses of electricity.

4.8 Summary

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 IPP and local Government (GOV), central GOB, 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 JPBS is low from some other PBS. JPBS tries to reduce their problems.

CHAPTER 5

REVENUE AND CONSUMERS OF JAMALPUR PBS

5.1 Introduction

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

5.2 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:

5.2.1 Domestic Consumers

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

Domestic consumers are classified into eight slabs. These are

1. Minimum KWh
2. 0-50 KWh
3. 0-75 KWh
4. 76-200 KWh
5. 201-300 KWh
6. 301-400 KWh
7. 401-600 KWh
8. Above 600 KWh

Types of the other consumer category are follows:

5.2.2 Commercial Consumers

Commercial consumers are actually related with 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 and community hall, Rest house, Cinema hall, Mobile Tower, Petrol/CNG pump Station.

5.2.3 Charitable Institute

Charitable institutes are depending on 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,

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

5.2.4 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. JPBS has up to 5% revenue of Total. It depends on harvest seasons.

5.2.5 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.

Types of consumer under this category will be as follows:

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, Police station, Camp, Outpost etc. and BDR Camp, BOP Installation etc.

5.2.6 Large Power

Palli Bidyut Samity will implement primary metering (H.T metering) connection for such type of 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.

Types of consumer under this category will be as follows:

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, Cantonment, Air or Naval base/installation etc. Police station, BDR Camp, BOP Installation etc.

5.2.7 33KV

33KV consumers are mostly industries. They have an individual sub-station for consuming energy. JPBS has on consumer in this class till now.

5.2.8 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 rural area. These are developing a village early.

5.3 Description of Table and its Analysis

In 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 consumer and its increment or decrement in monthly, used electricity in KWh and its monthly status and revenue increment or decrement in monthly. From these analyses we will see that the present condition of the revenue of BREB.

Table 5.1.1: Monthly Revenue data of JPBS, 2017-2018

Customer Class	Tariff Rate	July						August					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		356526	1.64	24769	12.14	2,229,210	1.85	370226	1.70	24877	12.03	2,238,930	1.85
0-50	3.85	2160827	9.94	43303	21.23	9,401,759	7.80	2163375	9.92	43303	20.95	9,411,569	7.76
0-75	3.80	5641430	25.94	75262	36.90	23,318,984	19.34	5694400	26.11	75935	36.73	23,537,095	19.42
76-200	5.14	6000254	27.59	48414	23.74	32,051,656	26.59	5969270	27.37	48414	23.42	31,892,398	26.31
201-300	5.36	1969483	9.06	8280	4.06	10,763,429	8.93	1800985	8.26	9780	4.73	9,897,780	8.17
301-400	5.63	597300	2.75	2724	1.34	3,430,899	2.85	500450	2.29	3724	1.80	2,910,634	2.40
401-600	8.70	77028	0.35	900	0.44	692,644	0.57	60570	0.28	440	0.21	537,959	0.44
600++	9.98	60120	0.28	310	0.15	610,606	0.51	50125	0.23	250	0.12	509,956	0.42
Total		**16862968**	**77.54**	**203962**	**100%**	**82,499,187**	**68.43**	**16609401**	**76.16**	**206723**	**100%**	**80,936,321**	**66.77**
Commercial	9.80	1594637	7.33	12355		16,235,431	13.47	1576478	7.23	12374		16,034,642	13.23
Charitable	5.22	347398	1.60	3734		1,969,931	1.63	381411	1.75	3745		2,146,136	1.77
Irrigation	3.82	1096073	5.04	9555		4,695,180	3.89	1130925	5.19	9476		4,780,221	3.94
General Power	7.66	1030916	4.74	1791		8,448,421	7.01	1108817	5.08	1795		9,105,256	7.51
Large Power	7.57	511354	2.35	113		4,420,781	3.67	644540	2.96	116		5,536,233	4.57
33 KV	7.49	289254	1.33	2		2,176,612	1.81	340890	1.56	2		2,563,366	2.11
Street Light	7.17	14045	0.06	43		105,876	0.09	15225	0.07	43		111,535	0.09
Grand Total		**21,746,645**	**100%**	**231,555**		**120,551,419**	**100%**	**21,807,687**	**100%**	**234,274**		**121,213,710**	**100%**

Customer Class	Tariff Rate	September						October					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		290225	1.21	19882	9.44	1,789,380	1.37	280475	1.31	27519	12.87	2,476,710	2.10
0-50	3.85	2726513	11.40	56520	26.85	11,910,075	9.12	2461224	11.48	50967	23.83	10,749,887	9.11
0-75	3.80	6138968	25.67	86943	41.30	25,501,653	19.52	6419698	29.95	86734	40.55	26,563,202	22.51
76-200	5.14	5704270	23.86	32127	15.26	30,123,123	23.06	4297122	20.04	38212	17.86	23,042,507	19.52
201-300	5.36	2430985	10.17	10780	5.12	13,299,580	10.18	1658008	7.73	6547	3.06	9,050,598	7.67
301-400	5.63	1436450	6.01	3724	1.77	8,180,314	6.26	898094	4.19	3347	1.56	5,139,944	4.36
401-600	8.70	55670	0.23	302	0.14	491,879	0.38	88034	0.41	301	0.14	773,421	0.66
600++	9.98	43625	0.18	261	0.12	445,251	0.34	65919	0.31	272	0.13	667,910	0.57
Total		**18826706**	**78.74**	**210539**	**100%**	**91,741,255**	**70.23**	**16168574**	**75.42**	**213899**	**100%**	**78,464,179**	**66.48**
Commercial	9.80	1692906	7.08	12496		17,207,244	13.17	1530259	7.14	12596		15,624,234	13.24
Charitable	5.22	371798	1.55	3806		2,105,443	1.61	358598	1.67	3848		2,035,931	1.73
Irrigation	3.82	1307983	5.47	9446		5,330,378	4.08	1451449	6.77	9410		5,993,110	5.08
General Power	7.66	962867	4.03	1794		7,955,329	6.09	962891	4.49	1809		7,893,628	6.69
Large Power	7.57	468930	1.96	117		4,183,266	3.20	511247	2.38	119		4,593,275	3.89
33 KV	7.49	267276	1.12	2		2,011,997	1.54	436420	2.04	2		3,278,886	2.78
Street Light	7.17	12835	0.05	43		95,997	0.07	18685	0.09	41		138,293	0.12
Grand Total		**23,911,301**	**100%**	**238,243**		**130,630,909**	**100%**	**21,438,123**	**100%**	**241,724**		**118,021,536**	**100%**

Customer Class	Tariff Rate	November						December					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		238434	1.30	49774	22.80	4,479,660	4.32	0	0.00	0	0.00	0	0.00
0-50	3.85	1947228	10.62	50236	23.01	8,752,728	8.44	2771849	16.42	63798	28.80	12,266,569	12.29
0-75	3.80	7020061	38.29	86916	39.82	28,849,132	27.80	4215968	24.97	61656	27.83	18,405,272	18.44
76-200	5.14	672359	3.67	12863	5.89	3,777,500	3.64	2751063	16.29	56847	25.66	16,414,468	16.44
201-300	5.36	2865928	15.63	14836	6.80	15,732,274	15.16	1607764	9.52	27176	12.27	9,843,655	9.86
301-400	5.63	420469	2.29	2631	1.21	2,433,015	2.34	203905	1.21	8203	3.70	1,432,583	1.44
401-600	8.70	217248	1.18	832	0.38	1,910,858	1.84	60204	0.36	2708	1.22	627,597	0.63
600++	9.98	102494	0.56	206	0.09	1,031,938	0.99	45226	0.27	1165	0.53	513,043	0.51
Total		**13484221**	**73.54**	**218294**	**100%**	**66,967,105**	**64.54**	**11655979**	**69.03**	**221553**	**100%**	**59,503,187**	**59.61**
Commercial	9.80	1431798	7.81	12737		14,656,359	14.13	1364237	8.08	12896		14,560,747	14.59
Charitable	5.22	296990	1.62	3889		1,727,007	1.66	215378	1.28	3942		1,352,432	1.35
Irrigation	3.82	1357484	7.40	9371		5,676,067	5.47	1699090	10.06	9245		7,457,756	7.47
General Power	7.66	833376	4.54	1809		7,027,073	6.77	1113197	6.59	1791		9,504,387	9.52
Large Power	7.57	484475	2.64	116		4,341,704	4.18	420754	2.49	117		3,977,533	3.98
33 KV	7.49	434605	2.37	2		3,265,291	3.15	397834	2.36	2		3,318,063	3.32
Street Light	7.17	13280	0.07	41		97,435	0.09	18320	0.11	44		144,352	0.14
Grand Total		**18,336,229**	**100%**	**246,259**		**103,758,041**	**100%**	**16,884,789**	**100%**	**249,590**		**99,818,457**	**100%**

Customer Class	Tariff Rate	January						February					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
0-50	3.85	3920929	20.80	77116	34.30	17,023,477	16.08	3952929	18.71	87116	38.09	17,396,677	15.43
0-75	3.80	3822528	20.28	75716	33.68	17,183,012	16.23	3446638	16.31	85716	37.48	15,929,452	14.13
76-200	5.14	2963819	15.72	42666	18.98	17,219,464	16.26	2932593	13.88	32581	14.24	16,797,157	14.90
201-300	5.36	584844	3.10	26236	11.67	3,989,511	3.77	454732	2.15	16236	7.10	2,997,872	2.66
301-400	5.63	56204	0.30	2274	1.01	395,198	0.37	41102	0.19	6274	2.74	404,284	0.36
401-600	8.70	26110	0.14	743	0.33	261,398	0.25	16212	0.08	743	0.32	169,347	0.15
600++	9.98	8637	0.05	56	0.02	93,816	0.09	5637	0.03	56	0.02	61,716	0.05
Total		**11383071**	**60.39**	**224807**	**100%**	**56,165,876**	**53.04**	**10849843**	**51.36**	**228722**	**100%**	**53,756,505**	**47.68**
Commercial	9.80	1332267	7.07	13038		14,255,210	13.46	1258385	5.96	13177		13,418,425	11.90
Charitable	5.22	188942	1.00	3962		1,194,027	1.13	183344	0.87	4008		1,167,422	1.04
Irrigation	3.82	3828337	20.31	9994		16,028,889	15.14	7066652	33.45	10556		28,980,506	25.70
General Power	7.66	1141399	6.06	1809		9,690,785	9.15	956636	4.53	1818		8,190,062	7.26
Large Power	7.57	520755	2.76	115		4,792,059	4.53	407636	1.93	114		3,871,665	3.43
33 KV	7.49	428558	2.27	2		3,570,654	3.37	375901	1.78	2		3,145,531	2.79
Street Light	7.17	24628	0.13	45		192,682	0.18	27256	0.13	46		213,520	0.19
Grand Total		**18,847,957**	**100%**	**253,772**		**105,890,182**	**100%**	**21,125,653**	**100%**	**258,443**		**112,743,636**	**100%**

Customer Class	Tariff Rate	March						April					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
0-50	3.85	3932728	17.62	87116	37.43	17,318,903	14.69	3885928	19.67	58116	24.49	16,413,723	15.05
0-75	3.80	3556749	15.93	89737	38.56	16,470,421	13.97	4580829	23.19	89737	37.82	20,566,741	18.86
76-200	5.14	2912595	13.05	32581	14.00	16,688,168	14.16	1591346	8.06	62181	26.20	10,227,361	9.38
201-300	5.36	348237	1.56	16236	6.98	2,390,851	2.03	1348326	6.83	17236	7.26	8,116,358	7.44
301-400	5.63	41303	0.19	6274	2.70	405,494	0.34	287423	1.46	9234	3.89	1,961,136	1.80
401-600	8.70	26211	0.12	743	0.32	262,337	0.22	105322	0.53	741	0.31	998,020	0.92
600++	9.98	5535	0.02	56	0.02	60,625	0.05	3235	0.02	56	0.02	36,015	0.03
Total		**10823358**	**48.48**	**232743**	**100%**	**53,596,799**	**45.46**	**11802409**	**59.75**	**237301**	**100%**	**58,319,354**	**53.49**
Commercial	9.80	1296023	5.81	13225		13,892,092	11.78	1456427	7.37	13355		15,607,990	14.31
Charitable	5.22	205744	0.92	4034		1,296,243	1.10	281136	1.42	4064		1,730,248	1.59
Irrigation	3.82	8232007	36.87	10711		33,621,057	28.52	4605816	23.32	10839		19,214,087	17.62
General Power	7.66	1023714	4.59	1808		8,789,935	7.46	881623	4.46	1811		7,628,298	7.00
Large Power	7.57	423672	1.90	112		3,973,861	3.37	363392	1.84	114		3,495,764	3.21
33 KV	7.49	299318	1.34	2		2,561,095	2.17	345903	1.75	2		2,914,243	2.67
Street Light	7.17	20760	0.09	46		163,502	0.14	15670	0.08	46		124,308	0.11
Grand Total		**22,324,596**	**100%**	**262,681**		**117,894,584**	**100%**	**19,752,376**	**100%**	**267,532**		**109,034,292**	**100%**

Customer Class	Tariff Rate	May						June					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
0-50	3.85	4783519	27.71	48116	19.70	19,619,448	19.38	4104175	20.41	58111	23.19	17,253,850	14.75
0-75	3.80	3481625	20.17	89737	36.74	16,169,925	15.97	5413254	26.92	72546	28.95	23,466,666	20.06
76-200	5.14	3492465	20.23	78121	31.99	20,986,959	20.73	3355026	16.68	63321	25.27	19,867,917	16.98
201-300	5.36	366223	2.12	17236	7.06	2,518,371	2.49	536221	2.67	42375	16.91	4,115,835	3.52
301-400	5.63	87226	0.51	10234	4.19	780,952	0.77	396754	1.97	13264	5.29	2,720,064	2.32
401-600	8.70	4417	0.03	741	0.30	59,603	0.06	46545	0.23	852	0.34	454,169	0.39
600++	9.98	3239	0.02	56	0.02	36,057	0.04	4462	0.02	150	0.06	51,493	0.04
Total		**12218714**	**70.79**	**244241**	**100%**	**60,171,315**	**59.44**	**13856437**	**68.90**	**250619**	**100%**	**67,929,994**	**58.06**
Commercial	9.80	1451576	8.41	13485		15,515,405	15.33	1697677	8.44	13712		18,048,685	15.43
Charitable	5.22	289956	1.68	4129		1,782,700	1.76	316672	1.57	4176		1,934,488	1.65
Irrigation	3.82	1255198	7.27	10845		5,752,582	5.68	1862612	9.26	10678		8,110,717	6.93
General Power	7.66	1056367	6.12	1823		9,118,953	9.01	1338696	6.66	1830		11,388,995	9.73
Large Power	7.57	686345	3.98	118		6,334,503	6.26	728747	3.62	121		6,815,146	5.82
33 KV	7.49	287321	1.66	2		2,436,718	2.41	284433	1.41	2		2,560,299	2.19
Street Light	7.17	15433	0.09	46		122,485	0.12	26917	0.13	46		210,909	0.18
Grand Total		**17,260,910**	**100%**	**274,689**		**101,234,661**	**100%**	**20,112,191**	**100%**	**281,184**		**116,999,233**	**100%**

If we look at July-2017, Domestic consumer consumed total 16862968 units, Number of total consumer 203962 and total revenue82499187TK where minimum slab was 356526 units, Number of consumer 24769 and revenue 2229210TK. In 0-50 was 2160827 units, Number of consumer 43303 and revenue 9401759TK. In 0-75 was 5641430 units, Number of consumer 75262, and revenue 23318984TK. In 76-200 was 6000254 units, Number of consumer 48414 and revenue 32051656TK. In 201-300 was 1969483 units, Number of consumer 8280, and revenue 10763429 TK. In 301-400 was 597300 units, Number of consumer 2724, and revenue 3430899 TK. In 401-600 was 77028 units, Number of consumer 900, and revenue 692644 TK and Above 600 was 60120 units, Number of consumer 310, and revenue 610606 TK. In Commercial consumer consumed total 1594637 units, Number of consumer 12355 and revenue 16235431 TK. Charitable institute consumer consumed total 347398 units, Number of consumer 3734, and revenue 1969931 TK. Irrigation consumers consumed total 1096073 units, Number of consumer 9555 and revenue 4695180 TK. In General power consumer consumed total 1030916 units, Number of consumer 1791, and revenue 8448421TK. Large power consumer consumed total 511354 units, Number of consumer 113and revenue 4420781 TK. In 33 KV Consumer consumed total 289254 units, Number of consumer 2, and revenue 2176612 TK. In Street Light, total consumed energy 14045 units, Number of bill 43 and revenue 105876 Tk.

At December -2017 Domestic consumer consumed total 11655979 units, Number of total consumer 221553and total revenue59503187 Tk, where minimum slab was 0 units, Number of consumer 0 and Revenue 0Tk. In 0-50 were 2771849 units, Number of consumer 63798 and Revenue 12266569 Tk. In 0-75 were 7020061 units, Number of consumer 86916 and Revenue 28849132 Tk. In 76-200 were 672359 units, Number of consumer 12863 and Revenue3777500 TK. In 201-300 was 1607764 units, Number of consumer 27176, and revenue 9843655 TK. In 301-400 was 203905 units, Number of consumer 8203, and revenue 1432583 Tk. In 401-600 was 60204 units, Number of consumer 2708, and revenue 627597 TK and Above 600 was 45226 units, Number of consumer 1165, and revenue 513043 TK. These two slabs had abnormal values. Even some values of Domestic consume units are abnormal.

Table 5.1.2: Monthly Revenue data of JPBS, 2016-2017

Customer Class	Tariff Rate	July'16						August'16					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		253260	1.35	19696	11.89	1,772,640	1.68	222702	1.21	24464	14.39	2,201,760	2.08
0-50	3.85	1675890	8.90	34560	20.86	7,316,177	6.91	1498866	8.14	30343	17.84	6,529,209	6.15
0-75	3.80	5825790	30.94	78242	47.23	24,094,110	22.77	4406960	23.94	59570	35.03	18,235,742	17.19
76-200	5.14	2711063	14.40	22125	13.36	14,488,002	13.69	4634060	25.18	38951	22.91	24,792,867	23.37
201-300	5.36	2152029	11.43	6771	4.09	11,704,262	11.06	1008419	5.48	10749	6.32	5,673,903	5.35
301-400	5.63	956700	5.08	3046	1.84	5,462,419	5.16	268153	1.46	2896	1.70	1,582,115	1.49
401-600	8.70	222509	1.18	765	0.46	1,955,065	1.85	294680	1.60	2625	1.54	2,629,488	2.48
600++	9.98	138224	0.73	460	0.28	1,392,340	1.32	252891	1.37	440	0.26	2,536,423	2.39
Total		**13935465**	**74.01**	**165665**	**100%**	**68,185,015**	**64.44**	**12586731**	**68.39**	**170038**	**100%**	**64,181,507**	**60.50**
Commercial	9.80	1556535	8.27	11037		15,760,548	14.89	1465957	7.97	11261		14,954,924	14.10
Charitable	5.22	326320	1.73	3238		1,831,056	1.73	299624	1.63	3251		1,713,148	1.61
Irrigation	3.82	1227700	6.52	8984		5,097,016	4.82	1921850	10.44	8917		7,799,657	7.35
General Power	7.66	1063356	5.65	1742		8,757,679	8.28	1220117	6.63	1749		9,917,225	9.35
Large Power	7.57	690936	3.67	110		5,971,083	5.64	888014	4.82	111		7,349,788	6.93
33 KV	7.49	13355	0.07	1		104,479	0.10	12418	0.07	1		97,458	0.09
Street Light	7.17	14733	0.08	40		107,250	0.10	10175	0.06	40		75,340	0.07
Grand Total		**18,828,400**	**100%**	**190,817**		**105,814,126**	**100%**	**18,404,886**	**100%**	**195,368**		**106,089,047**	**100%**

Customer Class	Tariff Rate	September'16						October'16					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		393023	2.19	26965	15.46	2,426,850	2.41	431646	2.47	32109	17.90	2,889,810	2.94
0-50	3.85	1743572	9.71	35259	20.22	7,594,227	7.53	1801911	10.30	37088	20.68	7,864,557	8.01
0-75	3.80	3695427	20.57	49413	28.33	15,277,985	15.14	5032629	28.76	68529	38.21	20,837,266	21.23
76-200	5.14	5319740	29.62	49575	28.42	28,582,865	28.33	3155177	18.03	25500	14.22	16,855,126	17.17
201-300	5.36	950053	5.29	9708	5.57	5,335,033	5.29	872600	4.99	9077	5.06	4,904,106	5.00
301-400	5.63	261341	1.45	2906	1.67	1,544,013	1.53	584194	3.34	6018	3.36	3,439,491	3.50
401-600	8.70	35380	0.20	347	0.20	316,499	0.31	155684	0.89	802	0.45	1,374,579	1.40
600++	9.98	45427	0.25	245	0.14	462,997	0.46	146171	0.84	232	0.13	1,468,232	1.50
Total		**12443963**	**69.28**	**174418**	**100%**	**61,540,469**	**61.00**	**12180012**	**69.60**	**179355**	**100%**	**59,633,167**	**60.75**
Commercial	9.80	1435428	7.99	11407		14,544,046	14.42	1427777	8.16	11593		14,534,737	14.81
Charitable	5.22	292918	1.63	3304		1,669,160	1.65	289968	1.66	3366		1,659,659	1.69
Irrigation	3.85	1926791	10.73	8974		7,681,972	7.61	1777423	10.16	9036		7,228,995	7.36
General Power	7.66	1159554	6.46	1758		9,500,349	9.42	1101213	6.29	1759		9,010,517	9.18
Large Power	7.57	681635	3.79	111		5,775,337	5.72	697425	3.99	111		5,901,430	6.01
33 KV	7.49	11762	0.07	1		93,120	0.09	13750	0.08	1		108,006	0.11
Street Light	7.17	10775	0.06	40		80,138	0.08	12425	0.07	40		90,612	0.09
Grand Total		**17,962,826**	**100%**	**200,013**		**100,884,591**	**100%**	**17,499,993**	**100%**	**205,261**		**98,167,123**	**100%**

Customer Class	Tariff Rate	November'16						December'16					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		614864	3.71	41919	23.01	3,772,710	3.99	575391	3.79	53369	28.81	4,803,210	5.40
0-50	3.85	2003975	12.10	40505	22.24	8,727,929	9.23	2002475	13.20	44850	24.21	8,830,779	9.93
0-75	3.80	4293975	25.93	57289	31.45	17,749,373	18.77	3469915	22.87	48939	26.42	14,409,187	16.20
76-200	5.14	2984475	18.02	30555	16.77	16,104,091	17.03	2788780	18.38	26266	14.18	14,990,993	16.85
201-300	5.36	589395	3.56	6158	3.38	3,313,137	3.50	495690	3.27	7449	4.02	2,843,148	3.20
301-400	5.63	359280	2.17	3654	2.01	2,114,114	2.24	188440	1.24	2961	1.60	1,134,952	1.28
401-600	8.70	329582	1.99	1701	0.93	2,910,053	3.08	174345	1.15	955	0.52	1,540,764	1.73
600++	9.98	241023	1.46	370	0.20	2,416,930	2.56	158846	1.05	430	0.23	1,597,699	1.80
Total		**11416569**	**68.94**	**182151**	**100%**	**57,108,337**	**60.39**	**9853882**	**64.95**	**185219**	**100%**	**50,150,732**	**56.37**
Commercial	9.80	1418538	8.57	11727		14,482,212	15.31	1270169	8.37	11812		13,060,276	14.68
Charitable	5.22	276114	1.67	3397		1,592,790	1.68	194754	1.28	3433		1,196,460	1.34
Irrigation	3.94	1737740	10.49	9057		7,112,397	7.52	1744887	11.50	8969		7,140,880	8.03
General Power	7.66	989588	5.98	1760		8,200,850	8.67	1261542	8.31	1761		10,393,323	11.68
Large Power	7.57	684874	4.14	112		5,802,828	6.14	811989	5.35	111		6,746,318	7.58
33 KV	7.49	20294	0.12	1		157,006	0.17	17304	0.11	1		134,617	0.15
Street Light	7.17	16060	0.10	40		116,324	0.12	17970	0.12	43		137,403	0.15
Grand Total		**16,559,777**	**100%**	**208,245**		**94,572,744**	**100%**	**15,172,497**	**100%**	**211,349**		**88,960,009**	**100%**

Customer Class	Tariff Rate	January'17						February'17					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		512397	2.77	49831	26.42	4,484,790	4.46	688460	3.61	71028	36.91	6,392,520	6.37
0-50	3.85	2524990	13.67	53976	28.61	11,070,612	11.02	2285270	11.97	55053	28.61	10,174,615	10.13
0-75	3.80	3901768	21.12	52631	27.90	16,142,493	16.07	2950340	15.45	39938	20.76	12,209,742	12.16
76-200	5.14	2205348	11.94	20115	10.66	11,838,364	11.78	1970355	10.32	18745	9.74	10,596,250	10.55
201-300	5.36	579418	3.14	7095	3.76	3,283,055	3.27	386435	2.02	4627	2.40	2,186,967	2.18
301-400	5.63	221483	1.20	2597	1.38	1,311,874	1.31	163175	0.85	1741	0.90	962,200	0.96
401-600	8.70	351006	1.90	1862	0.99	3,100,302	3.09	158282	0.83	845	0.44	1,398,178	1.39
600++	9.98	190355	1.03	530	0.28	1,913,651	1.90	190113	1.00	438	0.23	1,909,856	1.90
Total		**10486765**	**56.76**	**188637**	**100%**	**53,145,141**	**52.89**	**8792430**	**46.05**	**192415**	**100%**	**45,830,328**	**45.63**
Commercial	9.80	1269121	6.87	11919		13,051,534	12.99	1062377	5.56	12067		11,047,380	11.00
Charitable	5.22	199953	1.08	3483		1,231,917	1.23	174226	0.91	3513		1,109,832	1.11
Irrigation	3.84	4831013	26.15	9772		18,846,921	18.76	7553627	39.56	10416		29,736,591	29.61
General Power	7.66	1024367	5.54	1765		8,514,171	8.47	922082	4.83	1774		7,651,506	7.62
Large Power	7.57	416017	2.25	111		3,831,138	3.81	371626	1.95	111		3,429,509	3.41
33 KV	7.49	230946	1.25	2		1,734,757	1.73	202671	1.06	2		1,528,106	1.52
Street Light	7.17	16985	0.09	43		123,029	0.12	13070	0.07	43		95,492	0.10
Grand Total		**18,475,167**	**100%**	**215,732**		**100,478,608**	**100%**	**19,092,109**	**100%**	**220,341**		**100,428,744**	**100%**

Customer Class	Tariff Rate	March'17						April'17					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		531212	2.69	73226	37.59	6,590,340	6.32	456730	2.72	65074	33.11	5,856,660	6.28
0-50	3.85	1813840	9.19	39736	20.40	7,976,684	7.65	1963025	11.71	41772	21.25	8,601,946	9.22
0-75	3.80	3879875	19.66	52609	27.00	16,058,750	15.40	3904084	23.28	53221	27.08	16,166,044	17.33
76-200	5.14	1776610	9.00	20412	10.48	9,642,075	9.24	2917847	17.40	27291	13.88	15,680,009	16.81
201-300	5.36	441565	2.24	5823	2.99	2,512,363	2.41	383661	2.29	6222	3.17	2,211,973	2.37
301-400	5.63	154155	0.78	1749	0.90	911,618	0.87	106005	0.63	1733	0.88	640,133	0.69
401-600	8.70	159150	0.81	825	0.42	1,405,230	1.35	92325	0.55	828	0.42	823,928	0.88
600++	9.98	180245	0.91	441	0.23	1,811,418	1.74	95536	0.57	421	0.21	965,722	1.04
Total		**8936652**	**45.28**	**194821**	**100%**	**46,908,478**	**44.98**	**9919213**	**59.16**	**196562**	**100%**	**50,946,415**	**54.62**
Commercial	9.80	1127905	5.72	12137		11,693,148	11.21	1181910	7.05	12206		12,202,236	13.08
Charitable	5.22	186637	0.95	3548		1,180,024	1.13	241025	1.44	3576		1,437,347	1.54
Irrigation	3.82	7780200	39.42	10544		30,247,238	29.00	3952253	23.57	10600		16,198,561	17.37
General Power	7.70	1044319	5.29	1785		8,636,466	8.28	982333	5.86	1789		8,146,860	8.73
Large Power	7.57	413691	2.10	112		3,779,689	3.62	256009	1.53	112		2,587,824	2.77
33 KV	7.49	229480	1.16	2		1,728,905	1.66	221109	1.32	2		1,666,206	1.79
Street Light	7.17	16765	0.08	43		121,416	0.12	13141	0.08	44		96,280	0.10
Grand Total		**19,735,649**	**100%**	**222,992**		**104,295,364**	**100%**	**16,766,993**	**100%**	**224,891**		**93,281,729**	**100%**

Customer Class	Tariff Rate	May'17						June'17					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		458146	3.08	58274	29.40	5,244,660	6.02	515196	2.93	43959	21.96	3,956,310	3.97
0-50	3.85	2184120	14.69	47967	24.20	9,608,037	11.03	2374470	13.48	47745	23.86	10,335,335	10.36
0-75	3.80	4620733	31.07	63576	32.07	19,148,185	21.97	4290170	24.36	57565	28.76	17,741,771	17.79
76-200	5.14	2071795	13.93	19654	9.92	11,140,376	12.78	4139010	23.50	37728	18.85	22,217,711	22.28
201-300	5.36	296580	1.99	5286	2.67	1,721,819	1.98	490020	2.78	8111	4.05	2,829,282	2.84
301-400	5.63	168280	1.13	2146	1.08	1,001,066	1.15	214830	1.22	4579	2.29	1,323,968	1.33
401-600	8.70	102700	0.69	741	0.37	912,015	1.05	46428	0.26	240	0.12	409,924	0.41
600++	9.98	198375	1.33	573	0.29	1,994,336	2.29	54485	0.31	210	0.10	552,868	0.55
Total		**10100729**	**67.93**	**198217**	**100%**	**50,770,494**	**58.26**	**12124609**	**68.85**	**200137**	**100%**	**59,367,169**	**59.52**
Commercial	9.80	1184669	7.97	12234		12,212,317	14.01	1385562	7.87	12266		14,196,191	14.23
Charitable	5.22	247031	1.66	3607		1,458,127	1.67	291607	1.66	3649		1,685,592	1.69
Irrigation	3.82	1350564	9.08	10564		6,385,182	7.33	1659562	9.42	10231		6,938,429	6.96
General Power	7.66	1169103	7.86	1793		9,535,542	10.94	1165793	6.62	1799		9,486,942	9.51
Large Power	7.57	582812	3.92	113		5,011,143	5.75	764768	4.34	115		6,415,050	6.43
33 KV	7.49	224077	1.51	2		1,688,437	1.94	204331	1.16	2		1,540,539	1.54
Street Light	7.17	10660	0.07	43		80,384	0.09	14265	0.08	43		106,054	0.11
Grand Total		**14,869,645**	**100%**	**226,573**		**87,141,626**	**100%**	**17,610,497**	**100%**	**228,242**		**99,735,966**	**100%**

If we look at July-2016, Domestic consumer consumed total 13935465 units, Number of total consumer 165665 and total revenue 68185015 TK where minimum slab was 253260 units, Number of consumer 19696 and revenue 1772640 TK. In 0-50 was 1675890 units, Number of consumer 34560 and revenue 7316177 TK. In 0-75 was 5825790 units, Number of consumer 78242, and revenue 24094110 TK. In 76-200 was 2711063 units, Number of consumer 22125 and revenue 14488002 TK. In 201-300 was 2152029 units, Number of consumer 6771, and revenue 11704262 TK. In 301-400 was 956700 units, Number of consumer 3046, and revenue 5462419 TK. In 401-600 was 222509 units, Number of consumer 765, and revenue 1955065 TK and Above 600 was 138224 units, Number of consumer 460, and revenue 1392340 TK. In Commercial consumer consumed total 1556535 units, Number of consumer 11037 and revenue 15760548 TK. Charitable institute consumer consumed total 326320 units, Number of consumer 3238, and revenue 1831056 TK. Irrigation consumers consumed total1227700 units, Number of consumer 8984 and revenue 5097016 TK. In General power consumer consumed total 1063356 units, Number of consumer 1742, and revenue 8757679 TK. Large power consumer consumed total 690936 units, Number of consumer 110 and revenue 5971083 TK. In 33 KV Consumer consumed total 13355 units, Number of consumer 1, and revenue 104479 TK. In Street Light, total consumed energy 14733 units, Number of bill 40 and revenue 107250 Tk.

At December-2016 Domestic consumer consumed total 9853882 units, Number of total consumer 185219and total revenue50150732Tk, where minimum slab was 575391 units, Number of consumer 53369 and Revenue 480210 Tk. In 0-50 were 2002475 units, Number of consumer 44850 and Revenue 8830779 Tk. In 0-75 were 3469915 units, Number of consumer 48939 and Revenue 14409187 Tk. In 76-200 were 2788780 units, Number of consumer 26266 and Revenue 14990993 TK. In 201-300 was 495690 units, Number of consumer 7449, and revenue 2843148 TK. In 301-400 was 188440 units, Number of consumer 2961, and revenue 1134952 Tk. In 401-600 was 174345 units, Number of consumer 955, and revenue 1540764 TK and Above 600 was 158846 units, Number of consumer 430, and revenue 1597699 TK. These two slabs had abnormal values. Even some values of Domestic consume units are abnormal.

Table 5.1.3: Monthly Revenue data of JPBS, 2015-2016

Customer Class	Tariff Rate	July'15						August'15					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		163682	1.08	11419	9.65	1,027,710	1.22	158771	0.94	10598	8.71	953,820	1.02
0-50	3.85	1897855	12.50	33913	28.67	8,154,568	9.68	1584112	9.43	34013	27.96	6,949,157	7.45
0-75	3.87	2716554	17.90	35881	30.33	11,410,089	13.54	3878812	23.08	37681	30.97	15,953,027	17.09
76-200	5.01	5353672	35.27	35856	30.31	27,718,297	32.89	5240757	31.18	36056	29.64	27,157,593	29.10
201-300	5.19	85458	0.56	860	0.73	465,027	0.55	209458	1.25	1262	1.04	1,118,637	1.20
301-400	5.42	20647	0.14	208	0.18	117,107	0.14	240647	1.43	1108	0.91	1,332,007	1.43
401-600	8.51	28730	0.19	145	0.12	248,117	0.29	380130	2.26	906	0.74	3,257,556	3.49
600++	9.93	8723	0.06	19	0.02	87,094	0.10	19723	0.12	28	0.02	196,549	0.21
Total		**10275321**	**67.69**	**118301**	**100%**	**49,228,009**	**58.42**	**11712410**	**69.69**	**121652**	**100%**	**56,918,346**	**60.99**
Commercial	9.58	1339424	8.82	9750		13,307,056	15.79	1353066	8.05	9809		13,429,774	14.39
Charitable	4.98	281664	1.86	2554		1,509,826	1.79	298067	1.77	2624		1,587,724	1.70
Irrigation	3.85	1592271	10.49	9581		6,654,444	7.90	1571689	9.35	9458		6,517,060	6.98
General Power	7.42	1075336	7.08	1759		8,540,398	10.13	1087219	6.47	1766		8,596,813	9.21
Large Power	7.32	603871	3.98	105		4,942,442	5.87	772990	4.60	105		6,187,458	6.63
33 KV	7.20	0	0.00	0		0	0.00	0	0.00	0		0	0.00
Street Light	6.93	11821	0.08	39		85,042	0.10	11606	0.07	38		85,087	0.09
Grand Total		**15,179,708**	**100%**	**142,089**		**84,267,217**	**100%**	**16,807,047**	**100%**	**145,452**		**93,322,262**	**100%**

Customer Class	Tariff Rate	September'15						October'15					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		192924	1.17	12323	9.82	1,109,070	1.21	190764	1.11	13180	9.99	1,186,200	1.24
0-50	3.85	2787142	16.96	40655	32.40	11,746,997	12.82	2992142	17.44	39655	30.05	12,511,133	13.10
0-75	3.80	3523793	21.44	40535	32.30	14,404,070	15.72	3308793	19.29	39535	29.96	13,561,821	14.20
76-200	5.14	3546249	21.58	23858	19.01	18,824,241	20.54	4215449	24.57	31858	24.14	22,463,879	23.51
201-300	5.36	508765	8.00	4008	3.19	2,827,221	3.09	668765	3.90	4108	3.11	3,687,314	3.86
301-400	5.63	272583	1.66	2749	2.19	1,603,389	1.75	262583	1.53	2249	1.70	1,534,580	1.61
401-600	8.70	250423	1.52	1231	0.98	2,209,655	2.41	268423	1.56	1225	0.93	2,366,039	2.48
600++	9.98	173212	1.05	138	0.11	1,732,120	1.89	158212	0.92	138	0.10	1,582,414	1.66
Total		**11255091**	**68.48**	**125497**	**100%**	**54,456,763**	**59.42**	**12065131**	**70.34**	**131948**	**100%**	**58,893,380**	**61.65**
Commercial	9.80	1314823	8.00	9882		13,167,810	14.37	1361853	7.94	10099		13,917,912	14.57
Charitable	5.22	311870	1.90	2668		1,663,027	1.81	300933	1.75	2736		1,702,940	1.78
Irrigation	3.82	1647226	10.02	9284		6,719,963	7.33	1752226	10.21	9182		7,121,260	7.45
General Power	7.66	1249702	7.60	1765		10,128,504	11.05	1016629	5.93	1772		8,335,607	8.73
Large Power	7.57	643358	3.91	106		5,399,384	5.89	640668	3.73	106		5,442,243	5.70
33 KV	7.20	0	0.00	0		0	0.00	0	0.00	0		0	0.00
Street Light	6.93	14694	0.09	38		106,069	0.12	16116	0.09	38		117,160	0.12
Grand Total		**16,436,764**	**100%**	**149,240**		**91,641,520**	**100%**	**17,153,556**	**100%**	**155,881**		**95,530,502**	**100%**

Customer Class	Tariff Rate	November'15						December'15					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		399240	2.89	26806	19.92	2,412,540	3.00	275446	2.12	34152	24.66	3,073,680	4.04
0-50	3.33	1592255	11.52	31851	23.66	6,098,488	7.57	1855678	14.26	40537	29.27	7,192,832	9.45
0-75	3.80	3071264	22.21	40955	30.43	12,694,709	15.76	2365828	18.18	34469	24.88	9,851,895	12.94
76-200	5.14	2365196	17.11	18927	14.06	12,630,294	15.68	2585826	19.87	20877	15.07	13,813,084	18.15
201-300	5.36	765224	5.53	7658	5.69	4,293,089	5.33	552221	4.24	5586	4.03	3,099,582	4.07
301-400	5.63	464641	3.36	4647	3.45	2,732,127	3.39	199412	1.53	2024	1.46	1,173,300	1.54
401-600	8.70	340865	2.47	3409	2.53	3,050,921	3.79	146269	1.12	736	0.53	1,291,013	1.70
600++	9.98	219009	1.58	342	0.25	2,194,271	2.72	98578	0.76	135	0.10	987,188	1.30
Total		**9217694**	**66.67**	**134595**	**100%**	**46,106,439**	**57.24**	**8079258**	**62.07**	**138516**	**100%**	**40,482,574**	**53.19**
Commercial	9.80	1289863	9.33	10237		13,196,101	16.38	1123850	8.63	10300		11,538,326	15.16
Charitable	5.22	246263	1.78	2800		1,427,878	1.77	174572	1.34	2839		1,038,989	1.37
Irrigation	3.82	1426864	10.32	9034		5,874,464	7.29	1637757	12.58	8794		6,617,723	8.69
General Power	7.66	986165	7.13	1764		8,357,816	10.38	1271575	9.77	1766		10,361,434	13.61
Large Power	7.57	638981	4.62	110		5,436,352	6.75	708771	5.45	110		5,924,727	7.78
33 KV	7.49	0	0.00	0		0	0.00	0	0.00	0		0	0.00
Street Light	7.17	20036	0.14	38		144,726	0.18	20544	0.16	38		148,311	0.19
Grand Total		**13,825,866**	**100%**	**158,578**		**80,543,776**	**100%**	**13,016,327**	**100%**	**162,363**		**76,112,084**	**100%**

Customer Class	Tariff Rate	January'16						February'16					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		435343	2.75	35878	25.14	3,229,020	3.76	588563	3.11	42364	29.08	3,812,760	3.91
0-50	3.33	1849848	11.67	40254	28.20	7,166,347	8.35	1786989	9.43	38954	26.74	6,924,526	7.11
0-75	3.80	2159418	13.63	33959	23.79	9,054,785	10.55	1959222	10.34	30729	21.09	8,213,288	8.43
76-200	5.14	2722187	17.18	24165	16.93	14,596,180	17.01	2678621	14.14	25142	17.26	14,396,675	14.78
201-300	5.36	445932	2.81	4659	3.26	2,506,693	2.92	406252	2.14	4548	3.12	2,291,231	2.35
301-400	5.63	230767	1.46	2414	1.69	1,359,580	1.58	223893	1.18	2576	1.77	1,324,929	1.36
401-600	8.70	188943	1.19	1256	0.88	1,675,299	1.95	158519	0.84	1175	0.81	1,408,570	1.45
600++	9.98	66245	0.42	156	0.11	665,028	0.78	77500	0.41	187	0.13	778,129	0.80
Total		**8098683**	**51.11**	**142741**	**100%**	**40,252,932**	**46.91**	**7879559**	**41.58**	**145675**	**100%**	**39,150,108**	**40.20**
Commercial	9.80	1087843	6.87	10370		11,185,569	13.04	1042607	5.50	10491		10,755,842	11.04
Charitable	5.22	163674	1.03	2888		1,001,377	1.17	163060	0.86	2918		1,008,491	1.04
Irrigation	3.82	4635427	29.25	9567		17,948,241	20.92	8067935	42.58	10264		31,579,926	32.43
General Power	7.66	1161806	7.33	1758		9,499,397	11.07	1090621	5.76	1761		8,942,254	9.18
Large Power	7.57	649651	4.10	110		5,553,181	6.47	664023	3.50	109		5,643,978	5.80
33 KV	7.49	23968	0.15	1		183,970	0.21	23968	0.13	1		183,970	0.19
Street Light	7.17	24676	0.16	38		177,936	0.21	17511	0.09	38		127,942	0.13
Grand Total		**15,845,728**	**100%**	**167,473**		**85,802,603**	**100%**	**18,949,284**	**100%**	**171,257**		**97,392,511**	**100%**

Customer Class	Tariff Rate	March'16						April'16					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		515858	2.68	51686	34.53	4,651,740	4.74	685184	3.96	49071	31.88	4,416,390	4.86
0-50	3.33	1492552	7.74	30516	20.39	5,733,100	5.85	1643685	9.50	34399	22.35	6,333,449	6.96
0-75	3.80	2326238	12.07	33130	22.13	9,667,978	9.86	2746952	15.88	37926	24.64	11,386,595	12.52
76-200	5.14	2489573	12.92	25746	17.20	13,440,068	13.71	1731711	10.01	18374	11.94	9,360,353	10.29
201-300	5.36	306374	1.59	4888	3.27	1,764,380	1.80	431657	2.50	6190	4.02	2,468,453	2.71
301-400	5.63	88516	0.46	2410	1.61	558,600	0.57	399124	2.31	6142	3.99	2,400,638	2.64
401-600	8.70	48007	0.25	1123	0.75	445,760	0.45	231328	1.34	1368	0.89	2,046,869	2.25
600++	9.98	35741	0.19	181	0.12	361,222	0.37	85695	0.50	464	0.30	866,840	0.95
Total		**7302859**	**37.89**	**149680**	**100%**	**36,622,848**	**37.35**	**7955336**	**45.99**	**153934**	**100%**	**39,279,587**	**43.19**
Commercial	9.80	1056582	5.48	10607		10,922,999	11.14	1139338	6.59	10781		11,717,306	12.88
Charitable	5.22	187986	0.98	2970		1,129,503	1.15	213406	1.23	3028		1,252,339	1.38
Irrigation	3.82	9010991	46.75	10485		34,972,796	35.67	6336268	36.63	10551		24,845,854	27.32
General Power	7.66	1132518	5.88	1760		9,348,623	9.53	1091281	6.31	1743		8,984,713	9.88
Large Power	7.57	550707	2.86	107		4,809,280	4.91	482880	2.79	109		4,311,521	4.74
33 KV	7.49	16921	0.09	1		131,188	0.13	13416	0.08	1		104,936	0.12
Street Light	7.17	15111	0.08	38		110,805	0.11	65771	0.38	40		451,128	0.50
Grand Total		**19,273,675**	**100%**	**175,648**		**98,048,042**	**100%**	**17,297,696**	**100%**	**180,187**		**90,947,384**	**100%**

Customer Class	Tariff Rate	May'16						June'16					
		Unit	%	Consumers	%	Revenue	%	Unit	%	Consumers	%	Revenue	%
Domestic													
Minimum		611206	4.27	43754	27.53	3,937,860	4.83	445770	2.80	30321	18.65	2,728,890	3.02
0-50	3.85	1513813	10.58	31247	19.66	6,609,355	8.10	1651465	10.37	34133	20.99	7,211,465	7.97
0-75	3.80	3892456	27.22	53376	33.59	16,125,772	19.77	5031240	31.59	67121	41.29	20,796,787	22.98
76-200	5.14	1975276	13.81	19596	12.33	10,642,829	13.05	2662440	16.71	21610	13.29	14,225,205	15.72
201-300	5.36	494263	3.46	5844	3.68	2,795,375	3.43	569990	3.58	5760	3.54	3,199,176	3.53
301-400	5.63	185736	1.30	3416	2.15	1,131,103	1.39	178565	1.12	1815	1.12	1,050,705	1.16
401-600	8.70	98029	0.69	1218	0.77	883,351	1.08	265518	1.67	1375	0.85	2,344,514	2.59
600++	9.98	118900	0.83	460	0.29	1,198,128	1.47	275447	1.73	442	0.27	2,760,025	3.05
Total		**8889679**	**62.16**	**158911**	**100%**	**43,323,773**	**53.11**	**11080435**	**69.56**	**162577**	**100%**	**54,316,767**	**60.01**
Commercial	9.80	1188086	8.31	10936		12,175,627	14.93	1370184	8.60	11004		13,970,359	15.44
Charitable	5.22	232131	1.62	3093		1,350,829	1.66	279908	1.76	3142		1,587,840	1.75
Irrigation	3.82	2051158	14.34	10526		8,786,491	10.77	1378653	8.66	9422		5,635,186	6.23
General Power	7.66	1271920	8.89	1752		10,257,427	12.58	1081711	6.79	1741		8,769,160	9.69
Large Power	7.57	638324	4.46	110		5,440,450	6.67	709283	4.45	111		6,014,994	6.65
33 KV	7.49	16603	0.12	1		128,806	0.16	15138	0.10	1		117,834	0.13
Street Light	7.17	14496	0.10	39		105,702	0.13	13445	0.08	39		98,017	0.11
Grand Total		**14,302,397**	**100%**	**185,368**		**81,569,105**	**100%**	**15,928,757**	**100%**	**188,037**		**90,510,157**	**100%**

If we look at July-2015, Domestic consumer consumed total 10275321 units, Number of total consumer 118301 and total revenue 49228009 TK where minimum slab was 163682 units, Number of consumer 11419 and revenue 1027710 TK. In 0-50 was 1897855 units, Number of consumer 33913 and revenue 8154568 TK. In 0-75 was 2716554 units, Number of consumer 35881, and revenue 11410089 TK. In 76-200 was 5353672 units, Number of consumer 35856 and revenue 27718297 TK. In 201-300 was 85458 units, Number of consumer 860, and revenue 465027 TK. In 301-400 was 20647 units, Number of consumer 208, and revenue 117107 TK. In 401-600 was 28730 units, Number of consumer 145, and revenue 248117 TK and Above 600 was 8723 units, Number of consumer 19, and revenue 87094 TK. In Commercial consumer consumed total 1339424 units, Number of consumer 9750 and revenue 13307056 TK. Charitable institute consumer consumed total 281664 units, Number of consumer 2554, and revenue 1509826 TK. Irrigation consumers consumed total 1592271 units, Number of consumer 9581 and revenue 6654444 TK. In General power consumer consumed total 1030916 units, Number of consumer 1791, and revenue 8448421 TK. Large power consumer consumed total 603871 units, Number of consumer 105 and revenue 4942442 TK. In 33 KV Consumer consumed total 0 units, Number of consumer 0, and revenue 0 TK. In Street Light, total consumed energy 11821 units, Number of bill 39 and revenue 85042 Tk.

At December-2015, Domestic consumer consumed total 8079258 units, Number of total consumer 138516and total revenue40482574Tk, where minimum slab was 275446 units, Number of consumer 34152 and Revenue 3073680 Tk. In 0-50 were 1855678 units, Number of consumer 40537 and Revenue 7192832 Tk. In 0-75 were 2365828 units, Number of consumer 34469 and Revenue 9851895 Tk. In 76-200 were 2585826 units, Number of consumer 20877 and Revenue 13813084 TK. In 201-300 was 552221 units, Number of consumer 5586, and revenue 3099582 TK. In 301-400 was 199412 units, Number of consumer 2024, and revenue 1173300 Tk. In 401-600 was 146269 units, Number of consumer 736, and revenue 1291013 TK and Above 600 was 98578 units, Number of consumer 135, and revenue 987188 TK. These two slabs had abnormal values. Even some values of Domestic consume units are abnormal.

5.4 Graphical Analysis (Domestic)

In these processes we calculate all the month of the year of 2017-2018. Here we divided the year in three season for our capitalize which are,

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

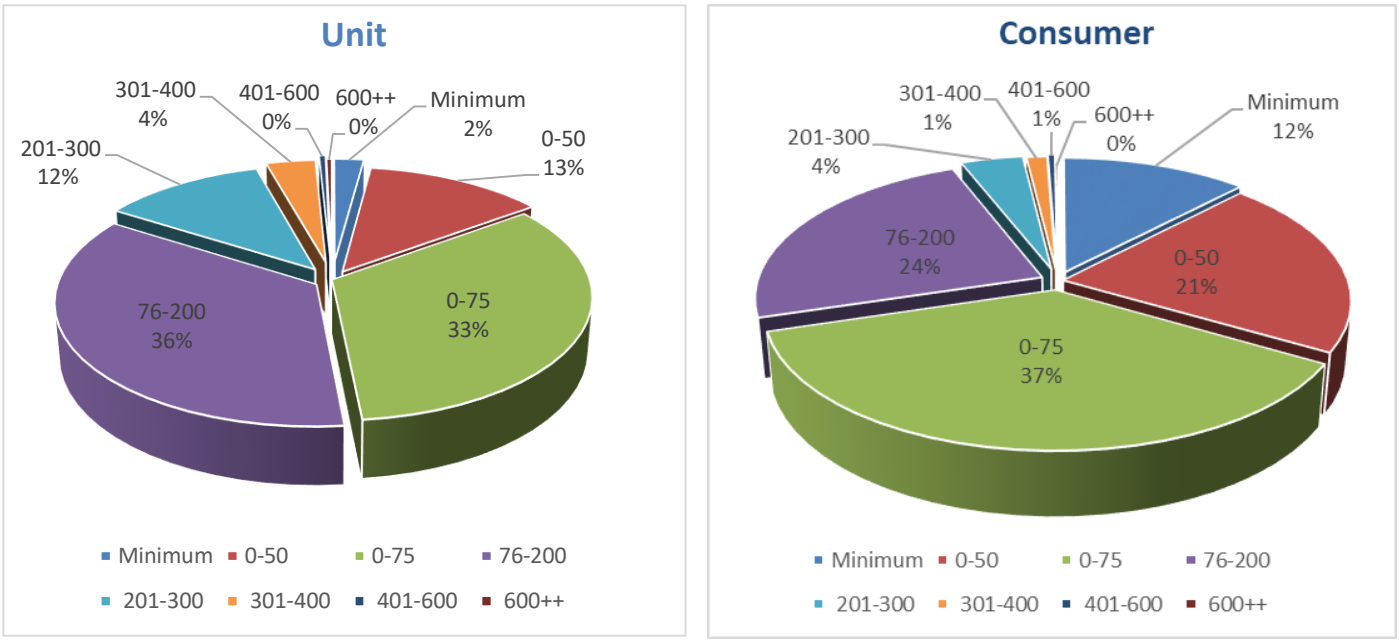


Fig 5.1.1: Domestic Unit and Consumer on July, 2017

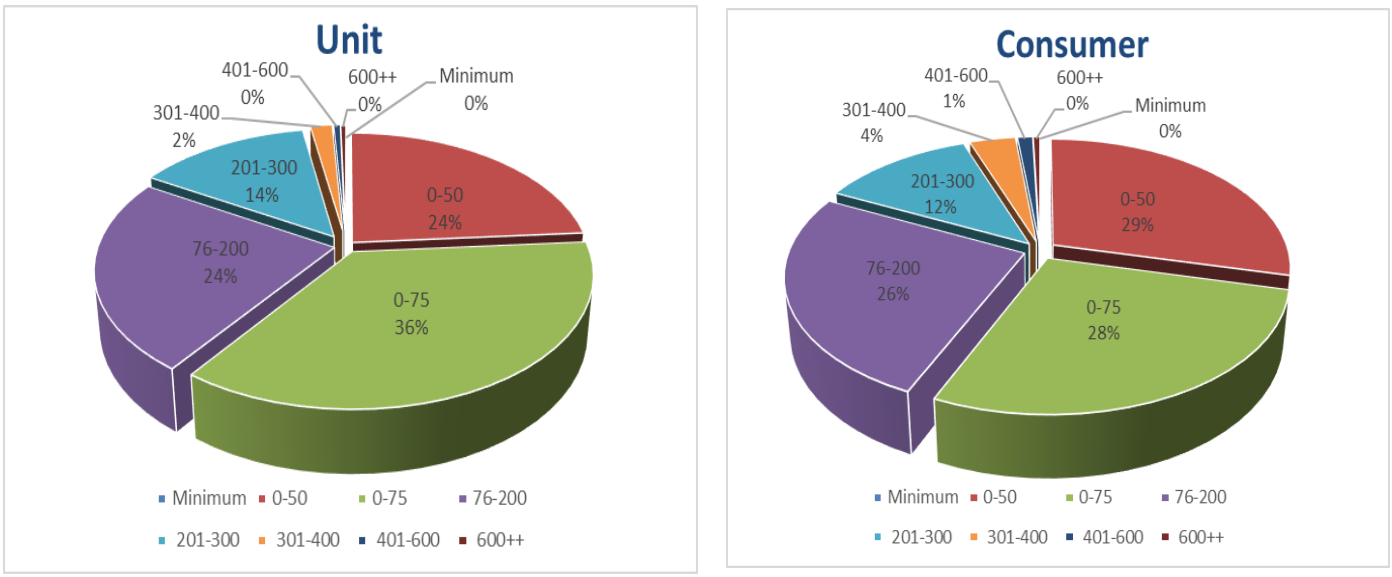
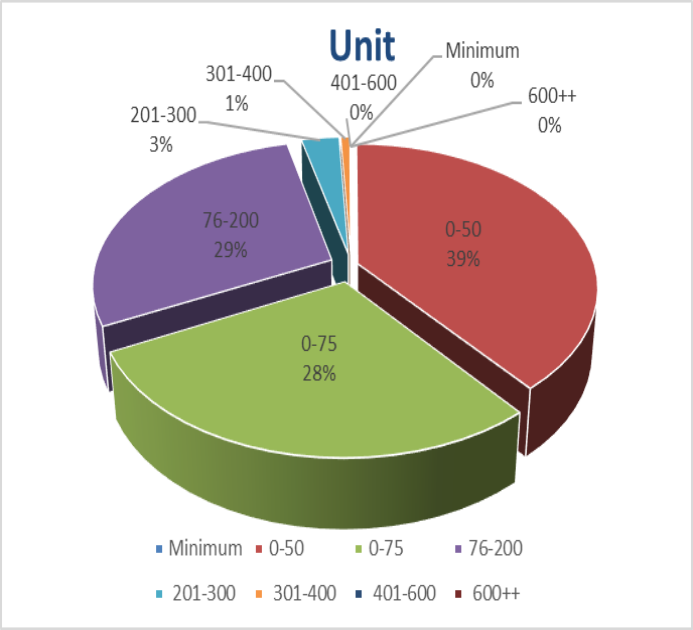


Fig 5.1.2: Domestic Unit and Consumer on December, 2017



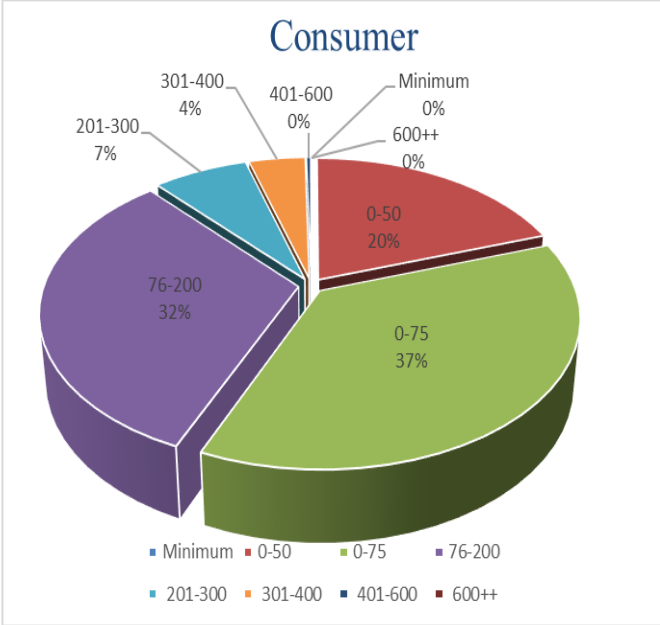


Fig 5.1.3: Domestic Unit and Consumer on May, 2018

The above graph express about number of consumer of domestic slab for different seasons. The Number of consumer varies season to season from upper slab to lower slab and lower slab to upper slab. There eight types of consumer in domestic slab such as, Minimum, 0-50 KWh, 0-75 KWh, 76-200 KWh, 201-300 KWh, 301-400 KWh, 401-600 KWh and 600++ KWh.

In Fig 5.1.1, energy consumption is 13% for 0-50 KWh with 21% consumer, 0-75 KWh consume 33% of energy with 37% consumer which is the highest percentage of consumer of the graph, 76-200 consume 36% of energy with 24% consumer, 201-300 KWh consume 12% of energy with 4% consumer, 301-400 KWh consume 4% energy with 1% consumer, Minimum slab consume2% with 12% consumer and both 600++ consumer and consume energy are about to0%. In summer season, consumer increases in higher consumed slabs due to more use of electrical appliance. In Fig5.1.2, energy consumption is 24% for 0-50 KWh slab with 29% consumer, 0-75 KWh slab consume 36% with 28% consumer which is the highest percentage of the unit of the graph, Minimum consumer is 0%; consume 0% energy and both 600++ consumer and energy consume are about to 0 %. In winter season, consumer goes down into lower slabs due to less use of electrical appliance like AC, fan, refrigerator etc. In Fig 5.1.3, the number of consumer is 20% consume 39% energy for 0-50 KWh which is highest percentage of consume energy in the Figure. 0-75 KWh consumer is 28% consume 37% of energy, Minimum consumer is 0 % consume 0% energy and both 600++ consumer and energy consume is still about 0 %.

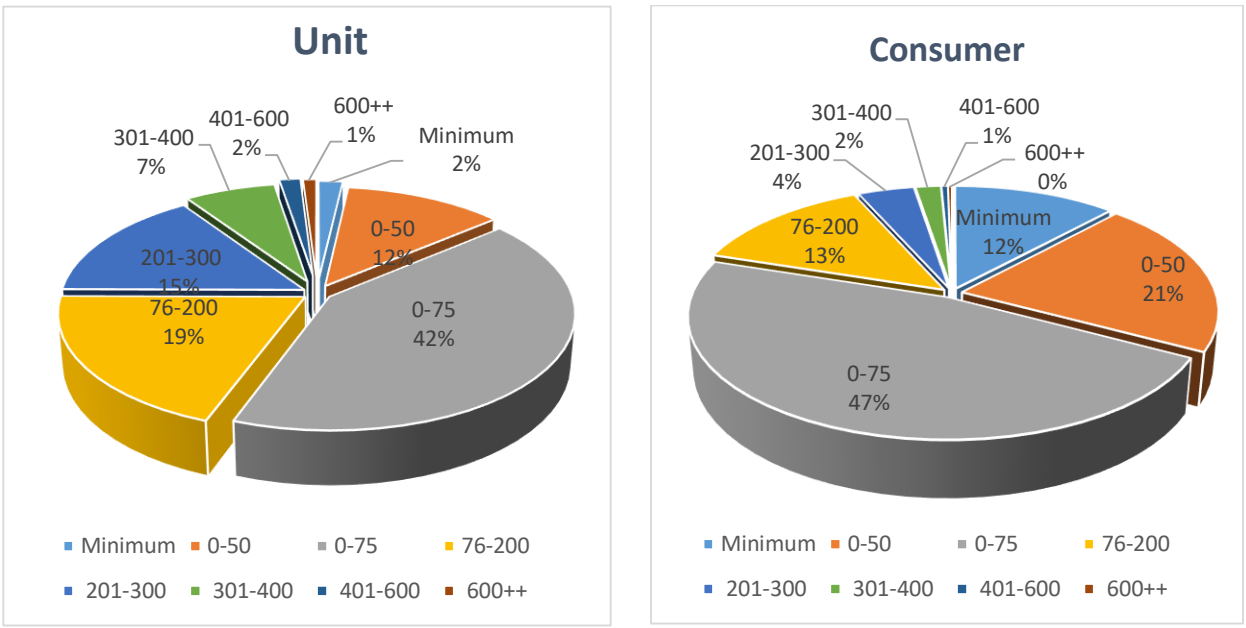


Fig 5.2.1: Domestic Unit and Consumer on July, 2016

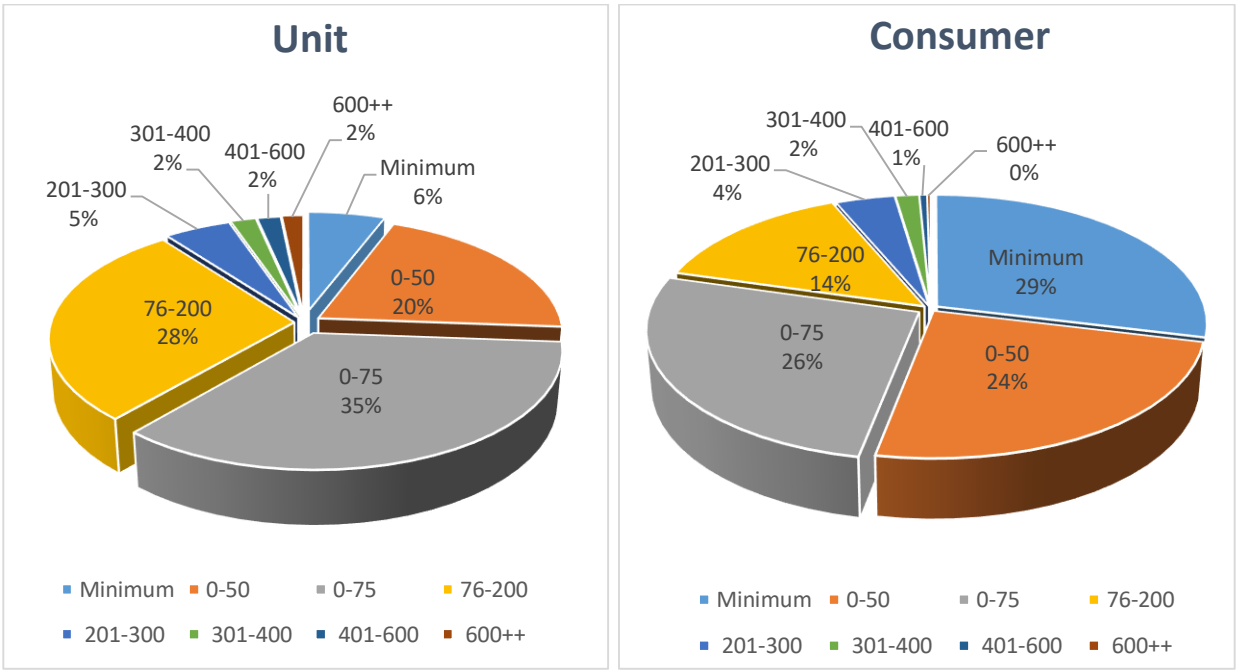


Fig 5.2.2: Domestic Unit and Consumer on December, 2016

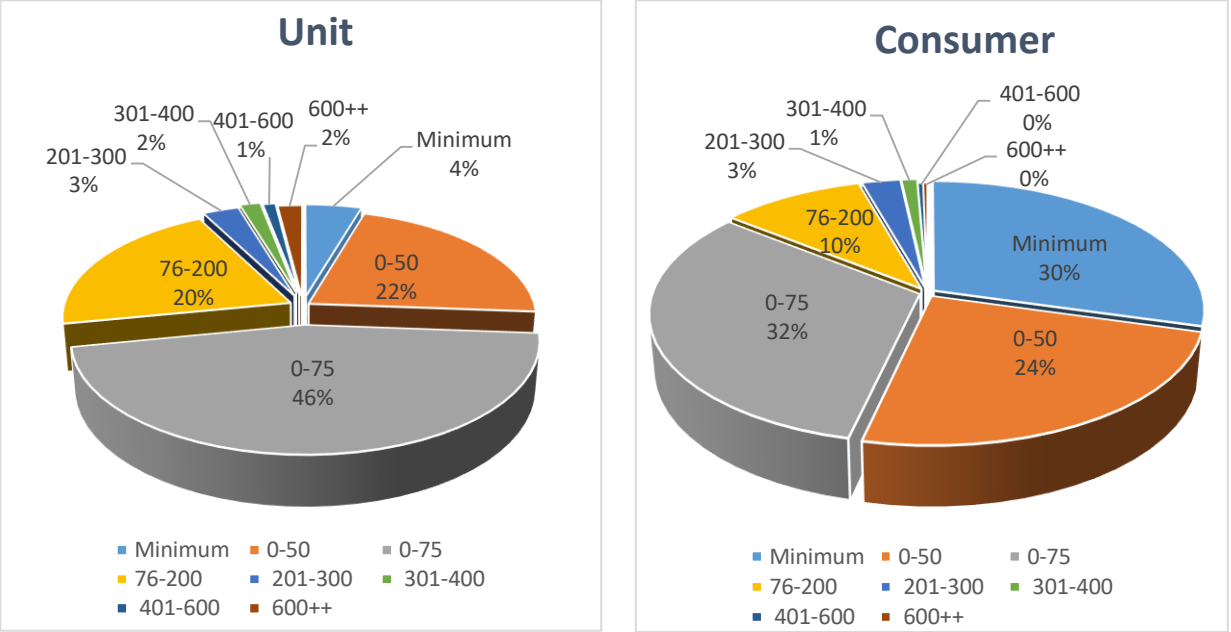


Fig 5.2.3: Domestic Unit and Consumer on May, 2017

In Fig 5.2.1, energy consumption is 12% for 0-50 KWh with 21% consumer, 0-75 KWh consume 42% of energy with 47% consumer which is the highest percentage of consumer of the graph, 76-200 consume 19% of energy with 13% consumer, 201-300 KWh consume 15% of energy with 4% consumer, 301-400 KWh consume 2% energy with 7% consumer, Minimum slab consume 2% with 12% consumer and 600++ consumer 0% and consume energy is 1%. In summer season, consumer increases in higher consumed slabs due to more use of electrical appliance. In Fig5.2.2, energy consumption is 20% for 0-50 KWh slab with 24% consumer, 0-75 KWh slab consume 35% with 26% consumer which is the highest percentage of the unit of the graph, Minimum consumer is 29%; consume 6% energy and 600++ consumer 0% and energy consume 2%. In winter season, consumer goes down into lower slabs due to less use of electrical appliance like AC, fan, refrigerator etc. In Fig 5.3, the number of consumer is 24% consume 22% energy for 0-50 KWh which is highest percentage of consume energy in the Figure. 0-75 KWh consumer is 32% consume 46% of energy, Minimum consumer is 30 %, consume 4% energy and both 600++ consumer 0% and energy consume is still about 2%.

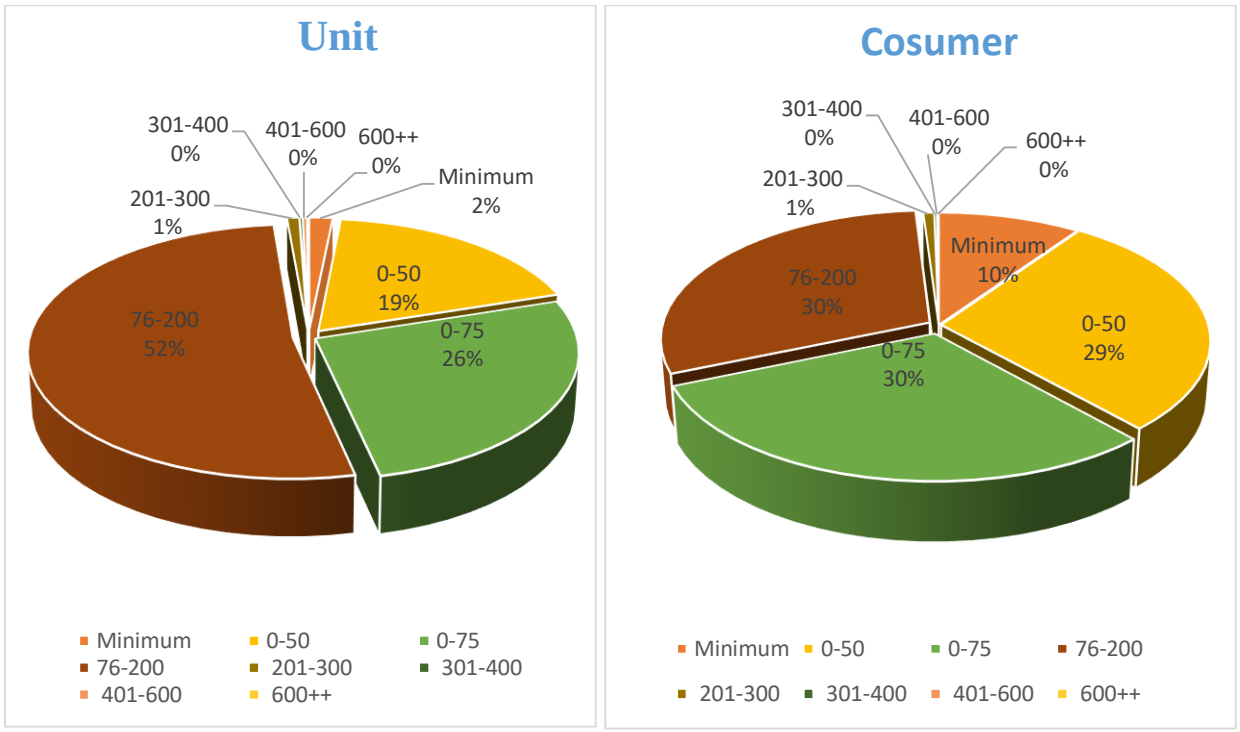


Fig 5.3.1: Domestic Unit and Consumer on July, 2015

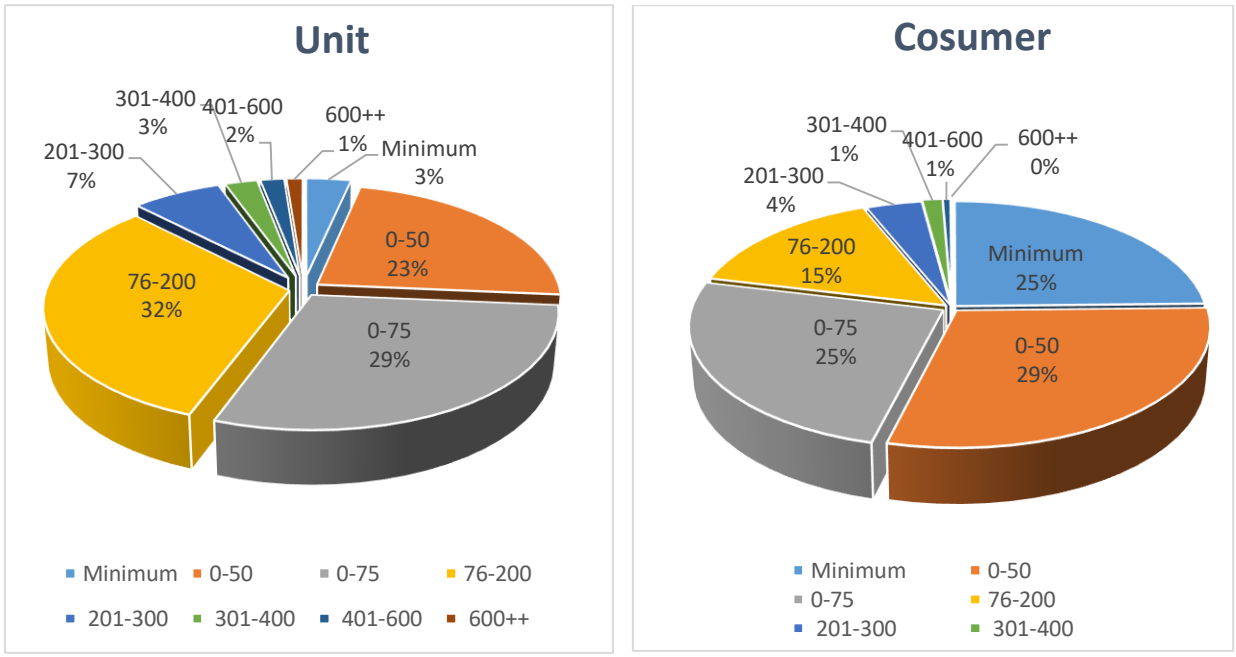


Fig 5.3.2: Domestic Unit and Consumer on December, 2015

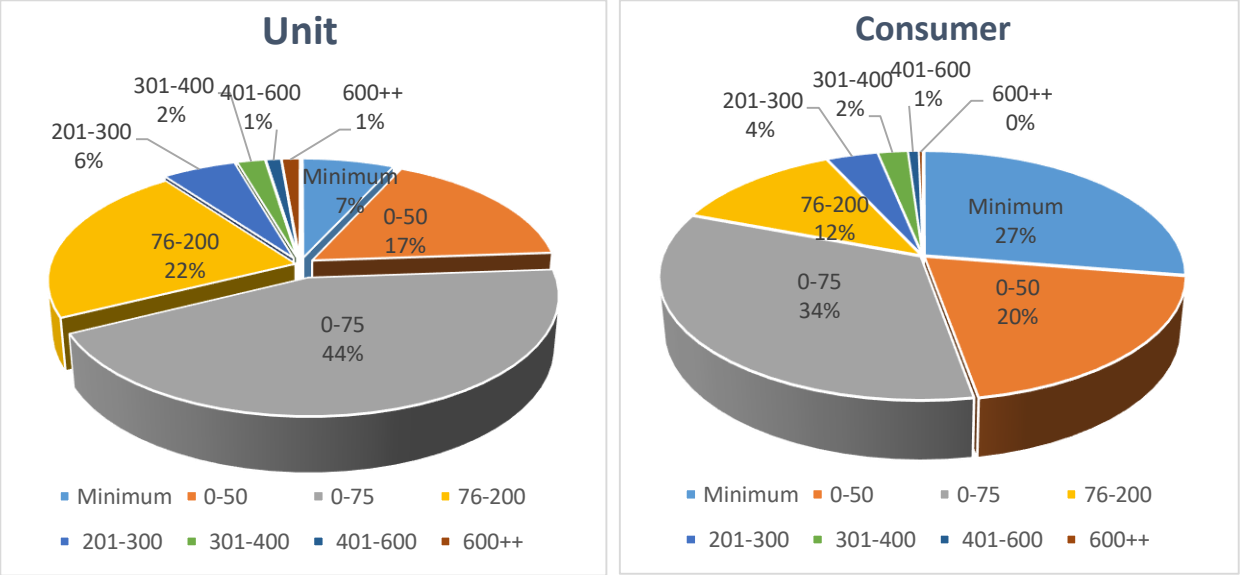


Fig 5.3.3: Domestic Unit and Consumer on May, 2016

In Fig 5.3.1, energy consumption is 19% for 0-50 KWh with 29% consumer, 0-75 KWh consume 29% of energy with 25% consumer, 76-200 consume of energy and consumer which is the largest percentage of the graph, 201-300 KWh consume of energy and consumer both are 1%, 301-400 KWh consume energy and consumer are 0%, Minimum slab consume 2% with 10% consumer and both 600++ consumer and consume energy are about to 0%. In summer season, consumer increases in higher consumed slabs due to more use of electrical appliance. In Fig5.3.2, energy consumption is 23% for 0-50 KWh slab with 29% consumer, 0-75 KWh slab consume 29% with 25% consumer which is the highest percentage of the unit of the graph, Minimum consumer is 25%; consume 3% energy and both 600++ consumer and energy consume are about to 0 %. In winter season, consumer goes down into lower slabs due to less use of electrical appliance like AC, fan, refrigerator etc. In Fig 5.3.3, the number of consumer is 17% consume 20% energy for 0-50 KWh, 0-75 KWh consumer is 34% consume 44% of energy which is the highest percentage energy consume in the figure, Minimum consumer is 27%, consume 7% energy and 600++ consumer is 0% and energy consume is still about 0 %.

5.5 Comparison of Total, Domestic, Lifeline and Minimum Consumer

Table 5.2: Total Unit, Revenue and Consumer, 2017-2018

Month	Total		
	Unit	Revenue	Consumer
July	21746645	120551419	231555
August	21807687	121213710	234274
September	23911301	130630909	238243
October	21438123	118021536	241724
November	18336229	103758041	246259
December	16854265	121213710	234274
January	18847957	105890182	253772
February	21125653	112743636	258443
March	22324596	117894584	262681
April	19752376	109034292	267532
May	17260910	101234661	274689
June	20112191	116999233	281184

Table 5.2.1: Compare Domestic with Total Domestic and Lifeline (0-50), Minimum and 0-75 Slab with Domestic, 2017-18

Month	Domestic Compare with Total					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	16862968	77.54	82499187	68.43	203962	88.08
August	16609401	76.16	80936321	66.77	206723	88.24
September	18826706	78.74	91741255	70.23	210539	88.37
October	16168574	75.42	78464179	66.48	213899	88.49
November	13484221	73.54	66967105	64.54	218294	88.64
December	11655979	69.03	59503187	59.61	221553	88.77
January	11383071	60.39	56165876	53.04	224807	88.59
February	10849843	51.36	53756505	47.68	228722	88.50
March	10823358	48.48	53596799	45.46	232743	88.60
April	11802409	59.75	58319354	53.49	237301	88.70
May	12218714	70.79	60171315	59.44	244241	88.92
June	13856437	68.90	67929994	58.06	250619	89.13

Month	Lifetime compare with domestic					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	2160827	9.94	9401759	7.80	43303	18.70
August	2163375	9.92	9411569	7.76	43303	18.48
September	2726513	11.4	11910075	9.12	56520	23.72
October	2461224	11.48	10749887	9.11	50967	21.08
November	1947228	10.62	8752728	8.44	50236	20.40
December	2771849	16.42	12266569	12.29	63798	25.56
January	3920929	20.80	17023477	16.08	77116	30.39
February	3952929	18.71	17396677	15.43	87116	33.71
March	3932728	17.62	17318903	14.69	87116	33.16
April	3885928	19.67	16413723	15.05	58116	21.72
May	4783519	27.71	19619448	19.38	48116	17.52
June	4104175	20.41	17253850	14.75	58111	20.67

Month	Minimum compare with domestic					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	356526	1.64	2229210	1.85	24769	10.70
August	370226	1.70	2238930	1.85	24877	10.62
September	290225	1.21	1789380	1.37	19882	8.35
October	280475	1.31	2476710	2.10	27519	11.38
November	238434	1.30	4479660	4.32	49774	20.21
December	0.00	0.00	0.00	0.00	0.00	0.00
January	0.00	0.00	0.00	0.00	0.00	0.00
February	0.00	0.00	0.00	0.00	0.00	0.00
March	0.00	0.00	0.00	0.00	0.00	0.00
April	0.00	0.00	0.00	0.00	0.00	0.00
May	0.00	0.00	0.00	0.00	0.00	0.00
June	0.00	0.00	0.00	0.00	0.00	0.00

Month	Slab 0-75 compare with domestic					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	5641430	25.94	23318984	19.34	75262	32.50
August	5694400	26.11	23537095	19.42	75935	32.41
September	6138968	25.67	25501653	19.52	86943	36.49
October	6419698	29.95	26563202	22.51	86734	35.88
November	7020061	38.29	28849132	27.80	86916	35.29
December	4215968	24.97	18405272	18.44	61656	24.70
January	3822528	20.28	17183012	16.23	75716	29.84
February	3446638	16.31	15929452	14.13	85716	33.17
March	3556749	15.93	16470421	13.97	89737	34.16
April	4580829	23.19	20566741	18.86	89737	33.54
May	3481625	20.17	16169925	15.97	89737	32.67
June	5413254	26.92	23466666	20.06	72546	25.80

Firstly, we compare between the number of consumer, energy consumption and revenue with total and domestic according to total. The percentage of energy consumption shown in domestic, are as usually low during winter season. It's also clear that domestics consume above 73.54% of total energy in JPBS. Where revenue shows 64.54% and number of consumer above 88.64% in average of their total. We also compare the Lifeline, Minimum and 0-75 slabs with the Domestic

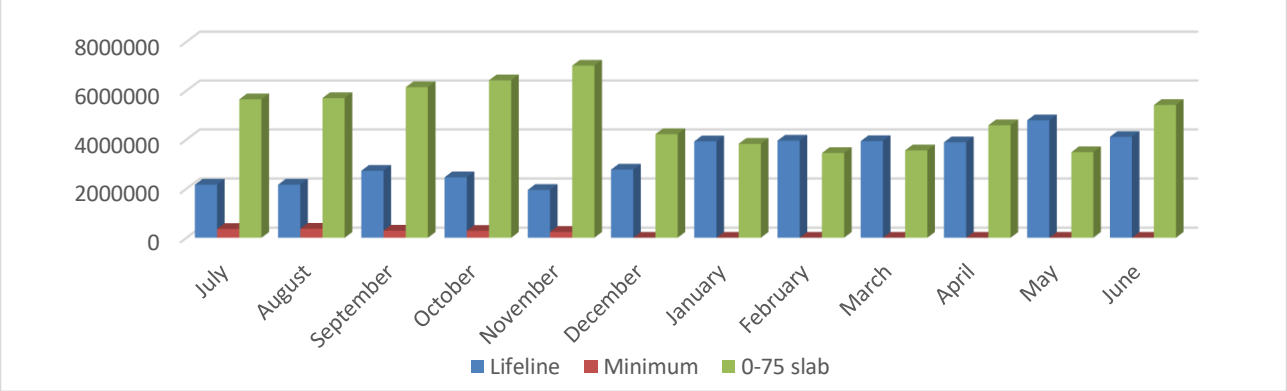


Fig 5.4.1: Monthly Unit Consumption of Lifeline, Minimum and 0-75 Slab (2017-2018)

The graph shows monthly unit consumption of Lifeline, Minimum and 0-75 slab in 2017-2018 of JPBS. There are several features in this graph. In November 2017, 0-75 slab, August 2017 and May 2018, Lifeline are the highest unit consumption than the other months of this graph. From December 2017 to June 2018, Minimum unit consumption are zero.

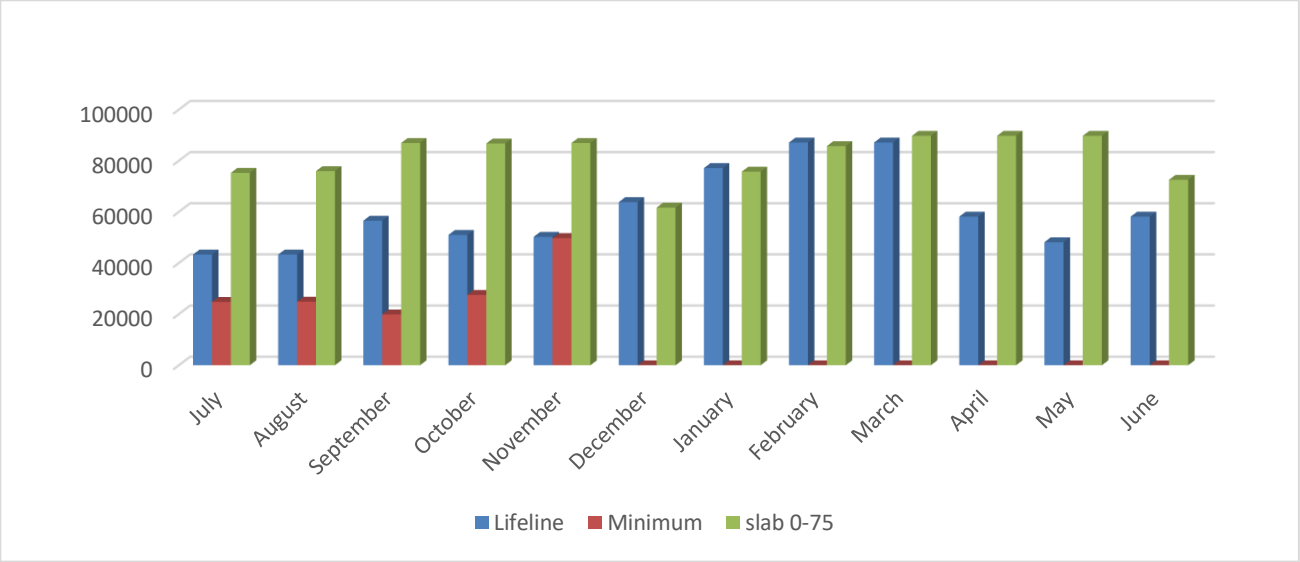


Fig 5.4.2: Month wise Consumers of Lifeline, Minimum and 0-75 Slab (2017-2018)

Compare with Fig 5.4.1 and Fig 5.4.2 Lifeline consumer consume small amount of energy but sometime their amount was high. From fig. 5.4.2, Lifeline consumers are high in February 2018 & March 2018 and they are the same amount. In November 2017 Minimum consumers and March, April & May 2018 Slab 0-75 are higher than the other months. Minimum consumers are zero in December 2017 to June 2018.

Table 5.3: Total Unit, Revenue and Consumer, 2016-2017

Month	Total		
	Unit	Revenue	Consumer
July	18828400	105814126	190817
August	18404886	106089047	195368
September	17962826	100884591	200013
October	17499993	98167123	205261
November	16559777	94572744	208245
December	15172497	88960009	211349
January	18475167	100478608	215732
February	19092109	100428744	220341
March	19735649	104295364	222992
April	16766993	93281729	224891
May	14869645	87141626	226573
June	17610497	99735966	228242

Table 5.3.1: Compare Domestic with Total Domestic and Lifeline (0-50), Minimum and 0-75 Slab with Domestic

Month	Domestic compare with total					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	13935465	74.01	68185015	64.44	165665	86.82
August	12586731	68.39	64181507	60.50	170038	87.03
September	12443963	69.28	61540469	61.00	174418	87.20
October	12180012	69.60	59633167	60.75	179355	87.38
November	11416569	68.94	57108337	60.39	182151	87.47
December	9853882	64.95	50150732	56.37	185219	87.64
January	10486765	56.76	53145141	52.89	188637	87.44
February	8792430	46.05	45830328	45.63	192415	87.33
March	8936652	45.28	46908478	44.98	194821	87.37
April	9919213	59.16	50946415	54.62	196562	87.40
May	10100729	67.93	50770494	58.26	198217	87.48
June	12124609	68.85	59367169	59.52	200137	87.67

Month	Lifeline compare with domestic					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	1675890	8.90	7316177	6.91	34560	18.11
August	1498866	8.14	6529209	6.15	30343	15.53
September	1743572	9.71	7594227	7.53	35259	17.63
October	1801911	10.30	7864557	8.01	37088	18.07
November	2003975	12.10	8727929	9.23	40505	19.45
December	2002475	13.20	8830779	9.93	44850	21.22
January	2524990	13.67	11070612	11.02	53976	25.02
February	2285270	11.97	10174615	10.37	55053	24.99
March	1813840	9.19	7976684	7.65	39736	17.82
April	1963025	11.71	8601946	9.22	41772	18.57
May	2184120	14.69	9608037	11.03	47967	21.17
June	2374470	13.48	10335335	10.36	47745	20.92

Month	Minimum compare with domestic					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	253260	1.35	1772640	1.68	19696	10.32
August	222702	1.21	2201760	2.08	24464	12.52
September	393023	2.19	2426850	2.41	26965	13.48
October	431646	2.47	2889810	2.94	32109	15.64
November	614864	3.71	3772710	3.99	41919	20.13
December	575391	3.79	4803210	5.40	53369	25.25
January	512397	2.77	4484790	4.46	49831	23.10
February	688460	3.61	6392520	6.37	71028	32.24
March	531212	2.69	6590340	6.32	73226	32.84
April	456730	2.72	5856660	6.28	65074	28.94
May	458146	3.08	5244660	6.02	58274	25.72
June	515196	2.93	3956310	3.97	43959	19.26

Month	0-75 KWH compare with domestic					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	5825790	30.94	24094110	22.77	78242	41.00
August	4406960	23.94	18235742	17.19	59570	30.49
September	3695427	20.57	15277985	15.14	49413	24.70
October	5032629	28.76	20837266	21.23	68529	33.39
November	4293975	25.93	17749373	18.77	57289	27.51
December	3469915	22.87	14409187	16.20	48939	23.16
January	3901768	21.12	16142493	16.07	52631	24.40
February	2950340	15.45	12209742	12.16	39938	18.13
March	3879875	19.66	16058750	15.40	52609	23.59
April	3904084	23.28	16166044	17.33	53221	23.67
May	4620733	31.07	19148185	21.97	63576	28.06
June	4290170	24.36	17741771	17.79	57565	25.22

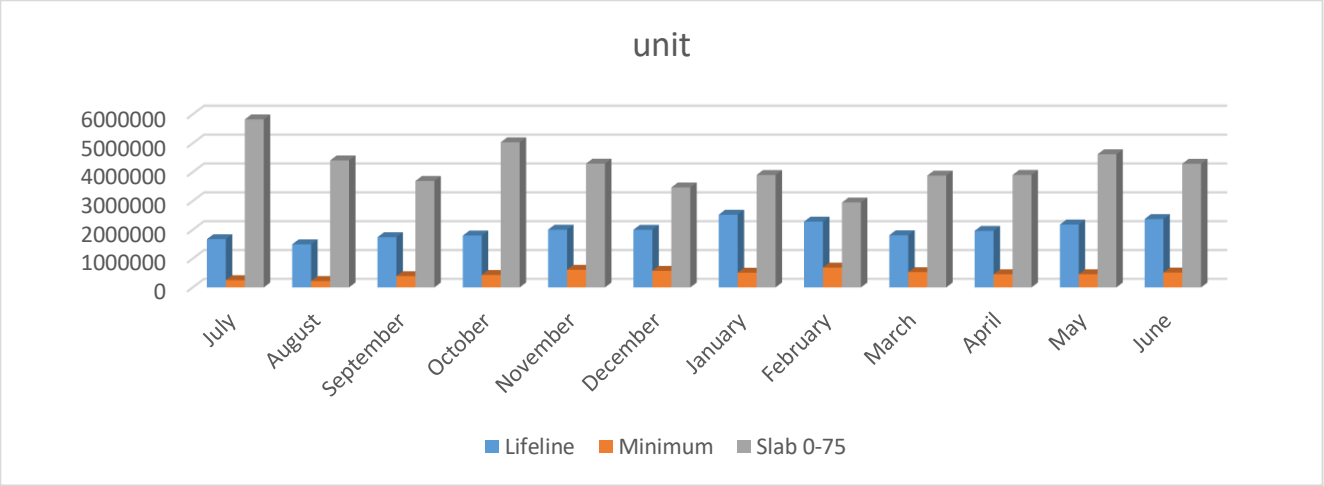


Fig 5.5.1: Monthly Unit Consumption of Lifeline, Minimum and 0-75 Slab (2016-2017)

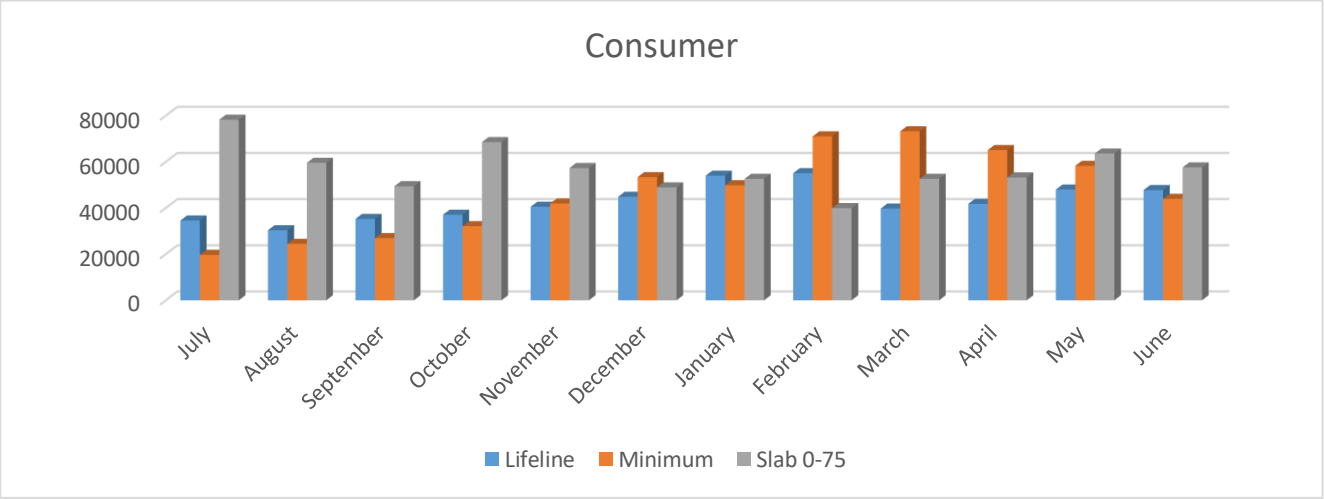


Fig 5.5.2: Month wise Consumers of Lifeline, Minimum and 0-75 Slab (2016-2017)

The graph 5.5.1 shows monthly unit consumption of Lifeline, Minimum and 0-75 slab in 2017-2018 of JPBS. In July 2017, 0-75 slab, November 2016 Minimum are the high unit consumption than the other months. In January 2016, Lifeline unit consumption is high. Minimum unit consumption is large in March 2017 and low in July 2016.

The bar chart 5.5.2 shows that Lifeline consumers is higher in July 2016 than the other months. In November 2016 Minimum consumers and March, April & May 2018 Slab 0-75 are higher than the other months. Minimum consumers are zero in December 2017 to June 2017.

Table 5.4: Total Unit, Revenue and Consumer, 2015-2016

Month	Total		
	Unit	Revenue	Consumer
July	15179708	84267217	142089
August	16807047	93322262	145452
September	16436764	91641520	149240
October	17153556	95530502	155881
November	13825866	80543776	158578
December	13016327	76112084	162363
January	15845728	85802603	167473
February	18949284	97392511	171257
March	19273675	98048042	175648
April	17297696	90947384	180187
May	14302397	81569105	185368
June	15928757	90510157	188037

Table 5.4.1: Compare Domestic with Total Domestic and Lifeline (0-50), Minimum and 0-75 Slab with Domestic

Month	Domestic compare with total					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	10275321	67.69	49228009	58.42	118301	83.26
August	11712410	69.69	56918346	60.99	121652	83.64
September	11255091	68.48	54456763	59.42	125497	84.09
October	12065131	70.34	58893380	61.65	131948	84.65
November	9217694	66.67	46106439	57.24	134595	84.88
December	8079258	62.07	40482574	53.19	138516	85.31
January	8098683	51.11	40252932	46.91	142741	85.23
February	7879559	41.58	39150108	40.20	145675	85.06
March	7302859	37.89	36622848	37.35	149680	85.22
April	7955336	45.99	39279587	43.19	153934	85.43
May	8889679	62.16	43323773	53.11	158911	85.73
June	11080435	69.56	54316767	60.01	162577	86.46

Month	Lifeline compare with total					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	1897855	12.50	8154568	9.68	33913	23.87
August	1584112	9.43	6949157	7.45	34013	23.38
September	2787142	16.96	11746997	12.82	40655	27.24
October	2992142	17.44	12511133	13.10	39655	25.44
November	1592255	11.52	6098488	7.57	31851	20.09
December	1855678	14.26	7192832	9.45	40537	24.97
January	1849848	11.67	7166347	8.35	40254	24.04
February	1786989	9.43	6924526	7.11	38954	22.75
March	1492552	7.74	5733100	5.85	30516	17.37
April	1643685	9.50	6333449	6.96	34399	19.09
May	1513813	10.58	6609355	8.10	31247	16.86
June	1651465	10.37	7211465	7.97	34133	18.15

Month	Minimum compare with domestic					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	163682	1.08	1027710	1.22	11419	8.04
August	158771	0.94	953820	1.02	10598	7.29
September	192924	1.17	1109070	1.21	12323	8.26
October	190764	1.11	1186200	1.24	13180	8.46
November	399240	2.89	2412540	3.00	26806	16.90
December	275446	2.12	3073680	4.04	34152	21.03
January	435343	2.75	3229020	3.76	35878	21.42
February	588563	3.11	3812760	3.91	42364	24.74
March	515858	2.68	4651740	4.74	51686	29.43
April	685184	3.96	4416390	4.86	49071	27.23
May	611206	4.27	3937860	4.83	43754	23.60
June	445770	2.80	2728890	3.02	30321	16.13

Month	0-75 KVH compare with domestic					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	2716554	17.90	11410089	13.54	35881	25.25
August	3878812	23.08	15953027	17.09	37681	25.91
September	3523793	21.44	14404070	15.72	40535	27.16
October	3308793	19.29	13561821	14.20	39535	25.36
November	3071264	22.21	12694709	15.76	40955	25.83
December	2365828	18.18	9851895	12.94	34469	21.23
January	2159418	13.63	9054785	10.55	33959	20.28
February	1959222	10.34	8213288	8.43	30729	17.94
March	2326238	12.07	9667978	9.86	33130	18.86
April	2746952	15.88	11386595	12.52	37926	21.05
May	3892456	27.22	16125772	19.77	53376	28.79
June	5031240	31.59	20796787	22.98	67121	35.70

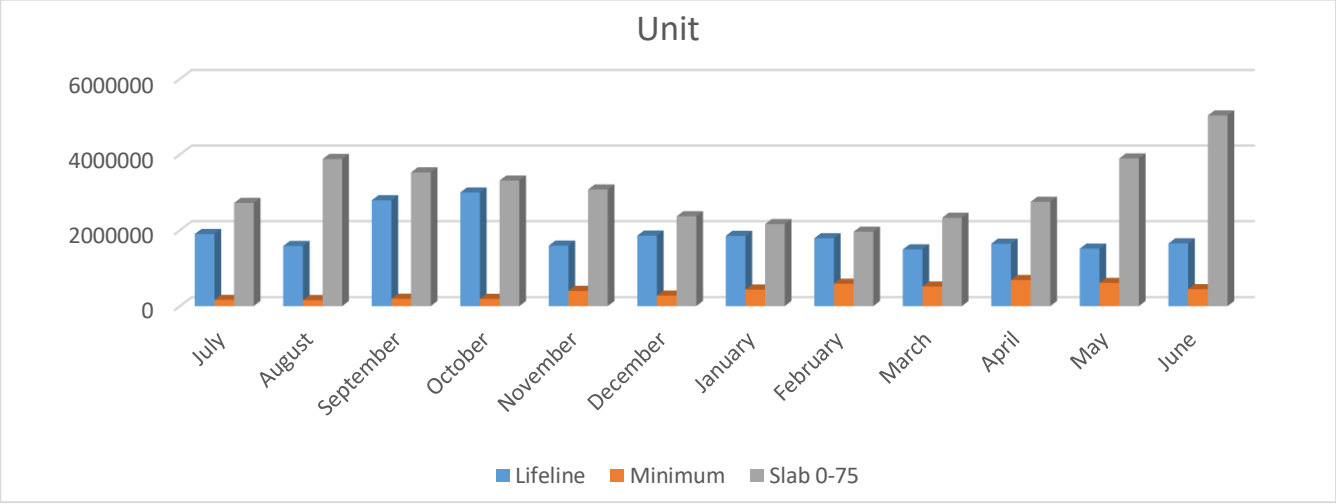


Fig 5.6.1: Monthly Unit Consumption of Lifeline, Minimum and 0-75 Slab (2015-2016)

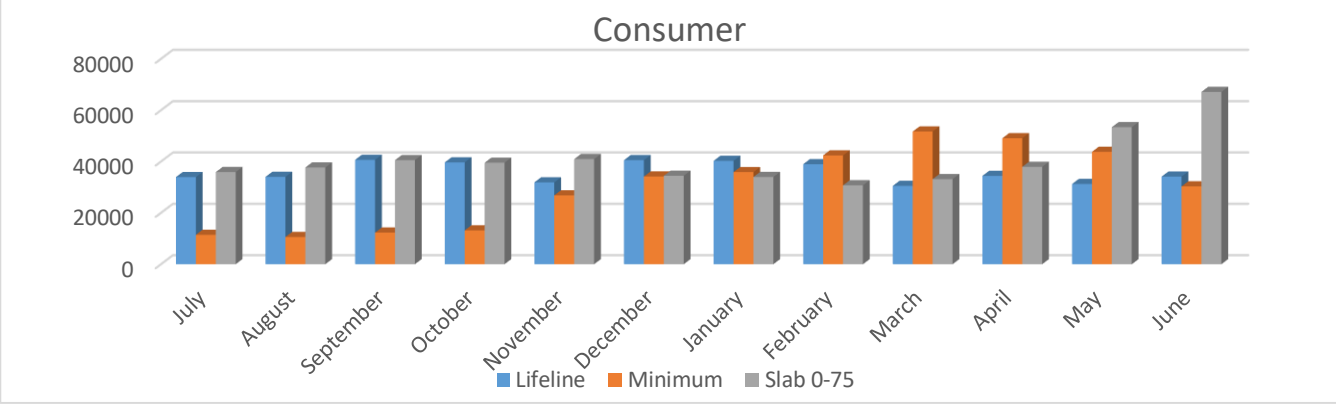


Fig 5.6.2: Month wise Consumers of Lifeline, Minimum and 0-75 Slab (2015-2016)

Graph 5.6.1 shows the lifeline, minimum and 0-75 slab monthly unit costs for JPBS in 2015-2016. This graph contains several features. October 2015, Lifeline unit consumption is higher than in the other months. 0-75 Slab in June 2016 unit consumption is more. In July & August 2015, Minimum unit consumption are lower than in the others months.

The 5.6.2 bar chart shows that Slab 0-75 in June 2016 and Minimum unit consumption in March 2016 are larger than in other months. Lifeline unit consumption in September, October, December 2015 & January, February 2016 are quite the same.

5.6 Comparison of Total, Commercial, Charitable Institution, Irrigation, General Power, Large Power, 33 KV and Street Lights

From analysis of comparison between Total with Commercial, Charitable Institution, Irrigation, General Power, Large Power, 33 KV and Street Lights.

Table 5.5.1: Commercial, Charitable Institution, Irrigation, General Power, Large Power, 33 KV and Street Lights compare with Total (2017-2018).

	Commercial					
Month	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	1594637	7.33	16235431	13.47	12355	5.34
August	1576478	7.23	16034642	13.23	12374	5.28
September	1692906	7.08	17207244	13.17	12496	5.25
October	1530259	7.14	15624234	13.24	12596	5.21
November	1431798	7.81	14656359	14.13	12737	5.17
December	1364237	8.08	14560747	14.59	12896	5.17
January	1332267	7.07	14255210	13.46	13038	5.14
February	1258385	5.96	13418425	11.90	13177	5.10
March	1296023	5.81	13892092	11.78	13225	5.03
April	1456427	7.37	15607990	14.31	13355	4.99
May	1451576	8.41	15515405	15.33	13485	4.91
June	1697677	8.44	18048685	15.43	13712	4.88

Month	Charitable					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	347398	1.60	1969931	1.63	3734	1.61
August	381411	1.75	2146136	1.77	3745	1.60
September	371798	1.55	2105443	1.61	3806	1.60
October	358598	1.67	2035931	1.73	3848	1.59
November	296990	1.62	1727007	1.66	3889	1.58
December	215378	1.28	1352432	1.35	3942	1.58
January	188942	1.00	1194027	1.13	3962	1.56
February	183344	0.87	1167422	1.04	4008	1.55
March	205744	0.92	1296243	1.10	4034	1.54
April	281136	1.42	1730248	1.59	4064	1.52
May	289956	1.68	1782700	1.76	4129	1.50
June	316672	1.57	1934488	1.65	4176	1.49

Month	Irrigation					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	1096073	5.04	4695180	3.89	9555	4.13
August	1130925	5.19	4780221	3.94	9476	4.04
September	1307983	5.47	5330378	4.08	9446	3.96
October	1451449	6.77	5993110	5.08	9410	3.89
November	1357484	7.40	5676067	5.47	9371	3.81
December	1699090	10.06	7457756	7.47	9245	3.70
January	3828337	20.31	16028889	15.14	9994	3.94
February	7066652	33.45	28980506	25.70	10556	4.08
March	8232007	36.87	33621057	28.52	10711	4.08
April	4605816	23.32	19214087	17.62	10839	4.05
May	1255198	7.27	5752582	5.68	10845	3.95
June	1862612	9.26	8110717	6.93	10678	3.80

Month	General Power					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	1030916	4.74	8448421	7.01	1791	0.77
August	1108817	5.08	9105256	7.51	1795	0.77
September	962867	4.03	7955329	6.09	1794	0.75
October	962891	4.49	7893628	6.69	1809	0.75
November	833376	4.54	7027073	6.77	1809	0.73
December	1113197	6.59	9504387	9.52	1791	0.72
January	1141399	6.06	9690785	9.15	1809	0.71
February	956636	4.53	8190062	7.26	1818	0.70
March	1023714	4.59	8789935	7.46	1808	0.69
April	881623	4.46	7628298	7.00	1811	0.68
May	1056367	6.12	9118953	9.01	1823	0.66
June	1338696	6.66	11388995	9.73	1830	0.65

Month	Large Power					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	511354	2.35	4420781	3.67	113	0.05
August	644540	2.96	5536233	4.57	116	0.05
September	468930	1.96	4183266	3.20	117	0.05
October	511247	2.38	4593275	3.89	119	0.05
November	484475	2.64	4341704	4.18	116	0.05
December	420754	2.49	3977533	3.98	117	0.05
January	520755	2.76	4792059	4.53	115	0.05
February	407636	1.93	3871665	3.43	114	0.04
March	423672	1.90	3973861	3.37	112	0.04
April	363392	1.84	3495764	3.21	114	0.04
May	686345	3.98	6334503	6.26	118	0.04
June	728747	3.62	6815146	5.82	121	0.04

Month	33 KV					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	289254	1.33	2176612	1.81	2	0.00
August	340890	1.56	2563366	2.11	2	0.00
September	267276	1.12	2011997	1.54	2	0.00
October	436420	2.04	3278886	2.78	2	0.00
November	434605	2.37	3265291	3.15	2	0.00
December	397834	2.36	3318063	3.32	2	0.00
January	428558	2.27	3570654	3.37	2	0.00
February	375901	1.78	3145531	2.79	2	0.00
March	299318	1.34	2561095	2.17	2	0.00
April	345903	1.75	2914243	2.67	2	0.00
May	287321	1.66	2436718	2.41	2	0.00
June	284433	1.41	2560299	2.19	2	0.00

Month	Street Light					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	14045	0.06	105876	0.09	43	0.02
August	15225	0.07	111535	0.09	43	0.02
September	12835	0.05	95997	0.07	43	0.02
October	18685	0.09	138293	0.12	41	0.02
November	13280	0.07	97435	0.09	41	0.02
December	18320	0.11	144352	0.14	44	0.02
January	24628	0.13	192682	0.18	45	0.02
February	27256	0.13	213520	0.19	46	0.02
March	20760	0.09	163502	0.14	46	0.02
April	15670	0.08	124308	0.11	46	0.02
May	15433	0.09	122485	0.12	46	0.02
June	26917	0.13	210909	0.18	46	0.02

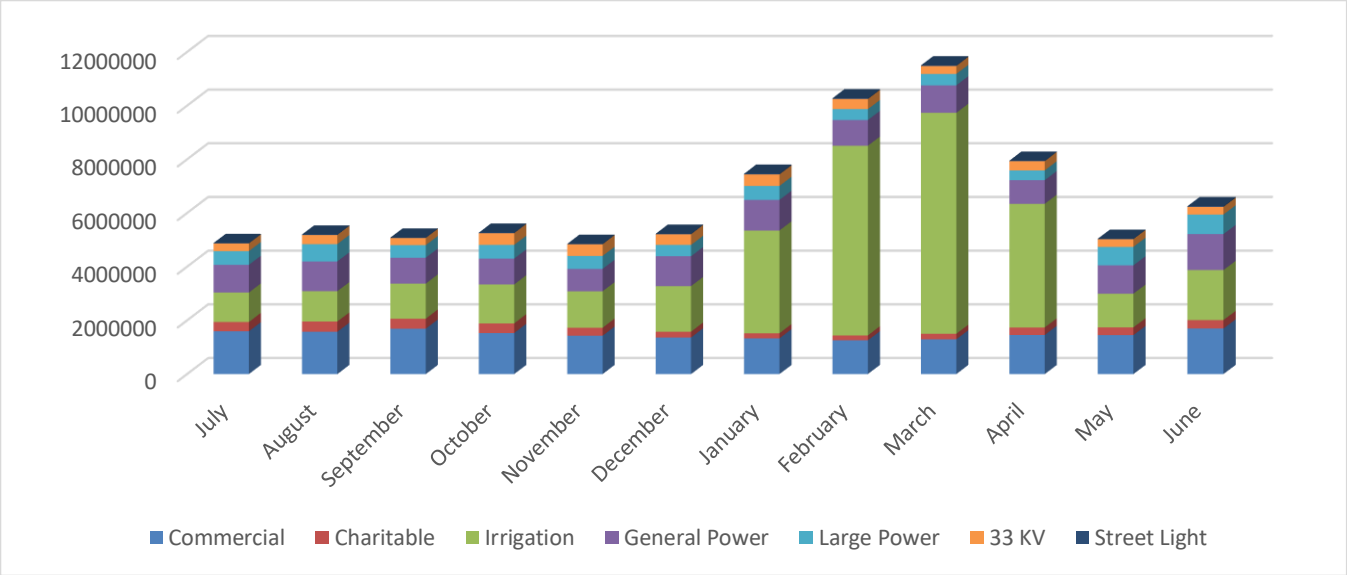


Fig 5.7.1: Monthly Unit Consumption of other Slabs of Jamalpur PBS (2017-18)

In Fig 5.7.1, monthly energy consumption of the slabs except Domestic are described. Nothing is abnormal in there. Irrigation slab consume more energy from February to April than the other months. Consumption of Charitable Institutions and General Power are regular. Consumption of Commercial and Large Power are increased. JPBS has very little amount of Street Light energy consumer which is shown in the Figure.

Table 5.5.2: Commercial, Charitable Institution, Irrigation, General Power, Large Power, 33 KV and Street Lights compare with Total of JPBS (2016-2017)

Month	Commercial					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	1556535	8.27	15760548	14.89	11037	5.78
August	1465957	7.97	14954924	14.10	11261	5.76
September	1435428	7.99	14544046	14.42	11407	5.70
October	1427777	8.16	14534737	14.81	11593	5.65
November	1418538	8.57	14482212	15.31	11727	5.63
December	1270169	8.37	13060276	14.68	11812	5.59
January	1269121	6.87	13051534	12.99	11919	5.52
February	1062377	5.56	11047380	11.00	12067	5.48
March	1127905	5.72	11693148	11.21	12137	5.44
April	1181910	7.05	12202236	13.08	12206	5.43
May	1184669	7.97	12212317	14.01	12234	5.40
June	1385562	7.87	14196191	14.23	12266	5.37

Month	Charitable					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	326320	1.73	1831056	1.73	3238	1.70
August	299624	1.63	1713148	1.61	3251	1.66
September	292918	1.63	1669160	1.65	3304	1.65
October	289968	1.66	1659659	1.69	3366	1.64
November	276114	1.67	1592790	1.68	3397	1.63
December	194754	1.28	1196460	1.34	3433	1.62
January	199953	1.08	1231917	1.23	3483	1.61
February	174226	0.91	1109832	1.11	3513	1.59
March	186637	0.95	1180024	1.13	3548	1.59
April	241025	1.44	1437347	1.54	3576	1.59
May	247031	1.66	1458127	1.67	3607	1.59
June	291607	1.66	1685592	1.69	3649	1.60

Month	Irrigation					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	1227700	6.52	5097016	4.82	8984	4.71
August	1921850	10.44	7799657	7.35	8917	4.56
September	1926791	10.73	7681972	7.61	8974	4.49
October	1777423	10.16	7228995	7.36	9036	4.40
November	1737740	10.49	7112397	7.52	9057	4.35
December	1744887	11.50	7140880	8.03	8969	4.24
January	4831013	26.15	18846921	18.76	9772	4.53
February	7553627	39.56	29736591	29.61	10416	4.73
March	7780200	39.42	30247238	29.00	10544	4.73
April	3952253	23.57	16198561	17.37	10600	4.71
May	1350564	9.08	6385182	7.33	10564	4.66
June	1659562	9.42	6938429	6.96	10231	4.48

Month	General Power					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	1063356	5.65	8757679	8.28	1742	0.91
August	1220117	6.63	9917225	9.35	1749	0.90
September	1159554	6.46	9500349	9.42	1758	0.88
October	1101213	6.29	9010517	9.18	1759	0.86
November	989588	5.98	8200850	8.67	1760	0.85
December	1261542	8.31	10393323	11.68	1761	0.83
January	1024367	5.54	8514171	8.47	1765	0.82
February	922082	4.83	7651506	7.62	1774	0.81
March	1044319	5.29	8636466	8.28	1785	0.80
April	982333	5.86	8146860	8.73	1789	0.80
May	1169103	7.86	9535542	10.94	1793	0.79
June	1165793	6.62	9486942	9.51	1799	0.79

Month	Large Power					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	690936	3.67	5971083	5.64	110	0.06
August	888014	4.82	7349788	6.93	111	0.06
September	681635	3.79	5775337	5.72	111	0.06
October	697425	3.99	5901430	6.01	111	0.05
November	684874	4.14	5802828	6.14	112	0.05
December	811989	5.35	6746318	7.58	111	0.05
January	416017	2.25	3831138	3.81	111	0.05
February	371626	1.95	3429509	3.41	111	0.05
March	413691	2.10	3779689	3.62	112	0.05
April	256009	1.53	2587824	2.77	112	0.05
May	582812	3.92	5011143	5.75	113	0.05
June	764768	4.34	6415050	6.43	115	0.05

Month	33 KV					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	13355	0.07	104479	0.10	1	0.00
August	12418	0.07	97458	0.09	1	0.00
September	11762	0.07	93120	0.09	1	0.00
October	13750	0.08	108006	0.11	1	0.00
November	20294	0.12	157006	0.17	1	0.00
December	17304	0.11	134617	0.15	1	0.00
January	230946	1.25	1734757	1.73	2	0.00
February	202671	1.06	1528106	1.52	2	0.00
March	229480	1.16	1728905	1.66	2	0.00
April	221109	1.32	1666206	1.79	2	0.00
May	224077	1.51	1688437	1.94	2	0.00
June	204331	1.16	1540539	1.54	2	0.00

Month	Street Light					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	14733	0.08	107250	0.10	40	0.02
August	10175	0.06	75340	0.07	40	0.02
September	10775	0.06	80138	0.08	40	0.02
October	12425	0.07	90612	0.09	40	0.02
November	16060	0.10	116324	0.12	40	0.02
December	17970	0.12	137403	0.15	43	0.02
January	16985	0.09	123029	0.12	43	0.02
February	13070	0.07	95492	0.10	43	0.02
March	16765	0.08	121416	0.12	43	0.02
April	13141	0.08	96280	0.1	44	0.02
May	10660	0.07	80384	0.09	43	0.02
June	14265	0.08	106054	0.11	43	0.02

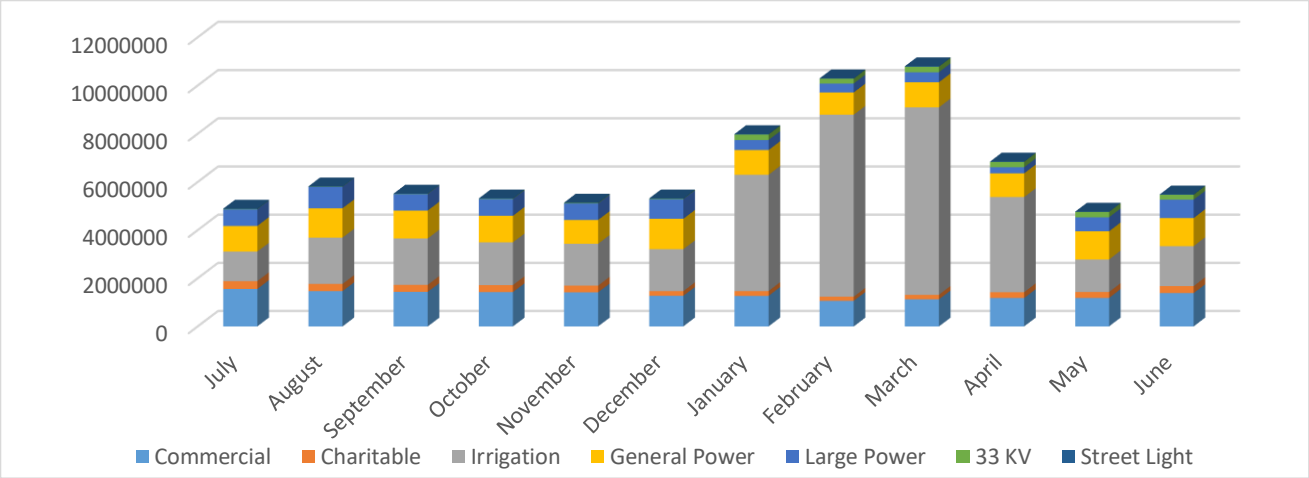


Fig 5.7.2: Monthly Unit Consumption of other Slabs of Jamalpur PBS (2016-17)

In Fig 5.7.2, monthly unit consumption of the slabs except Domestic are explained. Bar chart shows that Irrigation slabs consume more energy from January to April than other months. Consumption of Charitable Institutions and General Power are regular. Consumption of Commercial and Large Power are increased. JPBS Street Light Energy consumers have a small amount as shown in the figure.

Table 5.4.3: Commercial, Charitable Institution, Irrigation, General Power, Large Power, 33 KV and Street Lights compare with Total (2015-2016)

Month(15-16)	Commercial					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	1339424	8.82	13307056	15.79	9750	6.86
August	1353066	8.05	13429774	14.39	9809	6.74
September	1314823	8.00	13167810	14.37	9882	6.62
October	1361853	7.94	13917912	14.57	10099	6.48
November	1289863	9.33	13196101	16.38	10237	6.46
December	1123850	8.63	11538326	15.16	10300	6.34
January	1087843	6.87	11185569	13.04	10370	6.19
February	1042607	5.50	10755842	11.04	10491	6.13
March	1056582	5.48	10922999	11.14	10607	6.04
April	1139338	6.59	11717306	12.88	10781	5.98
May	1188086	8.31	12175627	14.93	10936	5.90
June	1370184	8.60	13970359	15.44	11004	5.85

Month	Charitable					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	281664	1.86	1509826	1.79	2554	1.80
August	298067	1.77	1587724	1.70	2624	1.80
September	311870	1.90	1663027	1.81	2668	1.79
October	300933	1.75	1702940	1.78	2736	1.76
November	246263	1.78	1427878	1.77	2800	1.77
December	174572	1.34	1038989	1.37	2839	1.75
January	163674	1.03	1001377	1.17	2888	1.72
February	163060	0.86	1008491	1.04	2918	1.70
March	187986	0.98	1129503	1.15	2970	1.69
April	213406	1.23	1252339	1.38	3028	1.68
May	232131	1.62	1350829	1.66	3093	1.67
June	279908	1.76	1587840	1.75	3142	1.67

Month	Irrigation					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	1592271	10.49	6654444	7.90	9581	6.74
August	1571689	9.35	6517060	6.98	9458	6.50
September	1647226	10.02	6719963	7.33	9284	6.22
October	1752226	10.21	7121260	7.45	9182	5.89
November	1426864	10.32	5874464	7.29	9034	5.70
December	1637757	12.58	6617723	8.69	8794	5.42
January	4635427	29.25	17948241	20.92	9567	5.71
February	8067935	42.58	31579926	32.43	10264	5.99
March	9010991	46.75	34972796	35.67	10485	5.97
April	6336268	36.63	24845854	27.32	10551	5.86
May	2051158	14.34	8786491	10.77	10526	5.68
June	1378653	8.66	5635186	6.23	9422	5.01

Month	General Power					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	1075336	7.08	8540398	10.13	1759	1.24
August	1087219	6.47	8596813	9.21	1766	1.21
September	1249702	7.60	10128504	11.05	1765	1.18
October	1016629	5.93	8335607	8.73	1772	1.14
November	986165	7.13	8357816	10.38	1764	1.11
December	1271575	9.77	10361434	13.61	1766	1.09
January	1161806	7.33	9499397	11.07	1758	1.05
February	1090621	5.76	8942254	9.18	1761	1.03
March	1132518	5.88	9348623	9.53	1760	1.00
April	1091281	6.31	8984713	9.88	1743	0.97
May	1271920	8.89	10257427	12.58	1752	0.95
June	1081711	6.79	8769160	9.69	1741	0.93

Month	Large Power					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	603871	3.98	4942442	5.87	105	0.07
August	772990	4.60	6187458	6.63	105	0.07
September	643358	3.91	5399384	5.89	106	0.07
October	640668	3.73	5442243	5.70	106	0.07
November	638981	4.62	5436352	6.75	110	0.07
December	708771	5.45	5924727	7.78	110	0.07
January	649651	4.10	5553181	6.47	110	0.07
February	664023	3.50	5643978	5.80	109	0.06
March	550707	2.86	4809280	4.91	107	0.06
April	482880	2.79	4311521	4.74	109	0.06
May	638324	4.46	5440450	6.67	110	0.06
June	709283	4.45	6014994	6.65	111	0.06

Month	33 KV					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	0	0.00	0	0.00	0	0.00
August	0	0.00	0	0.00	0	0.00
September	0	0.00	0	0.00	0	0.00
October	0	0.00	0	0.00	0	0.00
November	0	0.00	0	0.00	0	0.00
December	0	0.00	0	0.00	0	0.00
January	23968	0.15	183970	0.21	1	0.00
February	23968	0.13	183970	0.19	1	0.00
March	16921	0.09	131188	0.13	1	0.00
April	13416	0.08	104936	0.12	1	0.00
May	16603	0.12	128806	0.16	1	0.00
June	15138	0.10	117834	0.13	1	0.00

Month	Street Light					
	Unit	% of total Unit	Revenue	% of total Revenue	Consumer	% of total Consumer
July	11821	0.08	85042	0.10	39	0.03
August	11606	0.07	85087	0.09	38	0.03
September	14694	0.09	106069	0.12	38	0.03
October	16116	0.09	117160	0.12	38	0.02
November	20036	0.14	144726	0.18	38	0.02
December	20544	0.16	148311	0.19	38	0.02
January	24676	0.16	177936	0.21	38	0.02
February	17511	0.09	127942	0.13	38	0.02
March	15111	0.08	110805	0.11	38	0.02
April	65771	0.38	451128	0.50	40	0.02
May	14496	0.10	105702	0.13	39	0.02
June	13445	0.08	98017	0.11	39	0.02

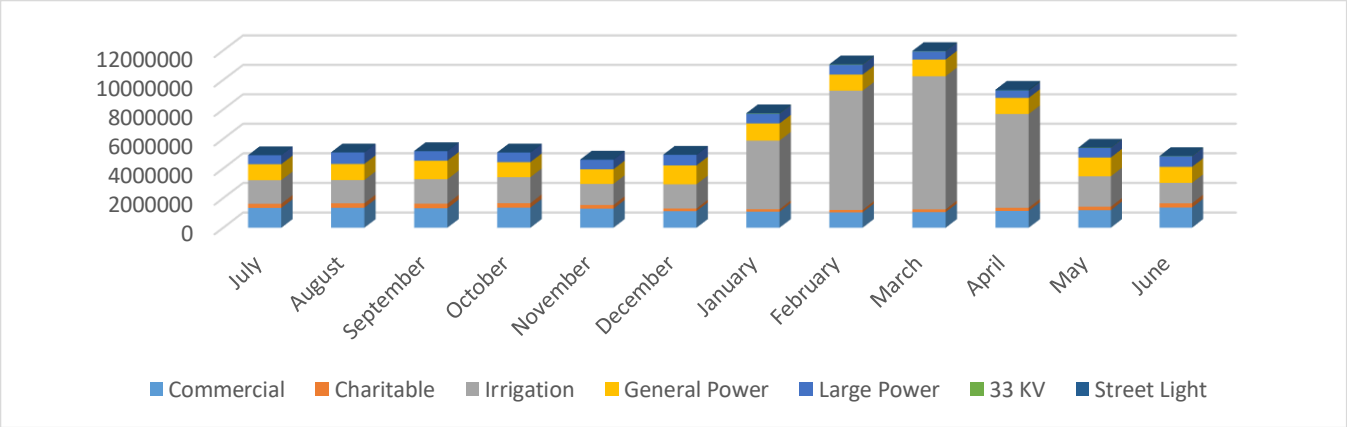


Fig 5.7.3: Monthly Unit Consumption of other Slabs of Jamalpur PBS (2015-16)

From the Bar chart shows that Irrigation slabs consume large amount of energy from January to April than other months. Consumption of Charitable Institutions and General Power are regular. Consumption of Commercial and Large Power are quite the same. Street Light Energy consumers have a small amount as shown in the figure of JPBS. In this fiscal year there is no 33 KV energy consumers.

5.7 Summary

Revenue of JPBS 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 6

ELECTRICITY COST AND RATE

6.1 Electricity Cost

Cost is an important term in any business, where profit or loss is a concern. Supplying electricity is a business also. 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, cost of electricity is important to improve economic and social benefits.

6.2 Electricity Purchase Cost (EPC)

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, PPBS-2 pays BPDB or their IPPs bulk price to buying electric energy and wheeling charge to PGCB for wheeling.

6.2.1 Bulk Rate

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

6.2.2 Wheeling Charge

PGCB is paid wheeling charges by the distribution companies. The company has taken infrastructure development projects for further development of its operation. In order to financial new investment, ensure proper maintenance of its existing assets, PGCB requires to be 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 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 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.

6.3 Distribution Cost

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 Expenses + Consumer selling expenses + Administration & General Expenses + Depreciation & Amortization + Tax Expenses + Interest Expenses.

Table 6.1.1: Distribution and Total Supply Cost in 2017-18 of JPBS

Month	EC	Distribution Cost						Total Distribution cost	Total Supply Cost
		OME	CSE	AGE	DAE	TE	IE		
July	12.369	0.839	0.826	0.527	3.540	0.013	0.611	6.355	18.724
August	12.592	1.151	1.243	0.679	2.500	0.046	0.611	6.229	18.821
Septembe	12.420	0.866	0.858	0.602	1.888	0.052	0.611	4.876	17.296
October	10.830	0.807	0.845	0.573	1.892	0.171	0.611	4.900	15.730
Novembe	8.838	0.834	0.831	0.537	2.060	0.058	0.611	4.930	13.768
Decembe	8.898	0.968	0.969	0.665	2.066	0.101	0.754	5.523	14.421
January	10.434	0.629	0.868	0.617	2.069	0.044	0.635	4.862	15.296
February	11.123	0.805	1.415	0.953	2.076	0.035	0.635	5.919	17.042
March	12.607	0.822	1.074	0.684	2.085	0.086	0.635	5.386	17.993
April	10.930	0.707	0.892	0.553	2.140	0.095	0.635	5.022	15.952
May	10.273	1.077	1.372	0.806	2.152	0.041	3.455	8.904	19.177
June	14.204	0.695	1.006	3.817	0.495	0.064	0.000	6.078	20.282
Grand total	**135.518**	**10.200**	**12.200**	**11.014**	**24.962**	**0.807**	**9.801**	**68.984**	**204.502**

Table 6.1.2: Distribution and Total Supply Cost in 2016-17 of JPBS

Month	EC	Distribution Cost						Total Distribution cost	Total Supply Cost
		OME	CSE	AGE	DAE	TE	IE		
July	10.608	0.683	0.842	0.512	2.543	0.020	0.537	5.137	15.745
August	9.084	0.943	1.253	0.713	2.719	0.063	0.537	6.228	15.312
Septembe	9.545	0.760	0.875	0.592	2.927	0.051	0.537	5.741	15.286
October	9.072	0.739	0.794	0.583	1.615	0.064	0.537	4.332	13.404
Novembe	7.950	0.759	0.793	0.571	1.696	0.041	0.537	4.396	12.346
Decembe	8.084	0.990	0.937	0.665	1.651	0.112	0.962	5.316	13.400
January	6.809	0.679	0.859	0.593	1.224	0.045	0.608	4.008	10.817
February	9.712	0.826	0.847	0.566	1.679	0.014	0.608	4.539	14.251
March	7.036	0.888	0.975	0.575	1.680	0.079	0.608	4.804	11.840
April	6.790	0.980	1.434	0.753	1.591	0.034	0.608	5.398	12.188
May	5.394	9.011	0.836	0.593	1.694	0.039	0.608	12.781	18.175
June	2.935	1.495	1.239	3.631	(0.601)	0.063	0.627	6.454	9.389
Grand total	**93.019**	**18.754**	**11.685**	**10.346**	**20.418**	**0.624**	**7.309**	**69.136**	**162.155**

Table 6.1.3: Distribution and Total Supply Cost in 2015-16 of JPBS

Month	EC	Distribution Cost						Total Distribution cost	Total Supply Cost
		OME	CSE	AGE	DAE	TE	IE		
July	8.628	0.711	0.926	0.464	1.913	0.019	0.534	4.567	13.195
August	8.523	0.470	0.575	0.336	1.212	0.001	0.534	3.127	11.650
Septembe	9.035	0.735	0.833	0.445	1.189	0.002	0.534	3.737	12.772
October	8.394	0.553	0.655	0.388	1.230	0.185	0.534	3.545	11.939
Novembe	6.674	0.516	0.593	0.385	1.240	0.056	0.534	3.322	9.996
Decembe	6.944	0.598	0.675	0.445	1.255	0.008	0.552	3.533	10.477
January	8.485	0.639	1.158	0.696	1.269	0.013	0.537	4.311	12.796
February	9.613	0.426	0.594	0.441	1.278	0.059	0.537	3.334	12.947
March	10.330	0.418	0.608	0.277	1.285	0.115	0.537	3.239	13.569
April	9.724	0.610	0.671	0.456	1.362	0.044	0.537	3.680	13.404
May	8.071	1.285	0.607	0.393	1.368	0.021	0.537	4.210	12.281
June	(13.839)	1.618	1.486	0.373	(2.251)	0.116	0.942	2.284	-11.555
Grand total	**80.582**	**8.576**	**9.382**	**5.099**	**12.350**	**0.638**	**6.844**	**42.889**	**123.471**

6.3.1 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. In Table 7.1 all data are describe in crore taka.

6.3.2 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.

6.3.3 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.

6.3.4 Depreciation & Amortization Expenses (DAE)

The depreciation expenses included as a cost is the monthly depreciation for all used and useful assets. In a broader economic sense, the depreciation cost is the aggregate amount of capital that is "used up" in a given period, such as a fiscal year. This value can be examined for trends in capital spending and accounting aggressiveness. JPBS calculates 20% depreciation of its assets per year.

6.3.5 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.

6.3.6 Interest Expenses (IE)

Expenses of payable interests on loans from bank, BREB or from any other loans are included as IE. In 2017-18, J PBS pays 9.801 crore Taka.

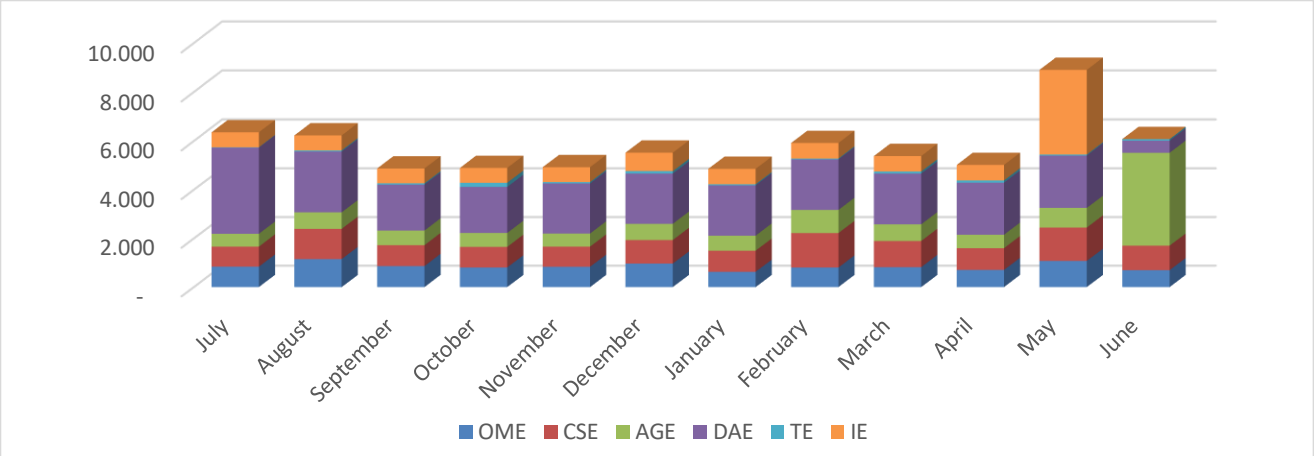


Fig 6.1.1: Distribution Cost of JPBS (10^7 Tk), 2017-18

In Fig 6.1.1, DAE was quite abnormal in July, 2017 and June, 2018. AGE was very high in June, 2018 respect the other months. CSE rise in August, 2017; February, 2018 and May, 2018 above 200 % from rest of the months. OME increased in August, 2017 and May, 2018. In May, 2018 IE was higher than other months of the year where June, 2018 was zero.

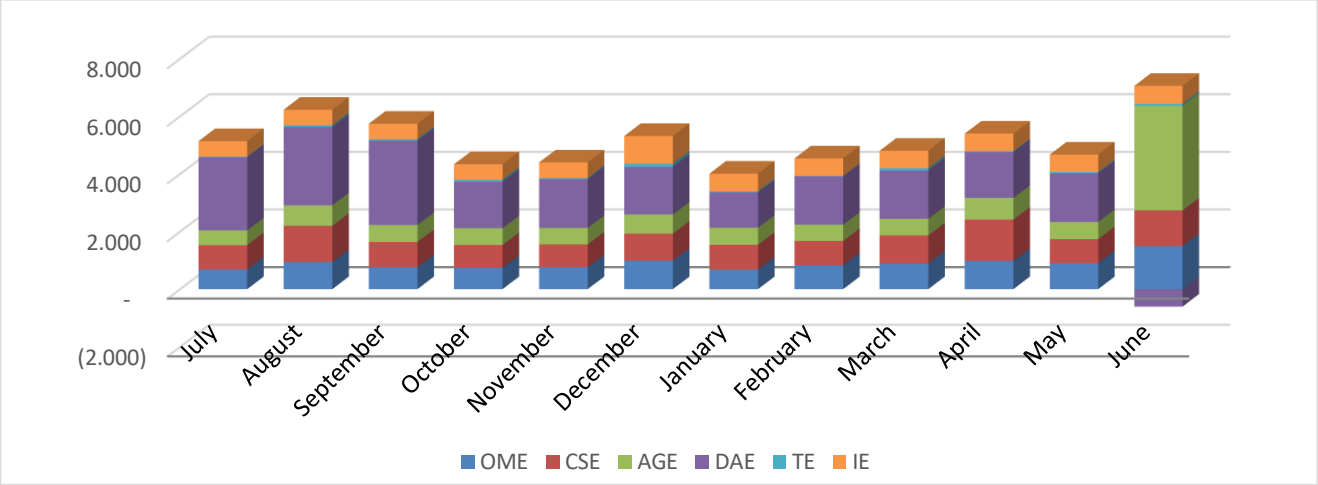


Fig 6.1.2: Distribution Cost of JPBS (10^7 Tk), 2016-17

In Fig 6.1.2, DAE was higher in September, 2016 and June, 2017 DAE is negative. AGE was the highest in June, 2017 than the other months. CSE rise in August, 2016; April, 2017 & June, 2017 from rest of the months. OME increased in June, 2017. IE was higher than other months in June, 2017.

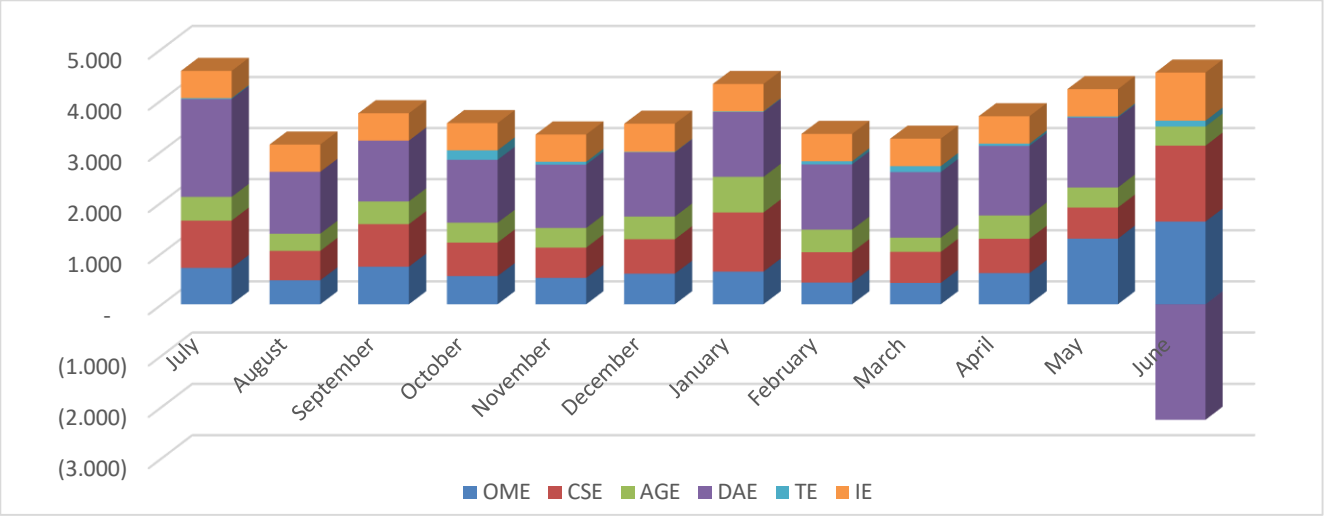


Fig 6.1.3: Distribution Cost of JPBS (10^7 Tk), 2015-16

In Fig 6.1.1, DAE was high in July, 2015 and June, 2016 it was abnormal. AGE was high in January, 2016 respect the other months. CSE rise in July 2015; January, 2016 & June 2016 from rest of the months. OME increased in May & June 2016. In June, 2016 IE was higher than other months of the year. TE was high in October 2015 of this fiscal year where August, September, December 2015 and January, May 2016 were quite zero.

6.3.7 System Loss (Tk)

Calculate system loss KWh in taka. System loss in taka is help to calculate the distribution cost more correctly and showed an economical figure of system loss. JPBS had a system loss of total 7.569 crore taka in 2017-18.

System Loss (Tk) = System Loss (Energy) X System loss (Tk/Unit)

6.4 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. Revenue of JPBS 10 to 13 crore taka per month in 2017-18.

Table 6.2.1: Import energy, Purchase cost, Expenditure, Sell energy, Revenue, Distribution cost of energy according to the Thesis Calculation on JPBS (2017-2018)

Month	Energy Import (MU)	Energy Purchase Cost (10^7Tk)	Energy Sell (MU)	Distribution cost (10^7Tk)	Total Supply Cost (10^7Tk)	Revenue from Sale Energy (10^7Tk)	Revenue from other sources (10^7Tk)	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	27.431	13.1343	21.759	6.355	20.197	12.061	0.286	12.347	20.675	-7.850	0.708	1.248	3.246	4.501
August	27.925	13.371	21.821	6.229	20.418	12.127	0.272	12.399	21.860	-8.019	0.818	1.340	3.229	4.440
September	27.544	13.189	23.926	4.876	18.327	13.070	0.339	13.409	13.136	-4.918	0.262	0.724	2.148	4.868
October	24.018	11.500	21.451	4.900	16.547	11.808	0.422	12.230	10.690	-4.317	0.147	0.573	2.353	5.092
November	19.600	9.385	18.345	4.930	14.356	10.380	0.470	10.850	6.399	-3.506	0.041	0.327	2.710	5.536
December	19.734	9.108	16.896	5.523	14.851	9.990	0.409	10.399	14.380	-4.452	0.220	0.775	3.399	5.270
January	23.139	10.679	18.859	4.862	15.990	10.597	0.954	11.551	18.499	-4.439	0.448	1.048	2.816	4.992
February	24.668	11.385	21.136	5.919	17.576	11.281	0.470	11.752	14.317	-5.824	0.272	0.771	2.929	4.764
March	27.959	12.904	22.338	5.386	18.943	11.802	0.411	12.212	20.104	-6.730	0.653	1.161	2.704	4.368
April	24.240	11.187	19.762	5.022	16.677	10.909	0.722	11.632	18.472	-5.046	0.468	1.046	2.778	4.799
May	22.783	10.515	17.272	8.904	20.230	10.131	0.734	10.866	24.190	-9.365	0.812	1.473	5.625	4.769
June	31.501	14.529	20.122	6.078	23.575	11.707	3.104	14.811	36.122	-8.763	2.968	2.608	4.495	4.702
Grand total	**300.542**	**140.886**	**243.688**	**68.984**	**217.686**	**135.863**	**8.593**	**144.457**	**218.84**	**-73.23**	**7.817**	**13.094**	**38.431**	**58.100**

Table 6.2.2: Import energy, Purchase cost, Expenditure, Sell energy, Revenue, Distribution cost of energy according to the Thesis Calculation on JPBS (2016-2017)

Month	Energy Import (MU)	Energy Purchase Cost (10^7Tk)	Energy Sell (MU)	Distribution cost (10^7Tk)	Total Supply Cost (10^7Tk)	Revenue from Sale Energy (10^7Tk)	Revenue from other sources (10^7Tk)	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	23.527	10.608	18.841	5.137	16.271	10.587	0.182	10.769	19.917	-5.502	0.525	1.121	3.006	4.577
August	20.146	9.084	18.417	6.228	15.386	10.615	0.291	10.906	8.580	-4.480	0.073	0.423	3.422	5.413
Septembe	21.168	9.545	17.974	5.741	15.542	10.093	0.269	10.362	15.092	-5.181	0.256	0.801	3.337	4.895
October	20.120	9.072	17.512	4.332	13.580	9.822	0.340	10.162	12.963	-3.418	0.175	0.672	2.574	5.051
Novembe	17.631	7.950	16.572	4.396	12.377	9.463	0.358	9.821	6.005	-2.556	0.031	0.288	2.671	5.570
Decembe	17.929	8.084	15.183	5.316	13.624	8.901	0.376	9.277	15.315	-4.348	0.224	0.815	3.649	5.174
January	21.522	9.704	18.486	4.008	13.937	10.053	0.502	10.555	14.108	-3.382	0.225	0.741	2.290	4.904
February	21.540	9.712	19.103	4.539	14.392	10.048	0.324	10.372	11.312	-4.019	0.140	0.575	2.449	4.815
March	24.111	10.872	21.759	4.804	15.791	10.434	0.337	10.771	9.753	-5.019	0.115	0.487	2.261	4.467
April	20.052	9.042	16.778	5.398	14.728	9.333	0.318	9.651	16.325	-5.077	0.288	0.880	3.389	4.813
May	18.986	8.561	14.880	4.671	13.743	8.719	0.309	9.028	21.623	-4.715	0.511	1.244	3.482	4.755
June	25.084	11.311	17.622	6.454	19.190	9.979	0.449	10.428	29.748	-8.761	1.425	1.909	4.471	4.157
Grand total	**251.815**	**113.546**	**213.128**	**61.026**	**178.559**	**118.046**	**4.055**	**122.101**	**180.74**	**-56.46**	**3.987**	**9.957**	**37.000**	**58.593**

Table 6.2.3: Import energy, Purchase cost, Expenditure, Sell energy, Revenue, Distribution cost of energy according to the Thesis Calculation on JPBS (2015-2016)

Month	Energy Import (MU)	Energy Purchase Cost (10^7Tk)	Energy Sell (MU)	Distribution cost (10^7Tk)	Total Supply Cost (10^7Tk)	Revenue from Sale Energy (10^7Tk)	Revenue from other sources (10^7Tk)	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	20.248	9.130	15.191	4.567	14.456	8.431	0.188	8.619	24.976	-5.837	0.759	1.501	3.506	4.257
August	19.995	9.016	16.818	3.127	12.414	9.337	0.309	9.646	15.888	-2.767	0.271	0.852	2.020	4.824
Septembe	20.042	9.037	16.450	3.737	13.128	9.170	0.250	9.419	17.923	-3.708	0.354	0.985	2.487	4.700
October	18.616	8.394	17.165	3.545	11.995	9.558	0.406	9.964	7.796	-2.031	0.055	0.381	2.097	5.352
Novembe	14.803	6.675	13.836	3.322	10.027	8.059	0.496	8.555	6.527	-1.472	0.030	0.315	2.423	5.780
Decembe	15.402	6.945	13.026	3.533	10.673	7.616	0.400	8.015	15.426	-2.658	0.195	0.822	2.862	5.204
January	18.821	8.486	15.855	4.311	13.047	8.585	0.420	9.005	15.756	-4.043	0.250	0.843	2.877	4.784
February	21.320	9.614	18.960	3.334	13.081	9.744	2.620	10.006	11.073	-3.075	0.133	0.561	1.829	4.693
March	22.910	10.330	19.283	3.239	13.878	9.809	0.282	10.092	15.832	-3.786	0.308	0.848	1.839	4.405
April	21.566	9.724	17.309	3.680	13.877	9.100	0.284	9.384	19.740	-4.493	0.472	1.109	2.399	4.351
May	17.900	8.071	14.314	4.210	12.686	8.162	0.364	8.526	20.032	-4.160	0.405	1.130	3.224	4.763
June	20.416	9.206	15.941	2.284	12.056	9.056	2.242	11.298	21.921	-0.758	0.567	1.266	1.788	5.534
Grand total	232.039	104.629	194.148	42.889	151.316	106.627	8.260	112.529	192.89	-38.79	3.799	10.613	29.351	58.648

6.4.1 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.

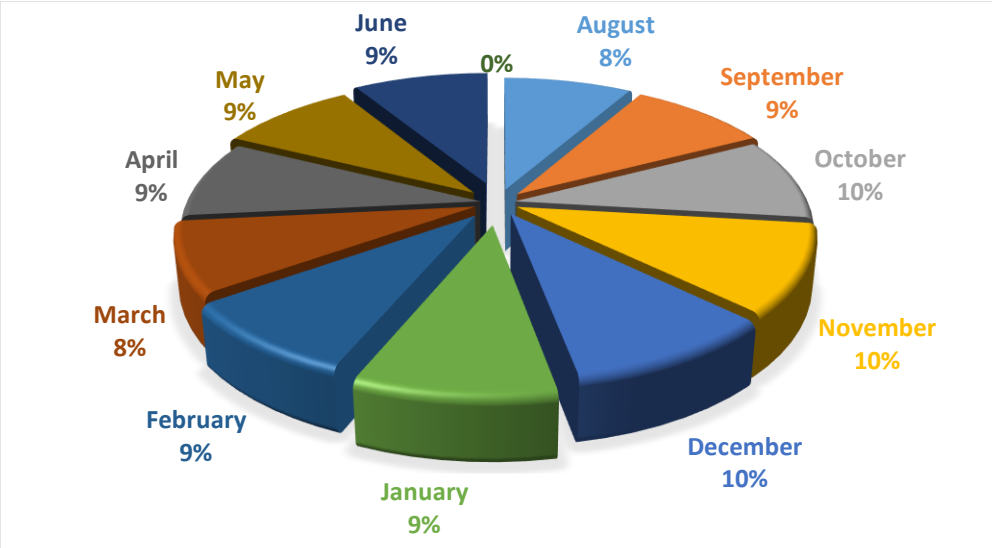


Fig 6.2.1: Revenue per Month (in %), 2017-18

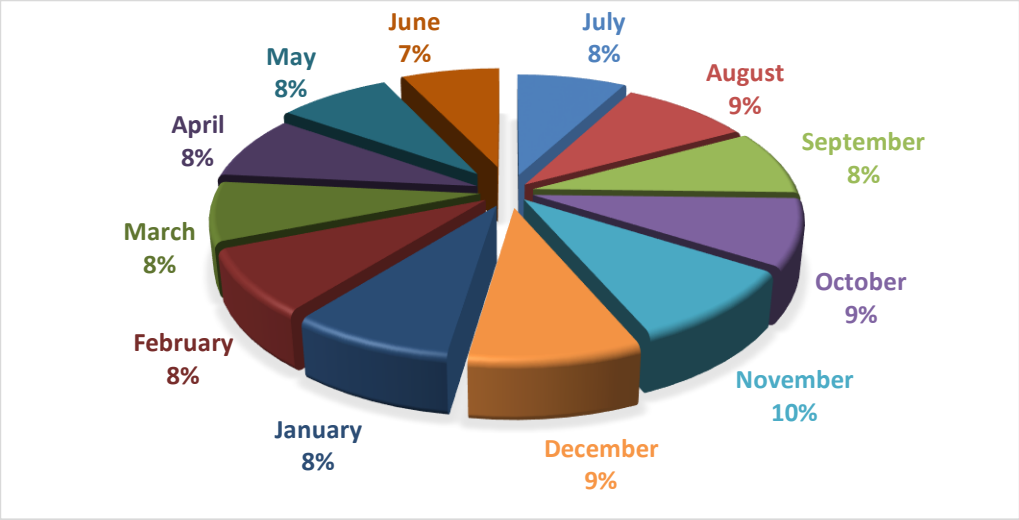


Fig 6.2.2: Revenue per Month (in %), 2016-17

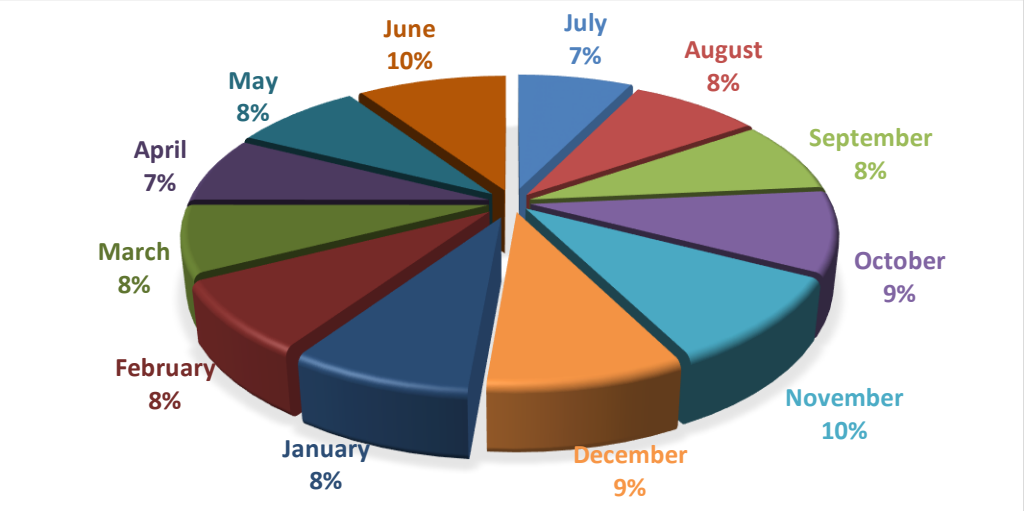


Fig 6.2.3: Revenue per Month (in %), 2015-16

6.4.1.1 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.

6.4.1.2 Revenue from Others

Revenue from others is actually 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.

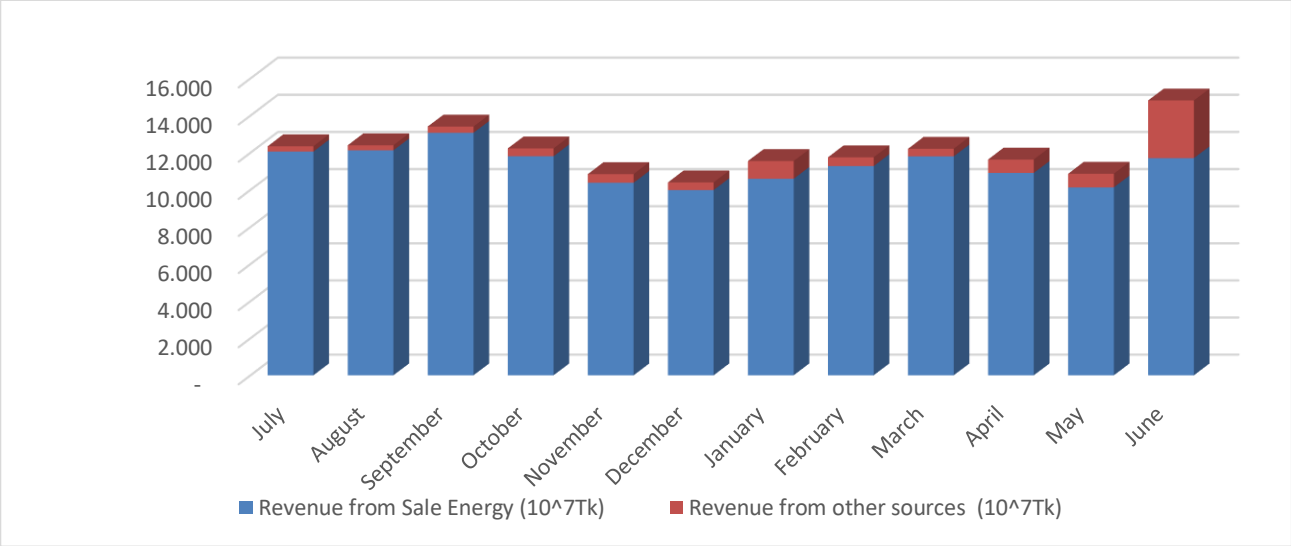


Fig 6.3.1: Monthly Total Revenue of JPBS (10^7 taka), 2017-18

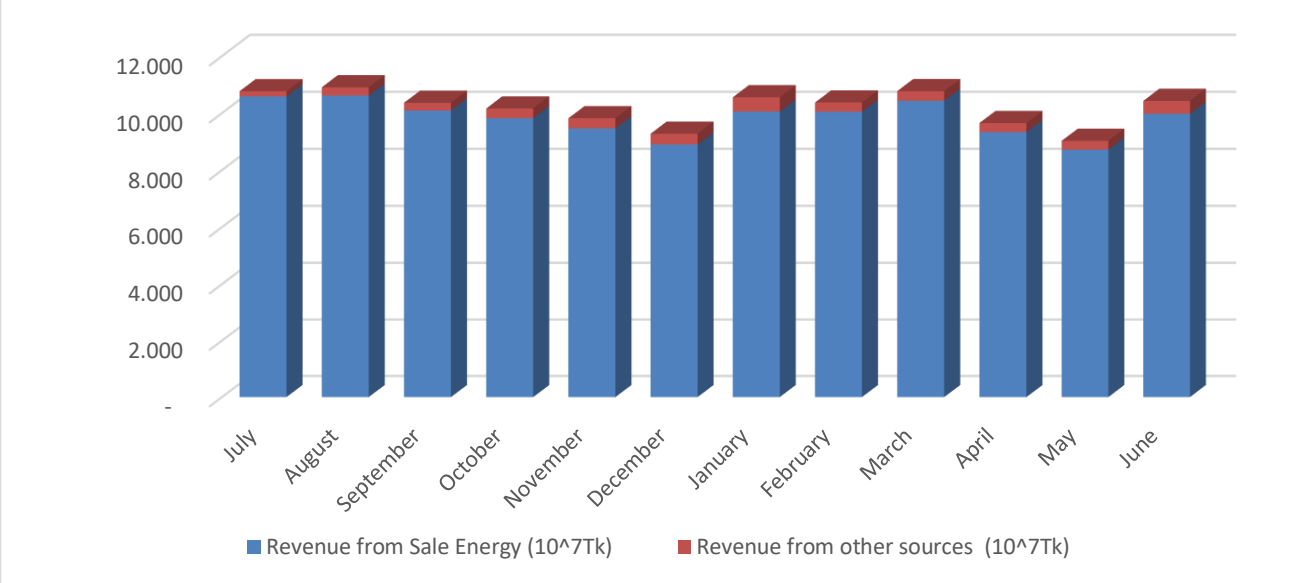


Fig 6.3.2: Monthly Total Revenue of JPBS (10^7 taka), 2016-17

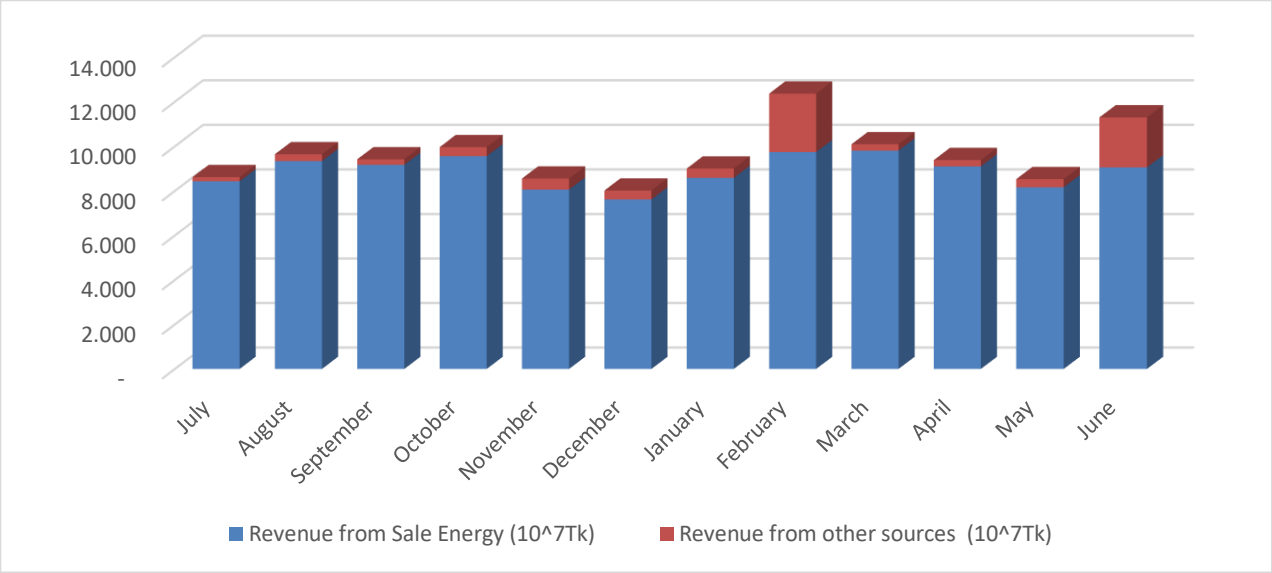


Fig 6.3.3: Monthly Total Revenue of JPBS (10^7 taka), 2015-16

6.4.1.3 Other Operating Revenue

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

6.4.1.4 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.

6.5 Total Supply Cost (TC)

From purchase to supply electric energy to the consumers, total cost is said to be the Total Supply Cost. This is the total operational expenses of a PBS. In 2017-18 fiscal year, JPBS showed about 212.071 crore 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)

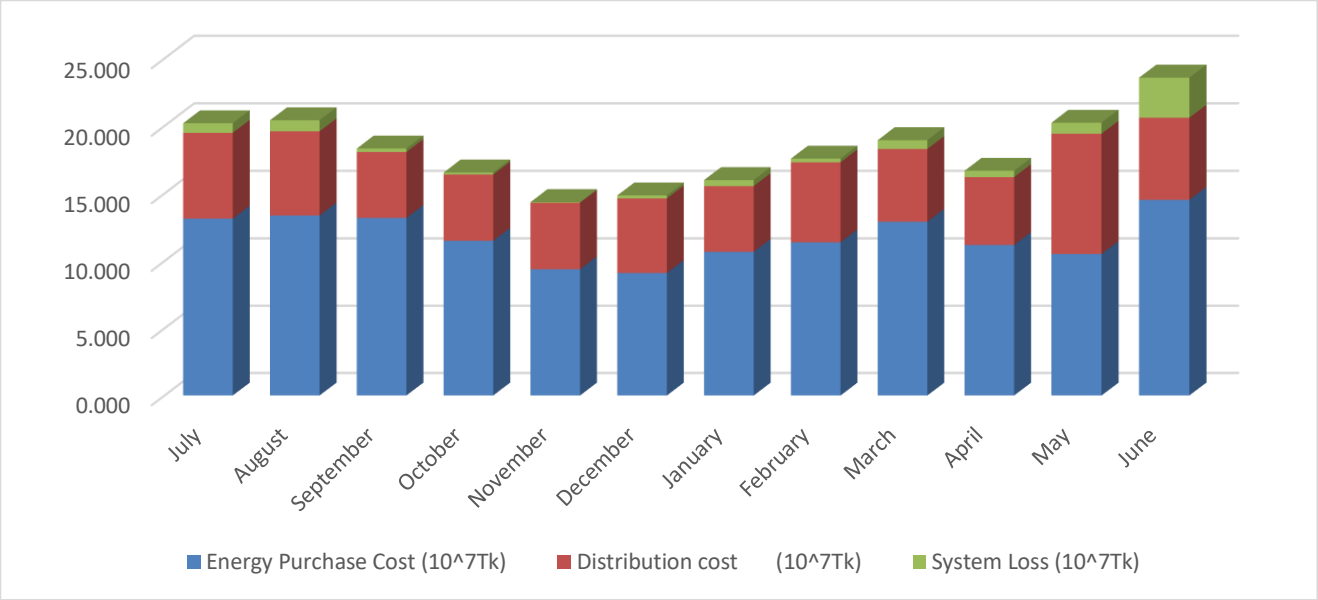


Fig 6.4.1: Monthly Total Supply Cost of JPBS, 2017-18

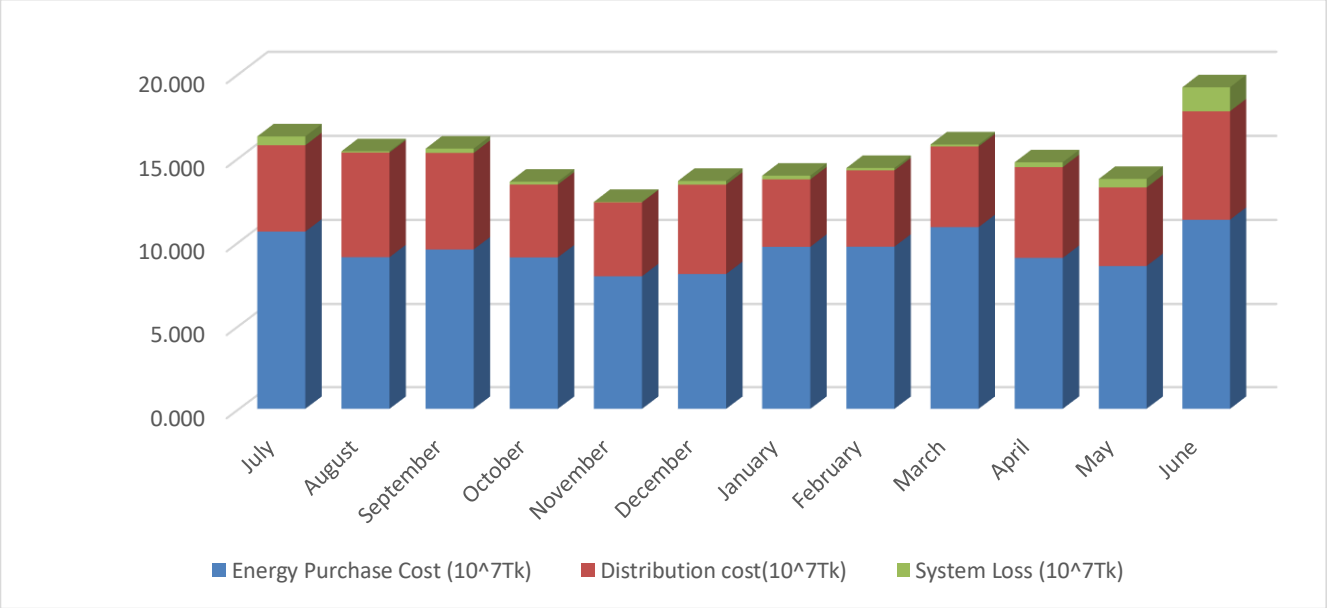


Fig 6.4.2: Monthly Total Supply Cost of JPBS, 2016-17

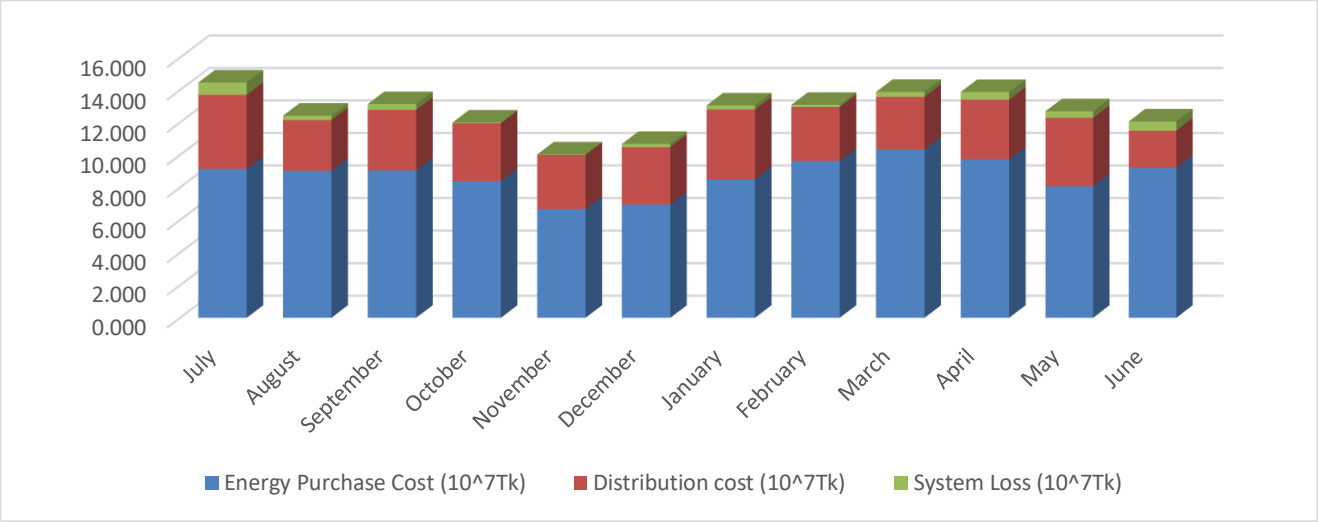


Fig 6.4.3: Monthly Total Supply Cost of JPBS, 2015-16

6.6 Surplus

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

Surplus = Total Revenue - Total Supply Cost

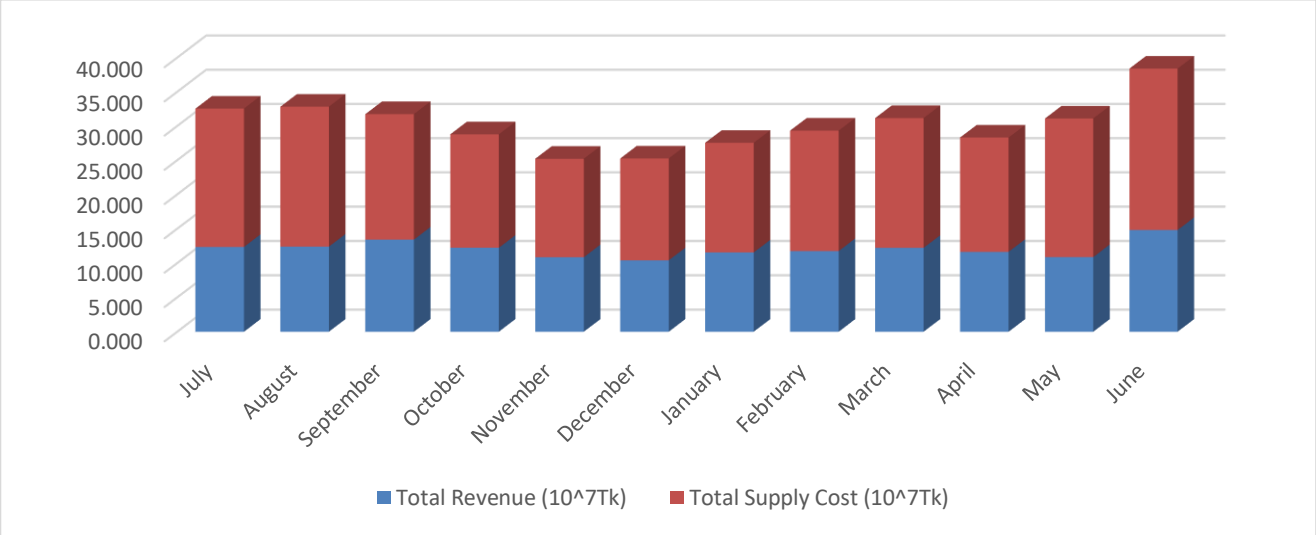


Fig 6.5.1: Monthly revenue with Supply cost of JPBS, 2017-18

As we see in Fig 6.5.1 surplus of Jamalpur PBS is in negative position due to high distribution expenses and system loss. In Fig 6.4.1 distribution cost was abnormally high in July, 2017 and May, 2018. In May and June, 2018 system loss (Taka) was also high. Total supply cost was above 23 crore taka in June, 2018 where highest revenue was around 17 crore taka in average. This is a huge gap.

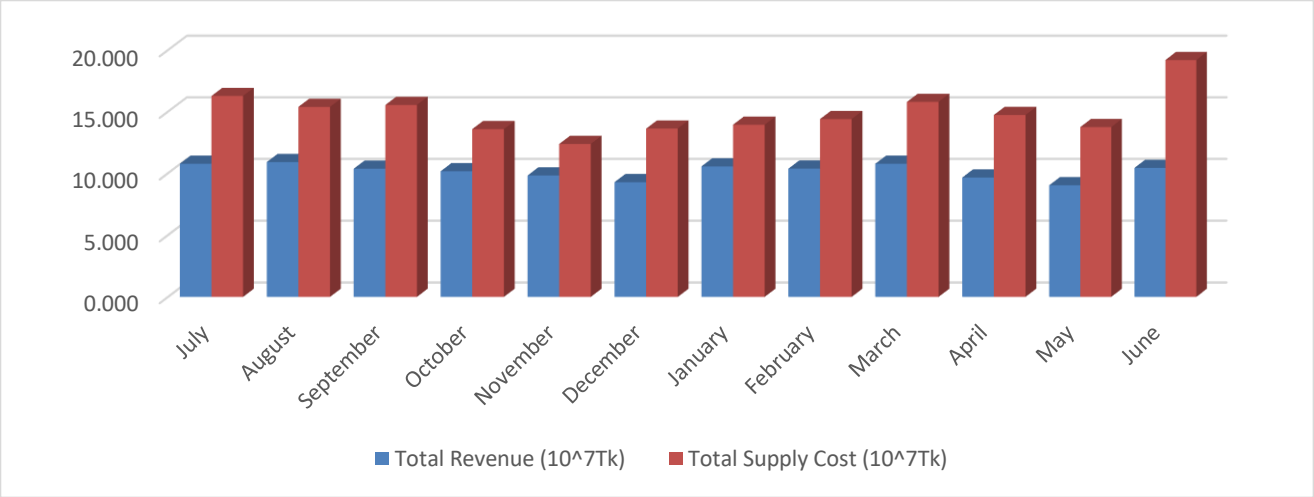


Fig 6.5.2: Monthly revenue with Supply cost of JPBS, 2016-17

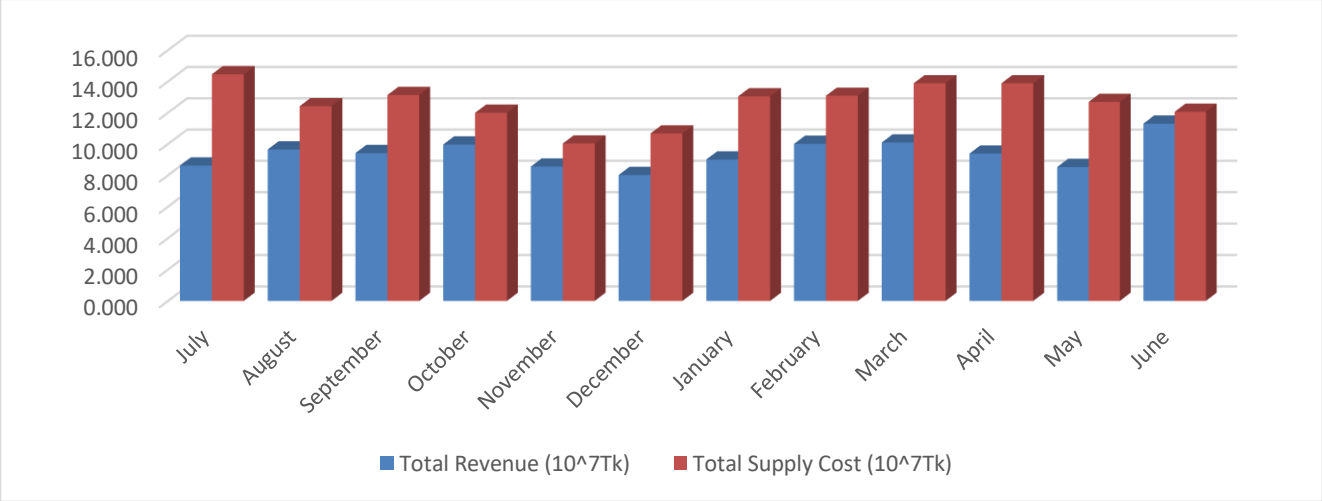


Fig 6.5.3: Monthly revenue with Supply cost of JPBS, 2015-16

6.7 Per Unit Cost Calculation

Per unit cost calculated to find cost or revenue of one unit energy that's why we assume profit and loss in short. Here we listed some per unit calculation for JPBS:

6.7.1 Distribution Cost (Tk. /Unit)

In July, 2017 JPBS had 20.197 crore taka Total Supply Cost, 13.134 crore taka Energy Purchase Cost and Energy sell is 21.759 MU. So the Distribution cost (Tk/Unit) of July, 2017

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

= ((20.197– 13.134) / 21.759) * 10

= **3.246**Tk/Unit

6.7.2 Revenue (Tk. /Unit)

In July, 2017 JPBS had 13.134 crore taka Total Revenue and import 27.431 MU energy. So Revenue on July, 2017 was,

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

= (13.134/ 27.431) * 10

= **4.788** Tk / Unit

6.7.3 System Loss Tk. /Unit (SL)

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

In July, 2017 JPBS had purchased 27.431 MU with 13.134 crore taka and Energy sell is 21.759 MU. So the system loss (Tk. /Unit) of July, 2017 was

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

=((13.134/21.759)-(13.134/27.431))*10

=**1.248**Tk / Unit

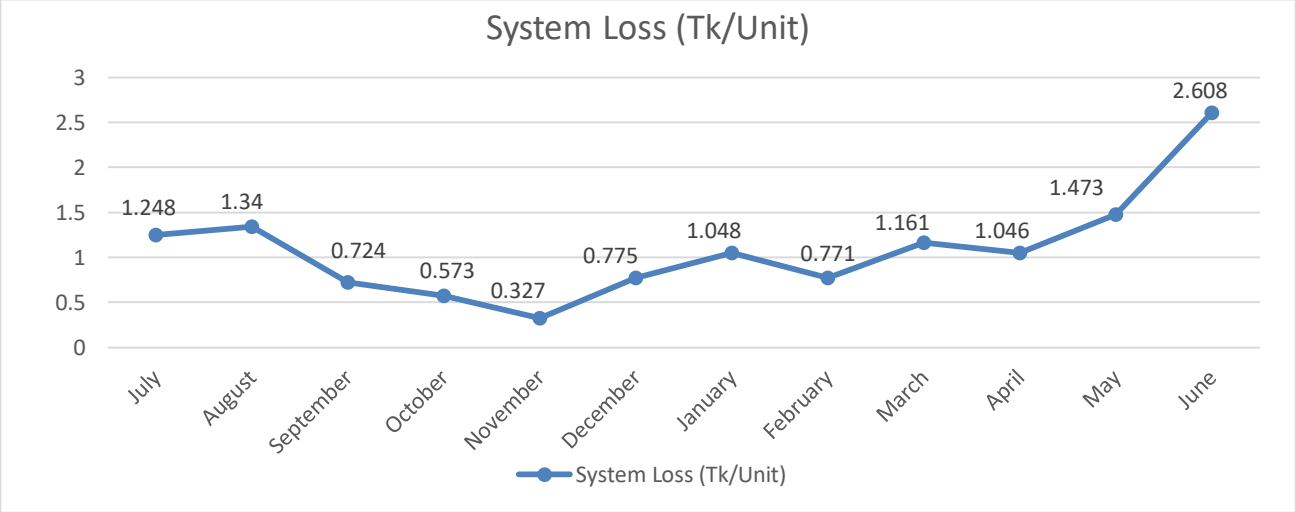


Fig 6.6.1: Month Wise System Loss (TK/Unit) of JPBS, 2017-2018

From the line chart, Month wise system loss is very high in June 2018 from the other months of the year where the loss is very low in November 2017.

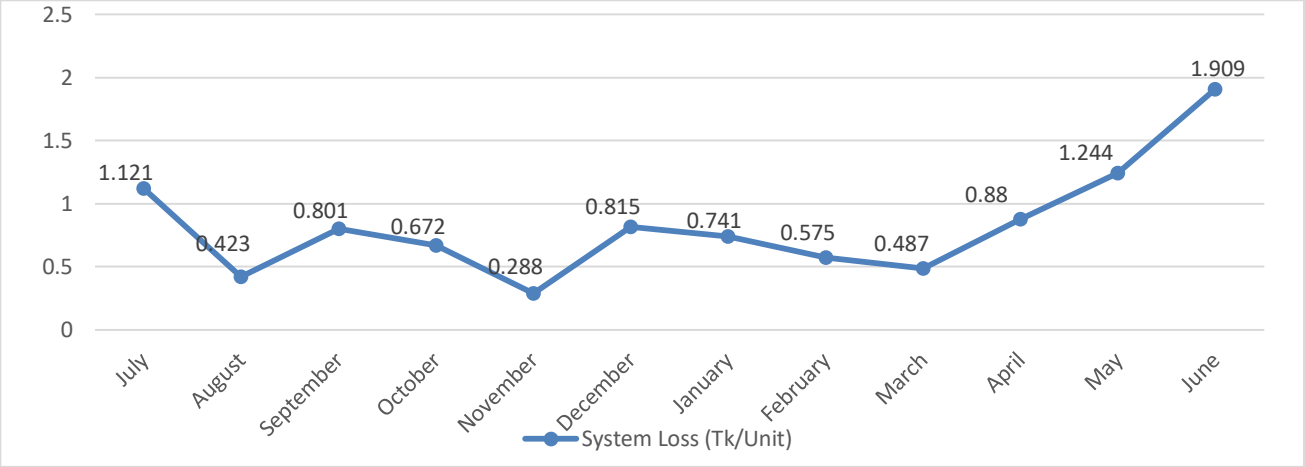


Fig 6.6.2: Month Wise System Loss (TK/Unit) of JPBS, 2016-2017

Figure 6.6.2 shows that month wise system loss is higher in June 2017 and the loss is lower in November 2016 than in other months of the year.

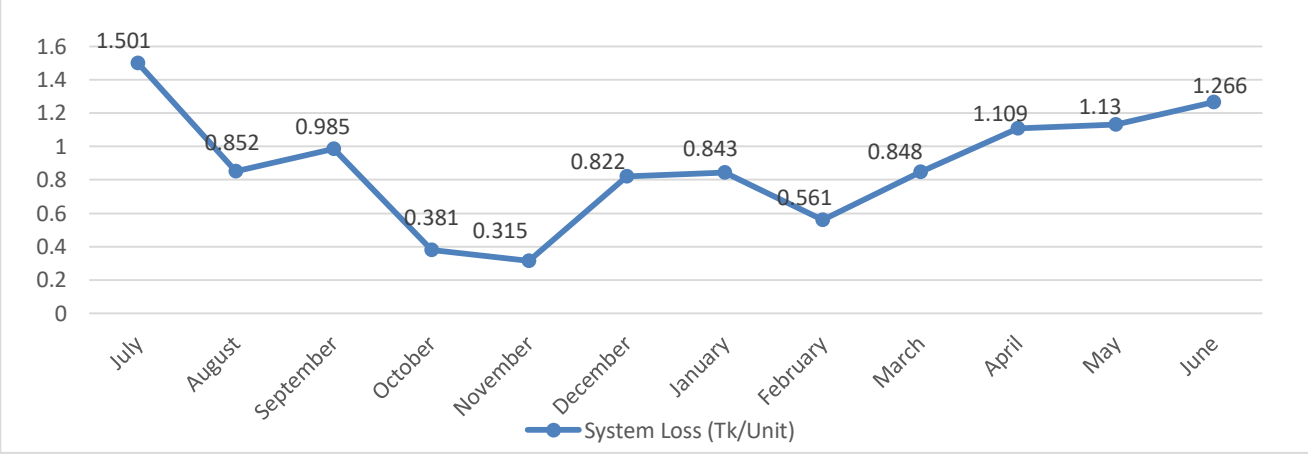


Fig 6.6.3: Month Wise System Loss (TK/Unit) of JPBS, 2015-2016

Figure 6.6.3 shows that month wise system loss is higher in July 2015 & June 2016 and the loss is lower in October 2015 & November 2015 than other months of the year.

6.8 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 bill from month September 2015 shown in Table 6.3. In this table, it's also shown rate and slabs change since December, 2009.

Table 6.3: Tariff Rates Since 2009 to 2016

Consumer class	Slab	Before Dec-2009	01-Dec, 09	Slab	01 Dec, 11	01 Feb, 12	01 Mar, 12	Slab	01 Sep, 12	Slab	01 Mar, 14	01 Sep, 15
	0-25	0	0	Min	0	0	0	Min	0	Min	0	0
	0-100	2.53-2.90	2.64-3.03	00-100	2.77-3.78	2.9-3.34	3.08-3.55	0-75	3.36-3.87	0-50	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	0-75	3.87	3.8
Domestic	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	8.7
										600++	9.93	9.98
				Flat	6.8	7.33	7.79	Flat	9	Flat	9.58	9.8
Commercial		5.11-5.15	5.62-5.66	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
Irrigation		2.60-3.05	2.6-3.05		2.73-2.20	2.87-3.36	3.05-3.57		3.39-3.96		3.39-3.96	3.82
				Flat	5.27	5.67	6.02	Flat	6.95	Flat	7.42	7.66
General Power		3.91-4.10	4.30-4.51	Off Peak	4.41	4.86	5.16	Off Peak	5.96	Off Peak	6.64	6.9
				Peak	4.41	6.9	7.33	Peak	8.47	Peak	9	9.24
				Flat	5.14	5.55	5.9	Flat	6.81	Flat	7.32	7.57
Large Power		3.80-3.95	4.18-4.34	Off Peak	4.4	4.86	5.16	Off Peak	5.96	Off Peak	6.62	6.88
				Peak	7.55	7.6	8.08	Peak	9.33	Peak	9.33	9.57
				Flat	4.88	5.28	5.61	Flat	6.48	Flat	7.2	7.49
33 KV				Off Peak	4.3	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		4.9	5.28	5.61		6.48		6.93	7.17

6.9 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.

6.10 Summary

In this chapter, electricity rate, revenue and expenses or cost of JPBS 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. JPBS find in massive loss.

CHAPTER 7

CONCLUSION

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. However, we have huge lack of electricity in Bangladesh but all of generation, substation, consultancy, and local member service of BREB is more efficient and taking important role to cover lack of electricity. 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

There are few limitations I have faced are mentioned below-

- In this study the data of JPBS I have used, collected from BREB (Bangladesh Rural Electrification Board) and JPBS but I think some of these data are assumption.
- The distribution cost of JPBS 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. I have also calculated the tariff rate of electric power which 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 and transmission 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, I discussed about Distribution cost of Jamalpur PBS, how to calculate, with examples. I 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 FUNCTIONS OF REB:

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 Bidyut Samity (PBS).These PBSs consists of several members. But PBS is directed by a member of REB.A organization chart of REB is given below:

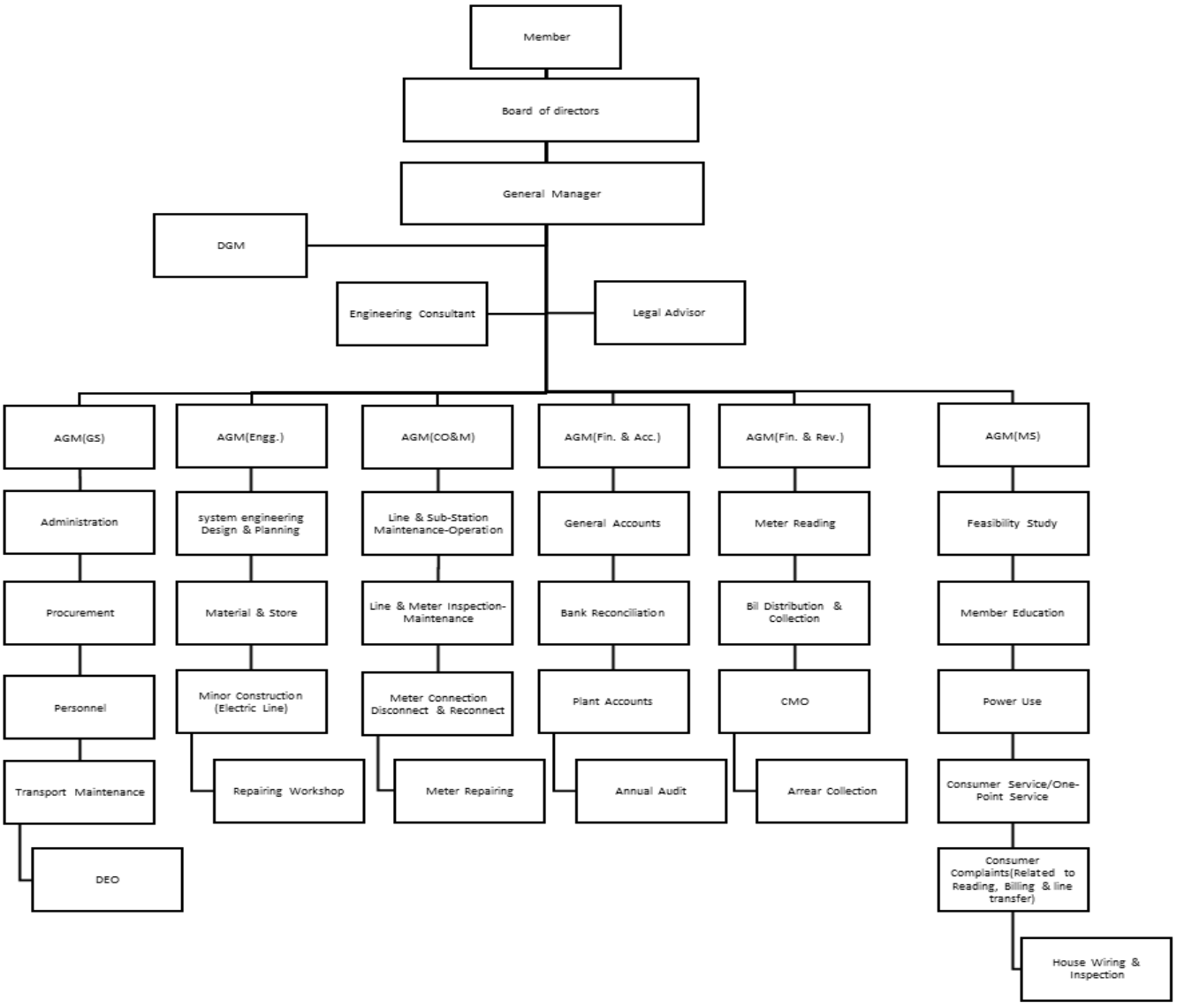

Fig 7.1: Organization of REB

APPENDIX- B

Formula According to Thesis

Total revenue =Revenue from sales of energy + Revenue from other sources

Revenue from others = Other Operating Revenue + Non-operating Margins- interest+ Non-operating Margins-Others

Distribution cost = Operation & Maintenance Expenses + 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 = $\frac{\text{Total Unit kWh(Purchase)}}{(\text{Total Peak demand} \times 1000) \times 24 \times 30)} \times 100$

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 related values

APPENDIX- C

As per Sub-station Meter Data with Load Factor (2017-18) of JPBS

Import point	November'17				December'17			
	Peak Demand(MW)	Unit Wh(Purchase	Total KWh(sold)	Substation SL %	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	10.000	2,641,000			10.000	2,937,000		
Sharishabari	9.895	2,549,250			10.000	2,524,500		
Sherpur	-	-			-	-		
Malandha	5.670	2,546,500			6.000	2,535,500		
Nurundi	5.800	1,541,000			5.000	1,598,000		
Baxigonj	5.400	1,662,180	18,345,339	0.32	5.400	1,714,860	16,896,306	**10.23**
Islampur	8.550	2,880,000			8.500	2,943,000		
Toma concrit	0.880	26,125			0.880	19,250		
Mathergonj	6.500	2,383,000			6.500	2,379,000		
Baxigonj JSL	0.270	391,408			0.270	345,034		
Dawangonj-2	5.900	1,784,664			5.500	1,824,830		
Total	**58.865**	**18,405,127**			58.050	**18,820,974**		

Import point	September'17				October'17			
	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	9.105	4,675,000			10.000	3,505,000		
Sharishabari	11.000	3,902,250			9.890	3,151,500		
Sherpur	-	-			-	-		
Malandha	5.200	3,250,500			5.670	2,952,452		
Nurundi	6.252	2,343,000			5.800	1,886,000		
Baxigonj	6.390	2,291,800	23,926,131	7.89	5.400	2,128,350	21,450,758	**4.48**
Islampur	7.541	4,036,000			8.550	3,651,000		
Toma concrit	0.890	9,625			0.880	19,250		
Mathergonj	7.560	2,919,000			6.500	2,647,000		
Baxigonj JSL	0.275	240,432			0.270	396,880		
Dawangonj-2	6.163	2,307,633			5.900	2,118,223		
Total	**60.376**	**25,975,240**			58.860	**22,455,655**		

Import point	July'17				August'17			
	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	9.173	3,552,997			9.173	4,632,650		
Sharishabari	2.000	3,819,750			1.269	3,737,250		
Sherpur	-	-			-	-		
Malandha	6.656	3,085,500			6.656	3,349,500		
Nurundi	5.320	2,238,830			5.320	2,362,170		
Baxigonj	6.529	2,078,770	21,759,230	12.78	6.390	2,114,260	21,820,527	**16.37**
Islampur	7.541	4,416,000			7.541	4,376,000		
Toma concrit	0.089	13,750			0.890	9,625		
Mathergonj	5.889	3,356,841			6.000	3,079,159		
Baxigonj JSL	0.038	254,045			0.275	296,175		
Dawangonj-2	6.163	2,129,960			6.163	2,136,031		
Total	**49.398**	**24,946,443**			49.677	**26,092,820**		

Import point	January'18				February'18			
	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	10.100	3,928,068			10.600	3,552,000		
Sharishabari	10.000	3,225,750			11.570	3,522,750		
Sherpur	-	-			-	-		
Malandha	6.000	2,981,000			5.956	3,212,000		
Nurundi	5.000	1,976,000			5.650	2,191,000		
Baxigonj	5.400	1,836,530			5.400	2,140,520		
Islampur	8.500	3,375,000	18,858,787	16.05	8.400	3,541,000	21,136,443	**8.73**
Toma concrit	0.880	27,500			0.880	19,250		
Mathergonj	6.500	2,749,000			7.200	2,720,000		
Baxigonj JSL	0.270	394,386			0.270	351,203		
Dawangonj-2	5.500	1,970,729			5.500	1,908,930		
Dawangonj-1	-	-			-	-		
Total	**58.150**	**22,463,963**			61.426	**23,158,653**		

Import point	March'18				April'18			
	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	10.800	3,986,000			10.500	3,640,000		
Sharishabari	11.570	3,984,750			11.500	3,225,750		
Sherpur	-	-			-	-		
Malandha	5.656	3,657,500			5.500	3,146,000		
Nurundi	7.500	2,742,000			7.500	1,665,000		
Baxigonj	5.500	2,400,000			5.500	2,241,874		
Islampur	8.500	3,980,000	22,338,001	15.11	8.500	3,205,000	19,762,186	**12.73**
Toma concrit	0.880	23,375			0.890	22,000		
Mathergonj	7.400	3,259,000			7.500	2,909,000		
Baxigonj JSL	0.270	266,750			0.280	313,500		
Dawangonj-2	5.500	2,014,000			5.500	1,848,000		
Dawangonj-1	-	-			2.50	429,600		
Total	**63.576**	**26,313,375**			65.670	**22,645,724**		

Import point	May'18				June'18			
	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	10.000	3,290,000			10.000	3,722,000		
Sharishabari	11.000	2,821,500			11.000	4,628,250		
Sherpur	-	-			-	-		
Malandha	5.500	2,854,500			5.500	3,652,000		
Nurundi	7.000	1,712,000			7.000	2,583,000		
Baxigonj	5.500	1,945,000			5.500	2,796,000		
Islampur	8.500	2,272,000			8.500	2,831,000		
Toma concrit	0.890	24,750	17,272,025	18.30	0.890	14,533	20,122,391	**31.79**
Mathergonj	7.500	2,523,000			7.500	3,187,000		
Baxigonj JSL	0.280	261,250			0.280	165,000		
Dawangonj-2	5.500	2,006,000			5.500	2,744,000		
Dawangonj-1	2.500	1,206,240			2.500	1,787,040		
Narayonpur	3.500	197,400			3.500	1,392,000		
Tarakandi	2.500	28,320			2.50	-		
Total	**70.170**	**21,141,960**			70.170	**29,501,823**		

As per Sub-station Meter Data with Load Factor (2016-17) of JPBS

Import point	July'16				August'16			
	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(MW	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	9.225	4,287,000			9.125	3,815,000		
Sharishabari	7.300	3,212,000			7.100	2,805,000		
Sherpur	0.000	-			-	-		
Malandha	7.073	2,827,000			7.073	2,530,000		
Nurundi	4.600	1,959,000			4.550	1,861,500		
Baxigonj	5.420	1,955,630	18,840,820	16.12	5.352	1,573,790	18,417,426	**4.66**
Islampur	8.028	3,803,000			8.020	2,996,000		
Toma concrit	0.096	11,000			0.096	11,000		
Mathergonj	5.687	2,727,000			5.757	2,286,000		
Baxigonj JSL	0.330	32,010			0.330	165,413		
Dawangonj-2	5.303	1,647,705			5.200	1,274,937		
Total	**53.062**	**22,461,345**			52.603	**19,318,640**		

Import point	September'16				October'16			
	Peak Demand(MW	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(MW	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	9.459	3,892,000			9.972	3,499,000		
Sharishabari	7.530	2,926,000			7.530	2,733,500		
Sherpur	0.000	-			-	-		
Malandha	7.161	2,568,500			6.556	2,557,500		
nurundi	4.500	1,808,500			4.500	1,501,200		
Baxigonj	5.347	1,702,405	17,973,586	11.56	5.347	1,636,710	17,512,233	**9.08**
Islampur	8.244	3,256,000			7.521	3,236,000		
Toma concrit	0.072	9,625			0.089	13,750		
Mathergonj	6.341	2,537,000			5.489	2,507,000		
Baxigonj JSL	0.33	129,773			0.371	204,985		
Dawangonj-2	4.817	1,492,930			4.52	1,371,809		
Total	**53.801**	**20,322,733**			51.892	**19,261,454**		

Import point	November'16				December'16			
	Peak Demand(MW	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(MW	Unit kWh(Purchase)	Total KWh(sold)	Substatio n SL %
Jamalpur	9.921	3,003,000			8.521	3,240,000		
Sharishabari	7.529	2,282,500			7.129	2,381,500		
Sherpur	0.000	-			4.109	-		
Malandha	5.148	2,223,606			5.148	2,121,394		
nurundi	3.500	1,447,130			3.500	1,499,000		
Baxigonj	4.109	1,522,310	16,572,247	3.72	0.000	1,536,050	15,183,097	**12.48**
Islampur	6.629	2,966,000			6.629	2,676,000		
Toma concrit	0.089	13,750			0.089	13,750		
Mathergonj	6.000	2,110,000			6.000	2,163,000		
Baxigonj JSL	0.375	214,803			0.375	209,523		
Dawangonj-2	3.200	1,428,902			3.200	1,508,174		
Total	**46.500**	**17,212,001**			44.700	**17,348,391**		

Import point	January'17				February'17			
	Peak Demand(MW	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(MW	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	8.471	3,874,000			8.851	3,908,000		
Sharishabari	7.529	3,190,000			7.529	3,157,000		
Sherpur	0.000	-			-	-		
Malandha	5.148	2,706,000			5.148	2,755,500		
Nurundi	3.500	1,932,000			3.996	2,205,737		
Baxigonj	4.109	1,607,770	18,485,527	11.84	4.172	1,615,970	19,102,994	**6.14**
Islampur	6.629	3,451,000			6.963	3,033,000		
Toma concrit	0.890	13,750			0.890	9,625		
Mathergonj	6.000	2,502,000			6.000	2,313,000		
Baxigonj JSL	0.375	200,998			0.375	175,203		
Dawangonj-2	3.200	1,490,438			3.20	1,178,613		
Total	**45.851**	**20,967,956**			47.124	**20,351,648**		

Import point	March'16				April'17			
	Peak Demand(MW	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(MW	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	10.851	3,335,000			9.105	3,071,000		
Sharishabari	7.529	3,589,713			13.560	2,780,250		
Sherpur	0.000	-			-	-		
Malandha	5.148	3,102,000			5.278	2,590,500		
nurundi	3.996	2,107,000			4.715	1,925,000		
Baxigonj	4.172	1,904,100	19,745,884	10.87	4.172	1,619,360	16,778,228	**12.01**
Islampur	6.963	3,687,000			6.974	3,107,000		
Toma concrit	0.089	9,913			0.089	6,586		
Mathergonj	6.000	2,719,289			6.400	2,535,711		
Baxigonj JSL	0.375	206,277			0.375	201,520		
Dawangonj-2	3.200	1,494,147			3.20	1,232,210		
Total	**48.323**	**22,154,439**			53.868	**19,069,137**		

Import point	May'17				June'17			
	Peak Demand(M	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(MW	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	9.500	2,999,000			11.105	4,230,353		
Sharishabari	13.500	2,662,110			13.560	3,442,890		
Sherpur	0.000	-			-	-		
Malandha	5.200	2,469,500			5.148	2,860,000		
Nurundi	5.000	1,934,574			4.715	2,069,535		
Baxigonj	6.000	1,403,290	14,880,345	18.38	5.755	1,833,080	17,622,047	**25.08**
Islampur	6.900	3,096,000			6.963	4,144,000		
Toma concrit	0.890	6,875			0.890	11,000		
Mathergonj	6.000	2,276,000			6.000	2,980,000		
Baxigonj JSL	0.375	200,338			0.375	178,668		
Dawangonj-2	5.250	1,183,230			5.02	1,773,030		
Total	**58.615**	**18,230,917**			59.527	**23,522,556**		

As per Sub-station Meter Data with Load Factor (2015-16) of JPBS

Import point	July'15				August'15			
	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(M	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	7.875	3,780,000			7.124	3,877,000		
Sharishabari	7.490	3,025,000			6.575	2,992,000		
Sherpur	0.000	-			-	-		
Malandha	6.424	2,673,000			6.425	2,794,000		
nurundi	4.062	2,067,000			4.01	1,540,000		
Baxigonj	6.508	2,920,250	15,190,538	24.12	6.325	2,922,520	16,818,302	**13.39**
Islampur	6.778	3,394,000			6.724	3,213,000		
Toma concrit	0.176	15,125			0.126	16,500		
Mathergonj	4.500	2,145,000			4.015	2,062,500		
Nandina	0	-			0	0		
Bazrapur	0.000	-			-	0		
Total	**43.813**	**20,019,375**			41.324	**19,417,520**		

Import point	September'15				Import point	October'15			
	Peak Demand(M	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %		Peak Demand(MW	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	8.556	3,818,000			Jamalpur	8.556	3,294,785		
Sharishabari	7.110	2,942,500			Sharishabari	7.447	2,542,375		
Sherpur	-	-			Sherpur	-	-		
Malandha	6.473	2,689,500			Malandha	6.468	2,728,000		
Nurundi	3.544	1,577,000			Nurundi	3.546	1,524,140		
Baxigonj	6.613	3,024,510	16,449,584	15.00	Baxigonj	6.613	2,771,100	17,165,091	**5.15**
Islampur	7.406	3,283,000			Islampur	7.735	3,312,150		
Toma concrit	0.126	12,375			Toma concrit	0.126	13,750		
Mathergonj	5.106	2,004,750			Mathergonj	4.175	1,830,675		
Nandina	-	-			Boxigonj JSL	0	79,475		
Bazrapur	-	-			Bazrapur	-	-		
Total	**44.934**	**19,351,635**			**Total**	44.666	**18,096,450**		

Import point	November'15				December'15			
	Peak Demand(MW	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(M	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	7.043	2,572,215			8.556	2,956,000		
Sharishabari	7.500	2,028,125			5.478	2,112,000		
Sherpur	0.000	-			-	-		
Malandha	6.780	1,952,500			4.757	2,068,000		
nurundi	4.100	1,150,860			3.544	1,250,000		
Baxigonj	6.800	2,418,610	13,836,431	2.42	6.221	2,521,770	13,026,092	**13.17**
Islampur	7.800	2,452,000			5.698	2,496,000		
Toma concrit	0.126	12,375			0.088	16,500		
Mathergonj	4.500	1,411,575			4.500	1,410,750		
Baxigonj JSL	0.385	180,730			0.388	170,940		
Bazrapur	0.000	-			-	-		
Total	**45.034**	**14,178,990**			**39.230**	**15,001,960**		

Import point	January'16				February'16			
	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(MW)	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	7.043	3,376,000	15,855,483	13.34	8.146	3,632,000	18,959,585	**8.50**
Sharishabari	7.500	2,981,000			7.500	3,410,000		
Sherpur	0.000	-			-	-		
Malandha	6.780	2,739,000			6.780	3,025,000		
nurundi	4.100	1,557,000			4.100	2,078,000		
Baxigonj	6.800	2,631,890			6.800	2,937,170		
Islampur	7.800	3,082,000			7.136	3,299,000		
Toma concrit	0.126	12,375			0.126	12,375		
Mathergonj	4.500	1,745,387			4.500	2,157,006		
Baxigonj JSL	0.385	170,910			0.385	171,242		
Bazrapur	-	-			-	-		
Total	**45.034**	**18,295,562**			45.473	**20,721,793**		

Import point	March'16				April'16			
	Peak Demand(M	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(M	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	8.546	3,543,000	19,283,140	12.14	8.146	3,469,000	17,309,041	**15.50**
Sharishabari	7.600	3,586,000			7.100	3,294,500		
Sherpur	0.000	-			-	-		
Malandha	6.800	2,970,000			7.055	2,783,000		
nurundi	4.600	2,725,000			5.400	2,186,000		
Baxigonj	6.400	2,084,380			5.848	1,612,090		
Islampur	7.536	3,522,000			7.900	3,328,000		
Toma concrit	0.126	9,625			0.126	11,000		
Mathergonj	4.500	2,543,000			5.200	2,553,000		
Baxigonj JSL	0.385	162,608			0.385	139,370		
Dawangonj-2	4.500	802,807			3.10	1,107,883		
Total	**50.993**	**21,948,420**			50.256	**20,483,843**		

Import point	May'16				June'16			
	Peak Demand(M	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %	Peak Demand(M	Unit kWh(Purchase)	Total KWh(sold)	Substation SL %
Jamalpur	8.146	3,241,000	14,313,877	16.89	8.437	3,777,000	15,940,792	**18.09**
Sharishabari	7.623	2,249,500			7.623	2,777,500		
Sherpur	0.000	-			-	-		
Malandha	5.605	2,238,500			5.951	2,414,500		
nurundi	4.600	1,516,500			4.600	1,690,000		
Baxigonj	5.848	1,410,560			4.911	1,655,950		
Islampur	8.500	3,023,000			7.500	3,239,000		
Toma concrit	0.096	13,750			0.096	12,375		
Mathergonj	5.660	2,192,000			5.737	2,398,000		
Baxigonj JSL	0.398	158,235			0.429	110,688		
Dawangonj-2	4.271	1,180,602			4.27	1,386,173		
Total	**50.747**	**17,223,647**			49.555	**19,461,186**		

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SL. No	Particulars	July'17	August'17	September'17	October'17	November'17	December'17
	Operating Revenue						
1	Sales of electricity	120,608,314.00	121,271,754.00	130,697,928.00	118,078,656.00	103,799,263.00	99,901,860.00
2	Other operating revenue	2,404,123.20	2,373,059.20	3,005,763.20	3,795,640.00	3,493,969.00	3,747,652.80
3	Total operating revenue (1+2)	123,012,437.20	123,644,813.20	133,703,691.20	121,874,296.00	107,293,232.00	103,649,512.80
4	Cost of purchased power	123,687,673.00	125,917,293.00	124,195,393.00	108,305,551.00	68,936,799.00	85,569,690.00
5	Distribution Expenses -Operating & Maintenance	8,388,167.39	11,508,306.98	8,663,887.56	8,074,993.87	8,337,654.05	9,681,112.27
6	Consumer Selling expenses	8,256,373.80	12,430,789.00	8,580,597.25	8,452,960.25	8,305,785.00	9,694,458.00
7	Administration & General Expenses	5,267,975.00	6,791,569.31	6,018,863.75	5,731,721.50	5,371,962.60	6,653,892.00
8	Total operating & General expenses (6 to 8)	145,600,189.19	156,647,958.29	147,458,741.56	130,565,226.62	90,952,200.65	111,599,152.27
9	Depreciation & Amortization expenses	35,398,288.00	24,995,815.00	18,876,145.00	18,915,104.00	20,599,107.00	20,656,207.00
10	Tax expenses	132,270.00	455,560.00	516,130.00	1,714,897.00	578,760.00	1,007,315.29
11	Interest on long term loan	6,107,000.00	6,107,000.00	6,107,000.00	6,107,000.00	6,107,000.00	7,536,354.00
12	Total cost of electric service (9+10+11+12)	187,237,747.19	188,206,333.29	172,958,016.56	157,302,227.62	118,237,067.65	140,799,028.56
13	Operating profit/Margin (5-13)	(64,225,309.99)	(64,561,520.09)	(39,254,325.36)	(35,427,931.62)	(10,943,835.65)	(37,149,515.76)
14	Government Subsidy	0.00	0.00	0.00	0.00	0.00	0.00
15	Non-operating margins-interest	242,255.88	394,272.00	5,064,796.92	(161,053.00)	(126,085.12)	6,409,165.69
16	Non-operating margins-others	456,190.00	346,446.00	382,481.00	427,465.00	1,202,323.00	339,134.00
17	Net Profit/Margin (14+15+16+17)	(63,526,864.11)	(63,820,802.09)	(33,807,047.44)	(35,161,519.62)	(9,867,597.77)	(30,401,216.07)

SL. No	Particulars	January'18	February'18	March'18	April'18	May'18	June'18
	Operating Revenue						
1	Sales of electricity	105,966,124.00	112,813,926.00	118,016,582.00	109,091,741.00	101,313,937.00	117,073,556.00
2	Other operating revenue	9,182,479.50	4,237,183.25	3,700,552.00	6,829,761.00	7,055,143.00	30,835,344.50
3	Total operating revenue (1+2)	115,148,603.50	117,051,109.25	121,717,134.00	115,921,502.00	108,369,080.00	147,908,900.50
4	Cost of purchased power	77,147,650.00	106,909,676.00	89,862,790.00	70,960,224.00	114,571,776.00	42,453,009.00
5	Distribution Expenses -Operating & Maintenance	6,289,240.17	8,050,595.00	8,220,626.46	7,067,730.99	10,767,781.16	6,949,961.27
6	Consumer Selling expenses	8,679,239.75	14,148,791.25	10,744,477.00	8,918,366.25	13,724,232.50	10,064,688.75
7	Administration & General Expenses	6,174,690.00	9,533,276.80	6,835,876.39	5,534,550.51	8,059,647.64	38,170,539.68
8	Total operating & General expenses (6 to 8)	98,290,819.92	138,642,339.05	115,663,769.85	92,480,871.75	(82,020,114.70)	97,638,198.70
9	Depreciation & Amortization expenses	20,689,913.00	20,758,017.00	20,852,335.00	21,400,703.00	21,520,906.00	4,954,852.00
10	Tax expenses	441,187.00	352,070.00	864,755.00	952,706.00	411,340.00	641,017.00
11	Interest on long term loan	6,345,225.00	6,345,225.00	6,345,225.00	6,345,225.00	34,553,701.00	0.00
12	Total cost of electric service (9+10+11+12)	125,767,144.92	166,097,651.05	143,726,084.85	121,179,505.75	(25,534,167.70)	103,234,067.70
13	Operating profit/Margin (5-13)	(10,618,541.42)	(49,046,541.80)	(22,008,950.85)	(5,258,003.75)	133,903,247.70	44,674,832.80
14	Government Subsidy	0.00	0.00	0.00	0.00	0.00	0.00
15	Non-operating margins-interest	510,978.70	(144,187.79)	4,802,310.00	(77,432.59)	(147,140.43)	9,597,329.19
16	Non-operating margins-others	357,713.00	466,699.00	406,125.00	393,805.00	286,961.00	205,849.00
17	Net Profit/Margin (14+15+16+17)	(9,749,849.72)	(48,724,030.59)	(16,800,515.85)	(4,941,631.34)	134,043,068.27	54,478,010.99

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SL. No	Particular	July'16	August'16	September'16	October'16	November'16	December'16
	Operating Revenue						
1	Sales of electricity	105,870,278.00	106,145,739.00	100,933,256.00	98,222,462.00	94,629,119.00	89,007,951.00
2	Other operating revenue	1,564,978.00	2,407,664.00	2,341,639.00	2,943,052.00	3,156,829.00	3,305,629.00
3	Total operating revenue (1+2)	107,435,256.00	108,553,403.00	103,274,895.00	101,165,514.00	97,785,948.00	92,313,580.00
4	Cost of purchased power	106,084,012.00	90,840,512.00	95,450,440.00	90,724,985.00	79,500,604.00	80,843,184.00
5	Distribution Expenses -Operating & Maintenance	6,833,365.72	9,431,424.87	7,549,999.22	7,389,770.28	7,594,276.72	9,899,766.87
6	Consumer Selling expenses	8,422,829.00	12,534,655.00	8,745,314.00	7,941,353.00	7,926,851.00	9,366,639.00
7	Administration & General Expenses	5,117,553.54	7,128,078.85	5,916,882.00	5,833,003.54	5,712,067.31	6,645,123.42
8	Total operating & General expenses (4 to 8)	126,457,760.26	119,934,670.72	117,662,635.22	111,889,111.82	100,733,799.03	106,754,713.29
9	Depreciation & Amortization expenses	25,434,389.00	27,194,841.00	29,271,905.00	16,149,547.00	16,955,055.00	16,510,771.00
10	Tax expenses	199,000.00	630,070.00	514,360.00	643,456.00	408,225.00	1,115,980.00
11	Interest on long term loan	5,365,462.00	5,365,462.00	5,365,462.00	5,365,462.00	5,365,462.00	9,623,542.00
12	Total cost of electric service (9+10+11+12)	157,456,611.26	153,125,043.72	152,814,362.22	134,047,576.82	123,462,541.03	134,005,006.29
13	Operating profit/Margin (3-13)	(50,021,355.26)	(44,571,640.72)	(49,539,467.22)	(32,882,062.82)	(25,676,593.03)	(41,691,426.29)
14	Government Subsidy	0.00	0.00	0.00	0.00	0.00	0.00
15	Non-operating margins-interest	(14,425.17)	424,486.92	5,162,922.48	82,099.64	212,906.37	5,950,829.74
16	Non-operating margins-others	254,202.00	504,910.00	343,704.00	453,163.00	419,829.00	451,756.20
17	Net Profit/Margin (14+15+16+17)	(49,781,578.43)	(43,642,243.80)	(44,032,840.74)	(32,346,800.18)	(25,043,857.66)	(35,288,840.35)

SL. No	Particular	January'17	February'17	March'17	April'17	May'17	June'17
	Operating Revenue						
1	Sales of electricity	100,525,468.00	100,477,971.00	104,341,660.00	93,332,535.00	87,190,019.00	99,788,192.00
2	Other operating revenue	4,576,548.00	2,887,432.00	3,042,480.15	2,635,195.50	2,789,209.20	3,999,296.75
3	Total operating revenue (1+2)	105,102,016.00	103,365,403.00	107,384,140.15	95,967,730.50	89,979,228.20	103,787,488.75
4	Cost of purchased power	68,095,366.00	97,124,728.00	70,367,597.00	67,905,593.00	53,944,413.00	29,355,807.00
5	Distribution Expenses -Operating & Maintenance	6,792,360.30	8,262,201.45	8,881,602.23	9,797,345.07	9,011,153.90	14,946,317.95
6	Consumer Selling expenses	8,594,854.00	8,469,340.00	9,751,075.85	14,335,815.00	8,362,749.00	12,394,743.00
7	Administration & General Expenses	5,934,450.96	5,655,656.98	5,747,332.00	7,527,812.00	5,932,496.00	36,313,715.00
8	Total operating & General expenses (4 to 8)	89,417,031.26	119,511,926.43	94,747,607.08	99,566,565.07	77,250,811.90	93,010,582.95
9	Depreciation & Amortization expenses	12,235,152.00	16,786,656.00	16,800,437.00	15,910,329.00	16,939,584.00	(6,012,591.00)
10	Tax expenses	445,842.00	140,520.00	787,540.00	336,209.00	389,330.00	631,163.00
11	Interest on long term loan	6,075,000.00	6,075,000.00	6,075,000.00	6,075,000.00	6,075,000.00	6,267,787.00
12	Total cost of electric service (9+10+11+12)	108,173,025.26	142,514,102.43	118,410,584.08	121,888,103.07	100,654,725.90	93,896,941.95
13	Operating profit/Margin (3-13)	(3,071,009.26)	(39,148,699.43)	(11,026,443.93)	(25,920,372.57)	(10,675,497.70)	9,890,546.80
14	Government Subsidy	0.00	0.00	0.00	0.00	0.00	0.00
15	Non-operating margins-interest	151,846.17	329,930.15	4,501,982.00	(63,815.18)	173,305.75	8,953,466.84
16	Non-operating margins-others	446,719.00	357,103.00	327,325.00	542,755.00	299,309.00	495,570.00
17	Net Profit/Margin (14+15+16+17)	(2,472,444.09)	(38,461,666.28)	(6,197,136.93)	(25,441,432.75)	(10,202,882.95)	19,339,583.64

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SL. No	Particular	July'15	August'15	September'15	October'15	November'15	December'15
	Operating Revenue						
1	Sales of electricity	84,313,506.00	93,370,361.00	91,696,290.00	95,582,661.00	80,591,560.00	76,156,261.00
2	Other operating revenue	1,288,790.45	2,287,180.00	1,904,047.00	3,386,159.00	4,447,998.25	3,666,312.40
3	Total operating revenue (1+2)	85,602,296.45	95,657,541.00	93,600,337.00	98,968,820.00	85,039,558.25	79,822,573.40
4	Cost of purchased power	86,287,645.00	85,230,316.00	90,351,495.00	83,943,402.00	66,746,650.00	69,449,328.00
5	Distribution Expenses -Operating & Maintenance	7,109,809.93	4,696,030.39	7,350,550.40	5,528,201.48	5,160,360.52	5,975,613.76
6	Consumer Selling expenses	9,263,212.00	5,749,561.00	8,333,337.00	6,549,488.00	5,925,487.00	6,745,265.00
7	Administration & General Expenses	4,642,683.00	3,360,437.00	4,446,234.60	3,877,941.00	3,846,279.31	4,450,618.72
8	Total operating & General expenses (4 to 8)	107,303,349.93	99,036,344.39	110,481,617.00	99,899,032.48	81,678,776.83	86,620,825.48
9	Depreciation & Amortization expenses	19,125,336.00	12,118,545.00	11,888,960.00	12,303,627.00	12,398,437.00	12,553,758.00
10	Tax expenses	192,420.00	0.00	16,000.00	1,854,760.00	557,070.00	83,350.00
11	Interest on long term loan	5,335,000.00	5,335,000.00	5,335,000.00	5,335,000.00	5,335,000.00	5,517,773.00
12	Total cost of electric service (9+10+11+12)	131,956,105.93	116,489,889.39	127,721,577.00	119,392,419.48	99,969,283.83	104,775,706.48
13	Operating profit/Margin (3-13)	(46,353,809.48)	(20,832,348.39)	(34,121,240.00)	(20,423,599.48)	(14,929,725.58)	(24,953,133.08)
14	Government Subsidy	0.00	0.00	0.00	0.00	0.00	0.00
15	Non-operating margins-interest	492,407.00	648,357.00	6,339,979.00	168,684.00	371,025.00	7,688,048.15
16	Non-operating margins-others	587,322.00	806,119.00	594,386.00	669,522.00	512,506.00	329,299.00
17	Net Profit/Margin (14+15+16+17)	(45,274,080.48)	(19,377,872.39)	(27,186,875.00)	(19,585,393.48)	(14,046,194.58)	(16,935,785.93)

SL. No	Particular	January'16	February'16	March'16	April'16	May'16	June'16
	Operating Revenue						
1	Sales of electricity	85,846,734.00	97,439,105.00	98,091,045.00	90,998,688.00	81,621,018.00	90,564,573.00
2	Other operating revenue	3,685,472.05	2,314,957.00	2,458,122.35	2,510,923.84	3,313,285.00	22,099,901.60
3	Total operating revenue (1+2)	89,532,206.05	99,754,062.00	100,549,167.35	93,509,611.84	84,934,303.00	112,664,474.60
4	Cost of purchased power	84,851,291.00	96,136,410.00	103,305,036.00	97,243,461.00	80,711,040.00	(138,397,510.00)
5	Distribution Expenses -Operating & Maintenance	6,385,696.35	4,255,780.11	4,176,055.48	6,095,933.07	12,848,284.67	16,177,118.85
6	Consumer Selling expenses	11,579,873.75	5,939,246.00	6,081,599.00	6,714,283.00	6,074,788.50	14,861,069.00
7	Administration & General Expenses	6,962,612.00	4,408,980.31	2,774,861.04	4,560,233.00	3,930,898.41	37,294,432.40
8	Total operating & General expenses (4 to 8)	109,779,473.10	110,740,416.42	116,337,551.52	114,613,910.07	103,565,011.58	(70,064,889.75)
9	Depreciation & Amortization expenses	12,685,560.00	12,784,142.00	12,851,218.00	13,624,829.00	13,676,797.00	(22,507,581.00)
10	Tax expenses	129,944.18	590,016.60	1,145,449.22	438,322.00	205,100.00	1,157,630.00
11	Interest on long term loan	5,365,462.00	5,365,462.00	5,365,462.00	5,365,462.00	5,365,462.00	9,418,610.00
12	Total cost of electric service (9+10+11+12)	127,960,439.28	129,480,037.02	135,699,680.74	134,042,523.07	122,812,370.58	(81,996,230.75)
13	Operating profit/Margin (3-13)	(38,428,233.23)	(29,725,975.02)	(35,150,513.39)	(40,532,911.23)	(37,878,067.58)	194,660,705.35
14	Government Subsidy	0.00	0.00	0.00	0.00	0.00	0.00
15	Non-operating margins-interest	398,413.00	306,854.06	6,340,034.32	395,850.60	99,705.74	10,398,559.70
16	Non-operating margins-others	513,628.00	304,755.00	366,490.00	329,512.00	327,740.20	315,939.00
17	Net Profit/Margin (14+15+16+17)	(37,516,192.23)	(29,114,365.96)	(28,443,989.07)	(39,807,548.63)	(37,450,621.64)	205,375,204.05

APPENDIX-D

According to REB:

Distribution Cost (10^7 Tk), 2017-2018

OME												
July	August	September	Octeber	November	December	January	February	March	April	May	June	Grand Total
0.839	1.151	0.866	0.807	0.834	0.968	0.629	0.805	0.822	0.707	1.077	0.695	10.200

Cost of Electric Service (10^7 Tk), 2017-2018

Month	CSE	AGE	DAE	TE	IE
July	0.826	0.527	3.540	0.013	0.611
August	1.243	0.679	2.500	0.046	0.611
September	0.858	0.602	1.888	0.052	0.611
October	0.845	0.573	1.892	0.171	0.611
November	0.831	0.537	2.060	0.058	0.611
December	0.969	0.665	2.066	0.101	0.754
January	0.868	0.617	2.069	0.044	0.635
February	1.415	0.953	2.076	0.035	0.635
March	1.074	0.684	2.085	0.086	0.635
April	0.892	0.553	2.140	0.095	0.635
May	1.372	0.806	2.152	0.041	3.455
June	1.006	3.817	0.495	0.064	0.000
Grand total	**12.200**	**11.014**	**24.962**	**0.807**	**9.801**
Cost of Electric Service(10^7Tk) = 58.784					

Distribution Cost (10^7 Tk), 2016-2017

OME												
July	August	Septembe	Octeber	Novembe	Decembe	January	February	March	April	May	June	Grand Total
0.683	0.943	0.760	0.739	0.759	0.990	0.679	0.826	0.888	0.980	0.901	1.495	10.643

Cost of Electric Service (10^7 Tk), 2016-2017

Month	CSE	AGE	DAE	TE	IE
July	0.842	0.512	2.543	0.020	0.537
August	1.253	0.713	2.719	0.063	0.537
September	0.875	0.592	2.927	0.051	0.537
October	0.794	0.583	1.615	0.064	0.537
November	0.793	0.571	1.696	0.041	0.537
December	0.937	0.665	1.651	0.112	0.962
January	0.859	0.593	1.224	0.045	0.608
February	0.847	0.566	1.679	0.014	0.608
March	0.975	0.575	1.680	0.079	0.608
April	1.434	0.753	1.591	0.034	0.608
May	0.836	0.593	1.694	0.039	0.608
June	1.239	3.631	(0.601)	0.063	0.627
Grand total	**11.685**	**10.346**	**20.418**	**0.624**	**7.309**
Cost of Electric Service(10^7Tk) = 50.382					

Distribution Cost (10^7 Tk), 2015-2016

OME												
July	August	September	Octeber	November	December	January	February	March	April	May	June	Grand Total
0.711	0.470	0.735	0.553	0.516	0.598	0.639	0.426	0.418	0.610	1.285	1.618	8.579

Cost of Electric Service (10^7 Tk), 2015-2016

Month	**CSE**	**AGE**	**DAE**	**TE**	**IE**
July	0.926	0.464	1.913	0.019	0.534
August	0.575	0.336	1.212	0.000	0.534
September	0.833	0.445	1.189	0.002	0.534
October	0.655	0.388	1.230	0.185	0.534
November	0.593	0.385	1.240	0.056	0.534
December	0.675	0.445	1.255	0.008	0.552
January	1.158	0.696	1.269	0.013	0.537
February	0.594	0.441	1.278	0.059	0.537
March	0.608	0.277	1.285	0.115	0.537
April	0.671	0.456	1.362	0.044	0.537
May	0.607	0.393	1.368	0.021	0.537
June	1.486	0.373	(2.251)	0.116	0.942
Grand total	**9.382**	**5.099**	**12.350**	**0.637**	**6.844**
Cost of Electric Service(10^7Tk) = 34.312					