FINAL REPORT ON "CUSTOMER SATISFACTION SURVEY WITH RECOMMENDATION OF QUALITY POWER SUPPLY INCLUDING SAIDI/SAIFI" *[CONTRACT PACKAGE NO.: S-12]*

Submitted to:

Power Cell

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ACKNOWLEDGEMENT

Uninterrupted electricity is the major ingredients for socio-economic development of a country. The Government's vision is to provide quality electricity in a cost-effective and affordable manner as well as ensure reliable electricity for all. In this regard, the Government's targeted to installed capacity of 24,000 MW, which has been already achieved. When the present Government took power in 2009 installed power generation capacity was 4,942 MW which is now 26,550 MW. Currently, Bangladesh has surplus electricity compared to the demand. It may be mentioned that during the last twelve years about 4.48 million new consumers were connected to electricity. As well as access to electricity increased from 47% to 100% Per capita generation is also increased from 220 KWh to 608.76 KWh.

Many good initiatives are taken in power sector but sometimes, consumers may face interruption of power due to network constraint. Whatever the reason by nature of the product, people can't accept the absence of electricity even for a moment. Although the customer service is improved significantly, still it requires more attention and initiatives for further service improvement to fulfil the customer's expectation. Major expectations of the customers are - minimum interruption and load shedding, quick service restoration, easy bill payment, amicable and fast settlement against the lodged complain and other service assistance. Bangladesh Government keenly intended to engage a competent consultant through a competitive bidding to carry out the public perception survey on Customer Satisfaction with recommendation of quality power supply including SAIDI/SAIFI to know the ins and outs of the present status of the power sector.

The Power Cell, Power Division under the Ministry of Power, Energy and Mineral Resources, Government of the People's Republic of Bangladesh awarded the assignment to MIDAS after judiciously vetting and considering it submitted Technical and Financial Proposals. Accordingly, an agreement has been signed by Engr. Mohammad Hossain, Director General, Power Cell, Power Division, Ministry of Power, Energy, Government of the People's Republic of Bangladesh and Mineral Resources and Dr. A.S.M. Mashi-ur-Rahman, Managing Director of MIDAS on 29th December 2022.

MIDAS Team extends its heartfelt gratitude to Power Cell under Ministry of Power, Energy and Mineral Resources, Government of the People's Republic of Bangladesh for awarding this assignment. MIDAS Team has carried out the Customer Satisfaction Survey under BPDB, BREB DPDC, DESCO, NESCO and WZPDCL through a structured questionnaire based on the objectives and scope of work mentioned in the TOR. It has been an extremely gratifying experience for MIDAS Team. MIDAS Team geared-up comprehensive procedures and activities to successfully accomplish the survey, Key Informant Interviews (KII), Focus Group Discussion (FGD), Case Study and SAIDI/SAIFI Analysis as per set-plan.

MIDAS Team takes the opportunity to thank all the Power Cell Officials involved in this project, Officials of Government, Non-Government Organisations and Respondents of covered areas for their whole hearted support in providing the required information.

As a Team Leader of this assignment, I am extremely grateful to the other members of the MIDAS Survey Team for their valuable inputs to make the customer satisfaction survey a success.

Dr. A.S.M. Mashi-Ur-Rahman
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Customer Satisfaction Survey with Recommendation of Quality Power Supply Including SAIDI/SAIFI in Power Sector
Power Cell, Power Division under Ministry of Power, Energy and Mineral Resources of Bangladesh, Government of Bangladesh

DIRECTOR GENERAL OF POWER CELL EXCHANGES SIGNED CONTACT DOCUMENT WITH MANAGING DIRECTOR OF MIDAS

PROJECT NAME: CUSTOMER SATISFACTION SURVEY WITH RECOMMENDATION OF QUALITY POWER SUPPLY INCLUDING SAIDI/SAIFI

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LIST OF ABBREVIATIONS

BPDB	Bangladesh Power Development Board
BREB	Bangladesh Rural Electrification Board
CAIDI	Customer Average Interruption Duration Index
DESCO	Dhaka Electric Supply Company Limited
DPDC	Dhaka Power Distribution Company Limited
DOFC	Drop out Fuse Cut out
FY	Fiscal Year
KPI	Key Performance Indicator
KV	kilovolt
DOFC	Drop out Fuse Cut-out
DPDC	Dhaka Power Distribution Company
DSS	Distribution Support Services
EHV	Extra High Voltage
FE	Field Enumerator
FGD	Focus Group Discussion
GP	General Power
HTI	High Tension Industry
IVR	Incoming Voice Recorder
KII	Key Informant Interview
KPI	Key Performance Indicator
KWH	Kilowatt-hour
LA	Lightening Arrester
LP	Large Power
LTI	Low Tension Industry
MCB	Miniature Circuit Breaker
MCCB	Molded Case Circuit Breaker.
MIDAS	Micro Industries Development Assistance and Services
MVGP	Medium Voltage for General Purpose
MW	Megawatt
NESCO	Northern Electricity Supply Company PLC
NLDC	National Load Dispatch Centre
NOCS	Network Operation Customer Service
PBS	Polly Biddut Somity
PC	Power Cell
PFI	Power Factor Improvement
PLF	Plant Load Factor
PGCB	Power Grid Organization/ Company of Bangladesh
PPG	Personal Protective Gears
QS	Questionnaire Survey
SAIFI	System Average Interruption Frequency Index
SAIDI	System Average Interruption Duration Index
STATA	Statistical Software for Data Science
SCADA	Supervisory Control and Data Acquisition
S&D	Sales & Distribution
SOP	Standard Operating Procedures
TOR	Terms of Reference
WZPDCL	West Zone Power Distribution Company

EXECUTIVE SUMMARY

INTRODUCTION

Uninterrupted electricity is the major ingredients for socio-economic development of a country. The Government's targeted to installed capacity of 24,000 MW, which has been already achieved. When the present Government took power in 2009 installed power generation capacity was 4,942 MW which is now 26,550 MW. Currently, Bangladesh has surplus electricity compared to the demand. It may be mentioned that during the last twelve years about 4.48 million new consumers were connected to electricity. As well as access to electricity increased from 47% to 100% Per capita generation has also increased from 220 KWh to 608.76 KWh.

In this context, Power Cell, Power Division, Ministry of Power, Energy and Mineral Resources, Government of the People's Republic of Bangladesh appointed MIDAS to carry out the customer satisfaction survey with recommendation of quality power supply including SAIDI/SAIFI analysis.

SURVEY COVERAGE

A total of different categories of 15,245 customers of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL were surveyed in Chittagong, Mymensingh, Narayanganj, Dhaka, Rangpur, Khulna and Satkhira districts.

Out of total 15,245 surveyed customers, 13,862 (90.93%) were from Residential Category, 135 (0.89%) from Industrial Category, 1220 (8%) from commercial Category and 28 (0.18%) from Irrigation Category. Total Sample Customers were distributed as follows-BPDB (2,868), BREB (2256), DESCO (4282), DPDC (2,186), NESCO (1322) and WZPDCL (2331).

SURVEY FINDINGS

CHARACTERISTICS OF SAMPLED CUSTOMERS

A total (Residential, Industrial+LP, Commercial and Irrigation) of 2,868 customers (18.81%) were selected from BPDB, 2256 customers (14.80%) from BREB, 4282 customers (28.09%) from DESCO, 2,186 customers (14.34%) from DPDC, 1322 customers (8.67%) from NESCO and from WZPDCL 2331 customers (15.29%) were selected for interview.

GENERAL INFORMATION

1. **Gender of the Customers Interviewed:** 64.21% were male, 35.78% were female and 0.01% were transgender.

2. **Type of Utility Billing Meter:** Pre-paid (7929, 52.01%) and Post-paid (73161, 47.99%). Pre-paid meter is 4.02% higher than the post-paid meter amongst the six utilities.

3. **Status of Customers Interviewed:** Residential class 13,861 (90.92%), Industrial class 136 (0.89%), Commercial Class 1,220 (8%) and Irrigation class 28 (0.18%).

POWER CONNECTION

1. **Year of Power Connection:** Most of the surveyed customers (39.46%) were received their power connection within 1-10 years, while 25.79% customers were received the connection within 11-20 years.

2. **Status of Assistance received from power distribution Organization/ Company:** Satisfaction level with regard to assistance received is 92.74%.

3. **Additional Payment besides the fixed Government fees for getting new power connection:** 90.78% customers said 'No', they did not pay any type of additional money for getting new power connection, while 7.64% customers said 'Yes' and 1.58% customers mentioned 'No response'.

ELECTRICITY SERVICES

1. **Status of received Electricity Services:** Satisfaction level with these regards is 93.81%.

2. **Status regarding uninterrupted power supply:** 65.00% customers said 'Yes', while 34.38% customers said 'No' and 0.62% customers said 'No response'.

3. **Duration of Power Outage per day:** The 58.00% customers stated that Duration of Power Outage per day within '0-0.5 hour', while 20.79% customers stated that Duration of Power Outage per day within '0.6-1.0 hour'.

4. **Number of power outage per day:** 46.11% stated that the number of power outage per day is '0 time', while 13.96% customers stated that the number of power outage per day '1 time'.

5. **Duration of Power per Outages:** 36.12% customers mentioned '26-30 minutes', while 14.51% customers mentioned '16-20 minutes' and 12.69% mentioned '11-15 minutes".

6. **Status of Voltage Fluctuation:** 67.69% customers said 'No', while 32.23% customers said 'Yes' and only 0.09% customers said 'No response' to the question.

7. **Time of Voltage Fluctuation:** 37.63% of the respondents seriously mentioned the Time of Voltage Fluctuation as 'Evening', while 27.84% respondents mentioned as 'Noon' followed by 19.68% (Night), 8.47% (Afternoon) and 6.37% (Morning).

8. **Power distribution Organization/ Company takes necessary measures to supply power quickly in case of power outage due to natural calamities:** 94.62% customers said 'Yes', while 5.23% customers said 'No' and 0.15% customers said 'No response' to the question.

ELECTRICITY BILL AND METER READING (ONLY FOR POST-PAID METER)

1. **Status of Regular Meter reading by the Meter Reader per Month:** 96.23% customers said 'Yes', while 3.18% customers said 'No' and only 0.59% customers 'No response' to the question.

2. **Status of Satisfaction regarding service and behaviour of meter reader:** Satisfaction level in these regards is 93.83%.

3. **Status Regarding arrears electricity bills with next month's bill:** 92.26% mentioned with regard to the Status of the arrear's electricity bills with next month's bill as 'No', on the other hand 7.20% stated as 'Yes' and rest of the respondents (0.53%) mentioned as 'No Response'.

4. **Customer's Opinion regarding arrears electricity bills with next month's bill:** Satisfaction level in these regards is 94.34%.

5. **Perception of customer on getting monthly bill before the deadline of payment:** 97.48% of the total respondents replied 'Yes' that they had received a monthly bill before the payment date. On the other hand, 1.95% customers said 'No' and only 0.56% customers mentioned as 'No Response' to the question.

6. **Status of Satisfaction regarding getting monthly bill before the deadline of payment:** Satisfaction level in this regard is 97.08%.

7. **Opinion regarding the time given to pay the electricity bill in every month:** Satisfaction level in this regard is 95.59%.

8. **Status of Electricity bill payment through mobile or online:** 69.87% of the respondent mentioned 'Yes'. On the other hand, 29.58% respondents said 'No' and only 0.55% mentioned 'No Response' to the question.

9. **Status of medium for payment of electricity bill:** 68.32% mentioned the 'Bank', while 61.11% mentioned as 'bKash' followed by 18.01% "Office Booth", 12.84% "Nagad", 1.16% "Upay" and Only 0.26% mentioned "Others".

10. **Opinion regarding the payment of electricity bill through mobile/online:** Satisfaction level in this regard is 99.12%.

11. **Status of receiving annual clearance certificate of electricity bill payment:** 51.76% of the respondents mentioned 'No', they are not receiving annual clearance certificate, while 47.44% respondents mentioned 'Yes' and only 0.79% mentioned "No Response".

12. **Status of time of receiving the annual clearance certificate of electricity bill payment:** 30.37% mentioned in 'February', while 22.56% mentioned in 'March'. Others mentioned in 'December' (11.21%).

COMPLAINTS AND REMEDIES

1. **Status of Lodged complaints:** 92.97% mentioned 'Yes', we lodged complaints, while 6.96% mentioned 'No' and only 0.7% (No Response).

2. **Types of Complaints:** 64.21% mentioned their complaints as 'Interruption of Electricity', while 34.65% customer mentioned complaints as 'Load Shedding'.

3. **Types of Medium used for lodging Complaints:** 83.54% lodged complaints over 'Telephone/Mobile Phone', while 50.07% customer complaint lodged 'Directly to Complain Centre'.

4. **Status of received service within the desired time:** 92.97% stated 'Yes', they received the services within the desired time from the six utilities, while 5.52% of the customers mentioned 'No Response' and only 1.52% stated 'No', they didn't receive the serviced as they desired.

5. **Status of the quality of received services:** Satisfaction level in this regard is 87.12%.

6. **Status of attention paid by the call centre's recipient against the lodged complaints:** 89.01% stated 'Yes', they paid full attention to our lodged complaints, while 6.51% stated as 'No Response' and only 4.48% stated 'No', they didn't pay their full attention to our lodged complaints.

7. **Status of the quality of attention paid by the call centre's recipient against the lodged complaints:** Satisfaction level in this regard is 83.22%.

8. **Quality of Solution provided by the Power Distribution Organizations/ Companies against the Lodged Complaints:** Satisfaction level in this regard is 84.4%.

9. **Level of satisfaction after obtaining the quality power compared to the past (In the context of Correct Voltage/ Uninterrupted Power Supply):** Satisfaction level in this regard is 97.35% which is the furthest better than past.

10. **Level of satisfaction against the current improvement of the power distribution system:** Satisfaction level in this regard is 97.26% which is the furthest better than past.

11. **Status of the customer's specific complaints about the electricity distribution Organizations/ Companies:** 60.52% stated ‘Yes’, they have a specific complaint about the electricity distribution Organizations/ Companies, while 39.35% stated that as ‘No’ and only 0.12% stated as ‘No Response’.

12. **Status of the Customers Complaints (Multiple Response):** 37.64% customers focussed their complaints as ‘High electricity bill’, while 18.67% raised as ‘Load shedding’.

QUESTIONNAIRE REGARDING COMMUNICATION

1. **Status of the Customers Awareness about the 'Concerned authorities are always aware' to ensure the best customer service:** 56.62% said ‘No’, they don’t know about the slogan 'Concerned authorities are always aware' to ensure the best customer service, while 43.29% stated the same as ‘Yes’ and only 0.09% stated as ‘No Response’.

2. **The best way to communicate to the valued customer:** 46.30% of the valued customers stated their views as ‘Both’, while 42.16% of the valued customers focused on ‘Disseminate the information’ followed by 10.78% (Conducting regular meetings with customers) and only 0.75% of the customers stated as ‘No Response’.

3. **Opinion regarding the need of publicity for improving the public awareness regarding electricity usage and bill payment:** 97.81% stated as ‘Its Needed’, publicity is very important to improve the public awareness regarding electricity usage and bill payment, while 2.09% stated the same as ‘It's not Needed’ and only 0.10% stated as ‘No Response’.

4. **Effective media for campaigning (Multiple Response):** 81.10% considered TV Advertisement as the effecting media, while 61.26% considered Facebook as the effective media.

5. **List of Suggestions to Increase the Satisfaction of Electricity Customers:** 33.56% customers suggested as 'Have to reduce electricity cost', while 28.62%, recommended as 'Reduce load-shedding'.

SAIDI AND SAIFI RESULTS OF THE SIX UTILITIES

To verify the collected data of SAIDI and SAIFI from the six utilities for the FY 2019-2020, FY 2020-2021, FY 2021-2022, and 2022-2023 (up to March 2023) and critically analysed the same to derive the required results. To know the target vs achievement of SAIFI and SAIDI of each utility for the FY 2019-2020, FY 2020-2021, FY 2021-2022, and FY 2022-2023 checked the analytical results, generated analytical data tables and drawn the results figures. It is coming out from the analysis that SAIDI and SAIFI are improving in the FY 2019-2020 and FY 2020-2021 while the SAIDI and SAIFI value are increasing in the FY 2021-2022 and FY 2022-2023 (till March 2023). But these are within the range of fixed target.

OBSERVATION

The customers of different enumeration areas of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL were freely expressed their views for making the customer satisfaction survey in power sector more useful, effective and beneficial to all. These customer's satisfaction was considered quite germane to the electricity distribution entities in their areas, but found to be inadequate and insufficient to take care of all local needs of electricity. Some of the major observations of the survey are stated below.

Taking into consideration the increasing demand of the customers, the Costumer Service Centre needs to be more modernised by reshaping it as a self-sufficient one-stop digital service centre (24/7) with well-equipped communication facilities. It is also observed that most of the logistics are not in a good condition which are used by the Service Team (Line Gang). Hence, adequate modern and updated logistics need to be allocated considering the level of requirement and calculated workload.

Though the bill payment mechanism is improving than before, still the customers are suffering during paying their monthly electricity bill specially for the post-paid meter. Hence, payment mechanism needs to make easier for customers by setting more bill payment booths and options. But the Online billing system is currently very modern and transparent, which is better than before and the customer able to pay from home. Immediately convert the post-paid meter to pre-paid meter and install the pre-paid meter at the areas of six utilities to ensure hassle free service to the customers which

ultimately uphold the satisfaction level of the customers and augment the revenue generation.

Steps need to be taken to ensure that Clearance Certificate is provided on a yearly basis and onetime, which will keep the amicable relationship in between customers and the utilities department. Customers wanted sufficient power generation to reduce the load shedding to a minimum level to diminish their sufferings. Government should pay full attention in this regard. The prime expectation of the customer is uninterrupted power supply. Earlier load shedding was 10-12 times, but now load shedding is 1-2 times a day in the hot season and no load-shedding in winter. Due to shortage of manpower, Distribution Organizations/ Companies are unable to provide service on time. Skilled and technical manpower needs to increase for better customer service.

To provide quality and faster service, arrange a monitoring meeting on a regular basis to build strong relationship with customers. Information about maintenance and outage schedule through miking, messaging, social media notifications and SMS for customer awareness. Replace the overhead bare, hazardous and risky electricity line by insulated electricity line to make it safe. Due to road digging and construction work, the underground power supply line is disconnected and the utility customers are suffering. It needs to be done in coordination with the power distribution Organization/ Company.

CONCLUSION

The assignment was undertaken by the Power Cell, Ministry of Power, Energy & Mineral Resources for conducting customer satisfaction survey including SAIDI/SAIFI in power sector under BPDB, BREB, DPDC, DESCO, NESCO and WZPDCL, and scanning the conditions of utilities and their customers. Useful information and data concerning utility services, implementing authorities and beneficiaries have been generated through this assignment.

On the basis of the findings documented in the report, the need for undertaking comprehensive support measures through projects separately for moving the wheel of fortune of the customers irrespective the classification has been assessed.

The customers who are living in these utility areas are not having an equal opportunity. The root of the problem between the rural and the urban settlers lies in unequal economic opportunities. Hence, to achieve optimum customer satisfaction at urban and rural areas, the utility needs to play more vibrant role in initiating and igniting innovative ideas and tools relevant to its context. Therefore, to keep financial commitments for modernising existing facilities and budget for modern logistics needs to be sorted out with care following unbiased principles. Although the generation of electricity is healthy, but still the power outage repeatedly happens due to overloading

of commercial consumers are the worst affected in any adversity of electricity failure. Electricity plays a critical role not only in family life but also in key livelihood activities.

An initiative needs to be taken to orient domestic, industry (small, medium and large) and commercial uses on management of electricity. Awareness campaign and meeting with customers on a regular basis will facilitate identifying the outcome of the provided services, benefits and progress.

The Report of Customer Satisfaction Survey including SAIDI/SAIFI in Power Sector will help in building - trustworthy relationship between rural and urban customers, load management system and staff motivation to bring about more lasting changes within Utilities, which ultimately play a vibrant role in constructing digital to smart Bangladesh.

SECTION 1: INTRODUCTION

1.1 Background

Uninterrupted electricity is the major ingredients for socio-economic development of a country. The Government's vision is to provide quality electricity in a cost-effective and affordable manner as well as ensure reliable electricity for all. In this regard, the Government's targeted to installed capacity of 24,000 MW, which has been already achieved. When the present Government took power in 2009 installed power generation capacity was 4,942 MW which is now 26,550 MW. Currently, Bangladesh has surplus electricity compared to the demand. It may be mentioned that during the last twelve years about 4.48 million new consumers were connected to electricity. As well as access to electricity increased from 47% to 100% Per capita generation is also increased from 220 KWh to 608.76 KWh.

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Bangladesh Government keenly intended to engage a competent consultant through a competitive bidding to carry out the public perception survey on Customer Satisfaction with recommendation of quality power supply including SAIDI/SAIFI to know the ins and outs of the present status of the power sector.

The Power Cell, Power Division under the Ministry of Power, Energy and Mineral Resources, Government of the People's Republic of Bangladesh awarded the assignment to MIDAS after judiciously vetting and considering it submitted Technical and Financial Proposals. Accordingly, an agreement has been signed by Engr. Mohammad Hossain, Director General, Power Cell, Power Division, Ministry of Power, Energy and Mineral Resources, Government of the People's Republic of Bangladesh and Dr. A.S.M. Mashi-ur-Rahman, Managing Director of MIDAS on 29th December 2022.

1.2 Rationale of the Assignment

Customer Satisfaction Survey including SAIDI/SAIFI Analysis is an intrinsic dimension of Customer Satisfaction analysis. It identifies the satisfaction level of different customers specifically how any connected electricity or load affects community people, business enterprises, irrigation pumps and industries individually as well as collectively. It also demonstrates that policy and implementation cannot be customer neutral in electricity connected areas with different categories and so need support of specific analysis tools. Power Cell wants to reach the customers under BPDB, BREB, DPDC, DESCO, NESCO and WZPDCL through Customer Satisfaction Survey. To make sure that the quality services for such a huge number of valuable customers across the areas under BPDB, BREB, DPDC, DESCO, NESCO and WZPDCL, Power Cell opted for customer satisfaction survey by a competent Research Oriented Consulting Firm. So, adhering to the principles of innovativeness, risk reduction and accountability, Power Cell decided to ensure that the mentioned Organization/ Company's schemes being financed are up to the acceptable standard both in terms of results and customer satisfaction including SAIDI/SAIFI analysis.

1.3 Statement of the Assignment

The overall objective of the assignment is to conduct a comprehensive customer satisfaction survey of the 15000 customers under BPDB, BREB, DPDC, DESCO, NESCO and WZPDCL project areas and prepare an inclusive customer satisfaction survey including SAIDI/SAIFI analytical report on the present status and benefits of the implemented services with appropriate feedback for strengthening the initiatives. Power Cell intends to reduce vulnerability and adversity risk by expanding the existing project activities and extending financial support for establishing new electricity lines and connections on the basis of local demand in compliance with uninterrupted supply of electricity for national development initiatives. In order to achieve the desired result, customer satisfaction survey including SAIDI/SAIFI analysis is inclusively needed for ensuring the better load management, reducing the adversity risk and helping flawless electricity to the legitimate customers.

1.4 Purpose of Work

Overall Objectives of the Assignment

MIDAS Team fully understand that the main objective of the assignment is to conduct a survey on customer satisfaction including SAIDI/SAIFI analysis of (6) electricity utilities. As a part of the assignment, MIDAS will develop all the survey tools (Structured Survey Questionnaires, FGD Guidelines, KII Guidelines, SAIDI/SAIFI Format and Case Study Format) based on the supplied Terms of Reference (ToR) and get approval of the Power Cell Authority. The enumeration areas and the Sample distribution per utilities have been developed and finalized with the Power Cell Authorities.

Development Strategy

MIDAS Team is carrying out thoughtfully all the specific tasks following the overall objective of the customer satisfaction survey. The results of the survey would extensively facilitate the Power Cell Authority to know the comprehensive intelligence of the different category consumers under each feeder about the current services they are receiving and their access to electricity in the targeted areas. The survey was critically examined, assessed and identified the level of consumers' satisfaction and analyse strength and weakness of the utility in respect to customer services. The outcome of the survey would also assist Power Cell Authority to equip them to play a vital role in accelerating the development process for strengthening the sustainable performance and management of activities for clearly identified the best practices for replication in other areas. The survey findings would ultimately facilitate to recognize growth potential, skills development needs and help to analyse the current strengths and gaps and enable policy recommendations to address these gaps.

1.5 Scope of Work

Following the scope of work provided in TOR, MIDAS Team has accomplished its entrusted assignment by providing technical inputs in developing different qualitative and quantitative survey tools and collected required data through these from the project areas of the BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL and measured the impact of the providing customer services for the different level of customers. The team has produced a formal Survey Report by compiling the findings and analysing the contributing factors, with proper recommendations for strengthening the current customer services and future advocacy opportunities. Besides the present scope of the customer services, it assumed the task of establishing a credible and neutral customer survey system to monitor the customer services including SAIDI/SAIFI analysis of the mentioned Organizations/ Companies and assess their impacts. Further to establish the system, the customer satisfaction survey framework has carried out for undertaking the collection of data, collating data, analysing data and created reports.

The objective of this assignment is to carry out the survey of customer satisfaction under the selected areas of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL. MIDAS Team carried out the following activities (not limited to) to accomplish the assignment successfully without any hindrance. Details are furnished below:

a) Carry out the survey at different sites of each utility. The name of the sites and sample size were specified and provided by Power Cell following the pre-proposal meeting held on April 24, 2022.

b) Prepare structured questionnaires and use the same questionnaires to collect data from different type of consumers of different utilities. The standard sample size of different category consumers under each feeder will be strictly considered.

c) Evaluate distribution system reliability, verify and evaluate System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI) and Customer Average Interruption Duration Index (CAIDI) under the selected areas.

d) Analyse the primary and secondary data and find out strengths and weaknesses of the utility in respect of customer service as well as objectives.

e) Analyse strengths and weaknesses of the utility in respect of customer service and evaluate distribution system reliability.

f) Prepare specific recommendations for better customer service, policy change, etc. Develop database for continuous follow up of the survey.

SECTION 2: STUDY TEAM

2.1 Prelude

The consultancy services officially commenced on 3rd day after the date of signing of the contract on 29th December 2022 between the Power Cell and MIDAS. Meanwhile MIDAS has initiated the following activities:

2.2 Study Team Mobilization

The MIDAS Team has been formed with the consultants and experts as proposed in the Technical Proposal. MIDAS remains true to its obligations and has authorized Dr. A.S.M. Mashi-ur-Rahman, Managing Director, MIDAS to work as Team Leader for the assignment. The proposed Technical Experts have been placed with their assigned responsibilities.

In addition to the core team required number of Field Supervisors, Field Enumerators, and Data Entry Operators has been selected to carry out their respective assignment in phases.

2.3 Kick-off and Briefing Meeting

A kick-off and briefing meeting were held at 10:30 am on the 5th January 2023 at the Board Room of BPDB, Bidyut (Bhaban 14th Floor), 1 No. Abdul Gani Road, Dhaka-1000. Mr. Mohammad Hossain, Director General, Power Cell, Power Division, Mr. SK. Munir Ahmed, Director (Management), Power Cell, Power Division, Mr. Md. Shazibul Hoque, Director (Operational Performance), Power Cell, Power Division, Ms. Afrin Abdullah, Assistant Director (P&D), Power Cell, Power Division, Mr. Abdullah Al Mohit, Assistant Director (Act, Policy and Contract Management), Power Cell, Power Division, Mr. Saleh Ebn Sharif, Assistant Director (Performance Monitoring), Power Cell, Power Division and Other Senior Officials of concerned Power Cell, DESCO, DPDC, BPDB, WZPDCL, BREB, NESCO and MIDAS Team were present in the Meeting. The list of attendees of Kick-off meeting are shown in the followingTable-1. The concerned officials of Power Cell, Power Division briefed MIDAS Team about the aim and objective of the assignment and assured that required cooperation would be extended without any hindrance. Also, detail discussion on survey tools and sample sizes done in the meeting. As per the suggestions of the meeting survey tools and sample sizes were revised and finalized.

TABLE-1: THE LIST OF ATTENDEES OF KICK-OFF MEETING

S/N	Name	Designation	Organization/ Company
1.	Mr. Mohammad Hossain	Director General	Power Cell
2.	Mr. SK. Munir Ahmed	Director (Management)	Power Cell
3.	Mr. MD. Shazibul Hoque	Director	Power Cell
4.	Mr. Md. Salim Ullah Khan	Deputy Director (Planning & Smart Grid)	Power Cell
5.	Mr. Q.A. Sharhan Sadique	Deputy Director (Sustainable Energy & SDG) and Director (Sustainable Energy), Additional Charge	Power Cell
6.	Mr. S.M. Masuduzzaman	Deputy Director (MIS)	Power Cell
7.	Ms. Afrin Abdullah	Assistant Director (P&D)	Power Cell
8.	Mr. Abdullah Al Mohit	Assistant Director (Act, Policy and Contract Management)	Power Cell
9.	Mr. Saleh Ebn Sharif	Assistant Director (Performance Monitoring)	Power Cell
10.	Mr. Zakiul Islam	Managing Director	NESCO
11.	Engr. Abdus Salam	CE(NO), Addl. Charge	DESCO
12.	Mr. S.M. Imlak Hossain	DGN (ICT)	DPDC
13.	Mr. Md. Mofijul Islam	GM, Commercial Operation	BPDB
14.	Mr. Prince Reza	Executive Engineer	BPDB
15.	Mr. Md. Shahidul Abass	SE (P&D)	WZPDCL
16.	Mr. Md. Rezaul Islam Prodhan	Superintending Engineer	BREB
17.	Dr. A.S.M. Mashi-Ur-Rahman	Managing Director	MIDAS
18.	Mr. Md. Ebrahim Hossain	Assistant General Manager	MIDAS
19.	Engr. Aminur Rahman	Power Sector Specialist	MIDAS
20.	Engr. Md. Tafiz Uddin	Distribution Expert	MIDAS
21.	Dr. Mohammad Rafiqul Islam	Statistician	MIDAS
22.	Ms. Tanha Zafreen	Communication Specialist	MIDAS
23.	Mr. Muhammad Ridwan-Ul-Alam	Manager	MIDAS
24.	Mr. Md. Riashad Joardar	Assistant Manager	MIDAS
25.	Ms. Anamika Islam	PS to Managing Director and Admin Officer	MIDAS

Glimpse of Kick-Off Meeting:

2.4 Group Discussion Meeting with the Experts

A Group Discussion Meeting with the Experts was held at MIDAS Head Office on 4th January 2023. In the meeting, an elaborate discussion was held to determine the modalities of the works to be undertaken e.g., distribution of responsibilities, reporting index and timeline, Guidelines, training & schedule of field enumerators, data collection procedure, data entry procedure and analysis method.

2.5 Organization and Staffing

As an integral part of the consultant's response to provide quality services consistent with the requirements of the TOR, the Survey Team has been selected very carefully and it comprises of professionals of rich experience and high calibre. While each individual team member has plausible academic background, professional expertise and experience, coupled with their proven ability to work as a team, would make the team itself a very effective and coherent group with each member supplementing and complementing the other. The Survey Team included the following key professionals:

Core Team:

Sl.	Name	Position in the Study Team
1.	Dr. A.S.M. Mashi-Ur-Rahman	Team Leader-01
2.	Engr. Aminur Rahman	Power Sector Specialist-01
3.	Engr. Md. Tafiz Uddin	Distribution Expert-01
4.	Prof. Dr. Shaker Ahmed	Financial Expert-01
5.	Dr. Mohammad Rafiqul Islam	Statistician-01
6.	Ms. Tanha Zafreen	Communication Specialist-01
7.	Mr. Md. Ebrahim Hossain	Survey Coordinator-01

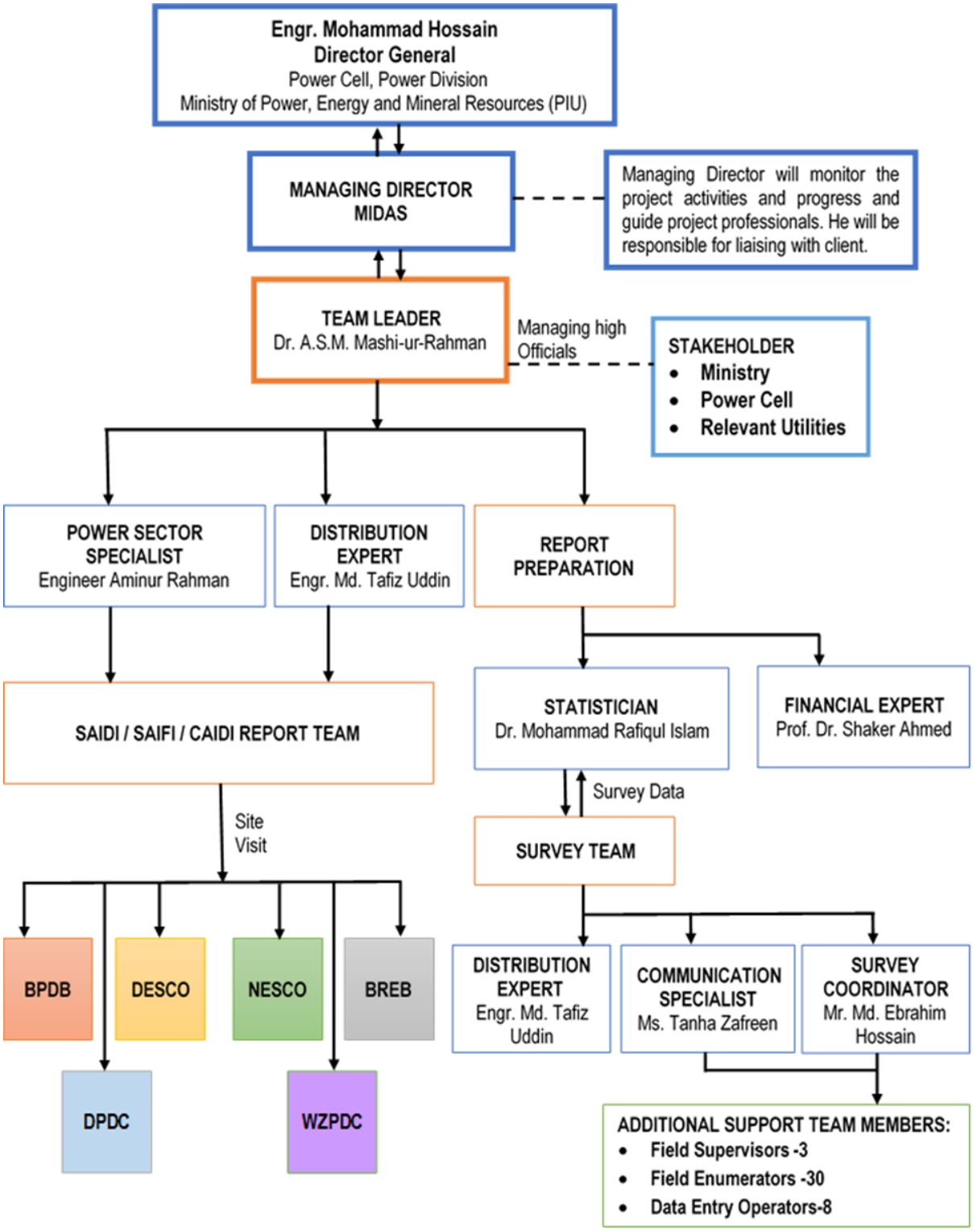
In addition to the core team, field teams have been formed to conduct the survey within the stipulated time. The core team will train the field teams for conducting survey. The core survey team will carry out interviews, meetings and will conduct FGDs at the field. The core team will be responsible for the overall supervision, monitoring and evaluation.

Support Team:

- Field Supervisor-3
- Field Enumerators-51
- Data Entry Operator-20 and
- Data Checker-10

2.6 Project Management Team

The project Team has been performed their duties, responsibilities and reporting according to the following Project Management Organogram that is portrait below:



2.7 Inception Report

An Inception Report has been prepared and presented before the Power Cell along with the Representative of Six (6) Utilities at 2:30 pm on the February 16, 2023 at the Board Room of BPDB, Bidyut Bhaban (14th Floor), 1 No. Abdul Gani Road, Dhaka-1000, Bangladesh. Engr. Mohammad Hossain, Director General, Power Cell, Power Division of Power Cell presided over the meeting. The following officials from Power Cell, DESCO, DPDC, BPDB, WZPDCL, BREB, NESCO and MIDAS Team were attended in the meeting as a participant of the meeting. The detail list of attendees of Inception meeting are shown in the **Table-2** below:

TABLE-2: THE LIST OF ATTENDEES OF INCEPTION MEETING

S/N	Name	Designation	Utilities
1.	Engr. Mohammad Hossain	Director General	Power cell
2.	Ms. Bithi Islam	Director	Power cell
3.	Mr. Q.A. Sharhan Sadique	Director	Power cell
4.	Mr. Md. Salim Ullah Khan	Deputy Director	Power cell
5.	Ms. Afrin Abdullah	Assistant Director (P&D)	Power cell
6.	Mr. Prince Reza	Executive Director	BPDB
7.	Mr. Md. Hossain Imam	Executive Engineer	BPDB
8.	Mr. Md. Giash Uddin	Executive Engineer	BPDB
9.	Mr. Md. Shah Rejwan	Executive Engineer	BPDB
10.	Mr. Md. Shah Alam	Additional Chief Engineer	BREB
11.	Mr. Golam Sarowar	Executive Engineer	DPDC
12.	Mr. Md. Mohibullah	Executive Engineer	DPDC
13.	Mr. Md. Saifur Rahman Bhuiyan	Sub-Divisional Engineer	DESCO
14.	Mr. Md. Golam Mostafa	Executive Engineer	NESCO
15.	Mr. Md. Ruhul Amin	Executive Engineer	WZPDCL
16.	Mr. S.M. Tamim Hossain	Assistant Engineer	WZPDCL
17.	Mr. Md. Ashraful Islam	Assistant Engineer	WZPDCL
18.	Dr. A.S.M. Mashi-Ur-Rahman	Managing Director	MIDAS
19.	Engr. Aminur Rahman	Power Sector Specialist	MIDAS
20.	Engr. Md. Tafiz Uddin	Distribution Expert	MIDAS
21.	Dr. Shaker Ahmed	Financial Expert-01	MIDAS
22.	Dr. Mohammad Rafiqul Islam	Statistician	MIDAS
23.	Ms. Tanha Zafreen	Communication Specialist	MIDAS
24.	Mr. Muhammad Ridwan-Ul-Alam	Manager	MIDAS
25.	Mr. Md. Jafar Alam	Assistant Manager	MIDAS
26.	Ms. Nipa Monalisa	Receptionist	MIDAS

At the end of presentation session, the concerned officials of Power Cell, Power Division provided their opinion on the presentation to carry out the project work without any hindrance. After reviewing the submitted Survey tools, the Power Cell Authority approved the same. The Director General of Power Cell requested all the professional of concern utilities to render their full support to end the survey work as planned. Thereafter, the concern officials of the targeted utilities confirm that they will help the

MIDAS Team in the field spontaneously and provided the SAIDI/SAIFI data and the list of their existing Customer’s database. The Inception Meeting was ended with a vote of thanks to and from the chair.

Glimpse of Inception Report Meeting:

2.8 Interim Report

An Interim Report has been prepared on the basis of work progress and presented the same in-front of the Power Cell along with the Representative of Six (6) Utilities at 2:30 pm on the May 7, 2023 at the Board Room of BPDB, Bidyut Bhaban (14th Floor), 1 No. Abdul Gani Road, Dhaka-1000, Bangladesh. Engr. Mohammad Hossain, Director General, Power Cell, Power Division of Power Cell presided over the meeting. The following officials from Power Cell, DESCO, DPDC, BPDB, WZPDCL, BREB, NESCO and MIDAS Team were attended in the meeting as a participant of the meeting. The list of participants of the aforesaid Interim meeting are portraited in the **Table-3** below:

TABLE-3: THE LIST OF ATTENDEES OF INTERIM MEETING

Sl.	Name	Designation	Utilities
1.	Engr. Mohammad Hossain	Director General	Power cell, Power Division
2.	Md. Shazibul Hoque	Director (Operational Performance)	Power cell, Power Division
3.	SK. Munir Ahmed	Director (Management)	Power cell, Power Division
4.	Md. Salim Ullah Khan	Deputy Director (Planning & Smart Grid)	Power cell, Power Division
5.	Q.A. Sharhan Sadique	Deputy Director (Sustainable Energy & SDG) and Director (Sustainable Energy), Additional Charge	Power cell, Power Division
6.	Afrin Abdullah	Assistant Director (P&D)	Power cell, Power Division
7.	Md. Jahidul Islam	Joint Secretary (Co-ordination)	Power Division
8.	Mr. Md. Mofijul Islam	GM, Commercial Operation	Bangladesh Power Development Board (BPDB)
9.	Engr. AFM Nur Uddin Ahmed	Executive Engineer	S&D, Khulshi, Chittagong, Bangladesh Power Development Board (BPDB)
10.	Engr. Md. Touhidul Islam	Executive Engineer	S&D, Halishahar, Chittagong, Bangladesh Power Development Board (BPDB)
11.	Engr. Chingla Mong Marma	Executive Engineer	S&D, Agrabad, Chittagong, Bangladesh Power Development Board (BPDB)
12.	Engr. Md. Mushfiqul Hasan	Senior General Manager	Head Quarter, Narayanganj Palli Biddut Somitee-1, Bangladesh Rural Electrification Board (BREB)
13.	Engr. Jafor Sadiq Khan	AGM (O&M) & AGM (MS) AC	Head Quarter, Narayanganj Palli Biddut Somitee-1,

Sl.	Name	Designation	Utilities
			Bangladesh Rural Electrification Board (BREB)
14.	Md. Muhibullah	Executive Engineer	Executive Engineer, NOCS, Lalbagh, Dhaka Power Distribution Company Limited (DPDC)
15.	Md. Golam Sarwer	Executive Engineer	NOCS, Tejgaon, Dhaka Power Distribution Company Limited (DPDC)
16.	Mohammed Shahanur Rashid	Sub-Divisional Engineer	NOCS, Tejgaon, Dhaka Power Distribution Company Limited (DPDC)
17.	Engr. Mohammad Sayedur Rahman	Superintending Engineer	S & D Operation (Tongi Circle), Dhaka Electric Supply Company Limited (DESCO)
18.	Engr. Md. Golam Mostofa	Executive Engineer	Sales & Distribution Division-3, NESCO PLC, Rangpur
19.	Engr. Md. Abdul Mozid	Superintending Engineer (Addl. Charge)	System Protection, HQ, West Zone Power Distribution Company Ltd. (WZPDCL)
20.	Engr. Debashis Paul	Superintending Engineer	System Protection, HQ, West Zone Power Distribution Company Ltd. (WZPDCL)
21.	Md. Asraful Islam	Assistant Engineer	Satkhira Electric Supply, WZPDCL, Satkhira
22.	Engr. S.M. Tamim Hossain	Assistant Engineer	Sales & Distribution Division (S&D)-3, Khulna, West Zone Power Distribution Company Ltd. (WZPDCL)
23.	Dr. A.S.M. Mashi-ur-Rahman	Managing Director (MIDAS)	MIDAS
24.	Engr. Aminur Rahman	Power Sector Specialist	MIDAS
25.	Prof. Dr. Md. Rafiqul Islam	Statistician	MIDAS
26.	Tanha Zafreen	Communication Consultant	MIDAS
27.	Md. Ridwan-Ul-Alam	Manager	MIDAS
28.	Anamika Islam	Executive Secretary	MIDAS
29.	Nipa Monalisa	Receptionist	MIDAS

At the end of the presentation, the concerned officials of Power Cell, Power Division provided their opinion on the presentation to implement the project work smoothly. After reviewing the presented survey tools, the Power Cell Authority approved the same. The Director General of Power Cell requested all the professional of concern utilities to render their full support to end the survey work as planned. Thereafter, the concern officials of the targeted utilities confirm that they will extend their helping hand to MIDAS Team in the field spontaneously and provided the SAIDI/SAIFI data as needed. The Interim Meeting was ended with a vote of thanks to and from the chair.

Glimpse of Interim Report Meeting:




2.9 Training of Field Staff

The training has been conducted on all Survey Tools for the 51 field enumerators (38 Males and 13 Females), 3 supervisors (Male) and 5 quality checkers (Male) for collecting data efficiently. Beside this, 20 Data Entry Operators has been trained for entering the collected data into the STATA, Statistical software efficiently. MIDAS also appointed 10 personnel for doing the rechecking of the collected data over Telephone. This training was totally a participatory and hands-on practical training. A Full-time mock-up session has been arranged to enhanced the skill of the Field Team. Training starts on 10 am and ends on 6 pm at MIDAS centre. Two days has been allocated for Class room training and one day for Field Testing.

Some Glimpse of Training Session:

SECTION 3: TECHNICAL APPROACH & METHODOLOGY

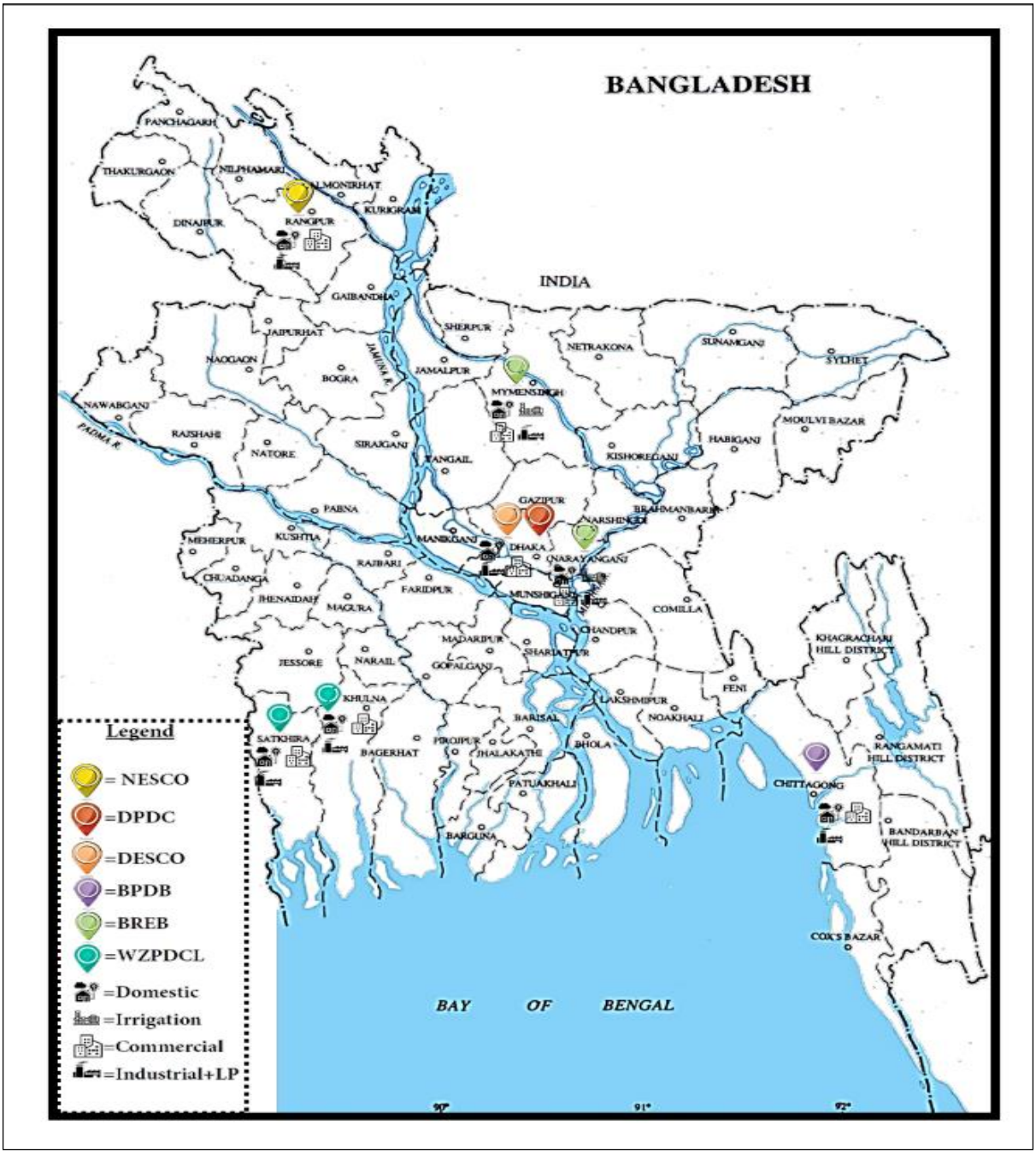
3.1 Prevision

An outline of the technical approach and methodology was provided in the technical proposal. The details of the technical approach and methodology are furnished below:

3.2 Map of the Surveyed Area

MIDAS Survey Team surveyed 15245 customers of BPDB, BREB, DPDC, DESCO, NESCO and WZPDCL. The survey areas' MAP is shown below (Figure-1)

FIGURE-1: UTILITY WISE ENUMERATION AREA MAP



3.3 Methodology of the Assignment

3.3.1 Approaches to Services

a) General Approach

The general approach to consultancy services of the consultant firm is highly based upon the scope of the consultancy services but not limited to what it is expected. Under the broad guideline of the Client for the services the Consultant Firm will accomplish services in various phases and stages. The principal stages and events in the time of implementing a ToR based implementation plan of this assignment. Besides, the field personnel Training, it will also include different Study Tools and Checklist (if needed) for collecting data from the target respondents as stated in the ToR following the Assessment of Customers Satisfaction Survey including SAIDI/SAIFI Analysis through qualitative and quantitative data collection protocol. The relevant professionals of MIDAS Team will perform aforementioned work upon signing the contract.

b) Technical Approach

The Technical Approach to the consultancy and delivery of services are highly related to systematic development of different tools by the MIDAS Team and dependent on both synergetic efforts of the Client-Consultant relationship and on the individual responsibility of the consultant for accomplishing the assigned tasks and purpose of the services in coordinated manner.

In the following paragraphs, other approaches and methodology adopted by the MIDAS Team to carry out all aforementioned project tasks, which have been described details in the ToR. It is anticipated that all works together with development of different tools and implementing of ToR based implementation of planning system has been undertaken simultaneously for collecting data from the targeted respondents for extracting the accurate and useful information about the level of Customer Satisfaction including SAIDI/SAIFI data and their future need through data editing, data entry, data cleaning, analysing, transform the data into reports with observations. MIDAS Team planned and co-ordinated their work and accomplished the tasks effectively on time.

MIDAS considered that all the works has been performed within the Desired Time Frame and as per the guidance of the designated representative. To run this project implementation plan effectively, MIDAS Team has assembled a Team of well-qualified and practically experienced professionals along with appropriate knowledge and expertise for implementing the ToR based Assignment’s Implementation Plan and develops other necessary tools.

Developing Tools and Implementing the assignment

(a) At First Step: As a part of the methodology of services, the consultants particularly, the Team Leader in collaboration with the Client and MIDAS Team. In the first phase upon signing the contract, the relevant professionals have been trained on how to achieve the objective of the assignment and perform the planned activities by using the ToR Based assignment’s components and review documents for running the progress of this assignment and test to fix-up standard performance value at operation level. The consultant has been reviewed all the relevant documents provided by the Client, which they designed for the purpose of the project assignment systematically.

(b) At Second Step: In the second step**,** the Consultants received and developed all the needed tools that required to conduct the ToR based assignment systematically on the basis of action plan. This has included data collection, data entry and transform the results into report as well as periodic updating to accommodate all the relevant activities to achieve the TOR based objective as per schedule. The consultant has taken their responsibility to achieve the implementation plan to secure the whole process. Over and above, the Consultants are fully responsible for refining, developing and maintaining which are appropriated to make changes or updates with prior approval of the Client nominated Authority.

(c) At Third Step: In this phase, the actual Customer Survey has started followed by training of Field Enumerators/Data Collectors. The MIDAS Team conducted survey to collect quantitative and qualitative data from the target group and prepared checklist by drawing appropriate methodology and population within the stipulated timeframe by engaging trained enumerators/data collectors and technical experts under the direct supervision of Team Leader and organize two-day long training program along with one-day field test to orient them on the purpose, methods, techniques and tools of interviews. After the training, the field team started their data collection from selected enumeration areas and sources by holding one-to-one face-to-face interviews. As such the Consultants implemented the field surveys to collect independent data of different target groups. All the work has been done as per the scheduled planning and strata wise, the Field Survey, Data Collection, and Analysis of Results has been derived. Required Tools has been undertaken and procured (if needed) after due approval of the nominated Authority. Selected the respondents for conducting face-to-face survey in consultation with Power Cell Project Authority. Consultants started the survey after accomplishment of training of the data collector and test the survey questionnaires in the field.

Management of Data: For management of data, the collected data after editing and due cleaning has been entered into the data processing tools and prepared the report and database with appropriate data security.

(d) At Fourth Step: In this phase, the Consultants performed all planned activities as designed to implement the project components, conducted the face-to-face interviews of beneficiaries at various places of different working areas of target groups. The consultant has been performed the analysis of participants' feedback including regular monitoring of the trends in participants' opinion, highlighting issues of note, as well as more detailed evaluative analysis, exploring the reasons why opinions have changed and establishing correlation and attribution/contribution to the total process. Supervision and monitoring tools development activities and reviewing the capacity development training and project's planned activities report for ensuring that the project components has been implementing accurately and successfully as expected by Power Cell Project Authority.

c) Approach to Mobilization of Services

Immediately after signing the Contract Agreement, MIDAS Team, mobilized the manpower according to the Manning Schedule for doing the jobs specified for them. After the Reconnaissance Meeting with Power Cell, MIDAS Team paid special attention to fulfil the requirements of the TOR and its improvement. In making such improvement the MIDAS Team incorporated all the observations, comments and suggestions required to implement the Customer Satisfaction Survey including SAIDI/SAIFI data as desired by the Power Cell.

d) Approach to Collected Data Processing Services

As per Scope of Consultant's Services, MIDAS engaged the Consultants to conceptualise the deliverable goods and services to the client by transforming the data into reports with agreed design with the help of technologies and software programs. Above all MIDAS is dedicatedly committed to provide systematic data collection and management services in general and in particular are responsible for:

- Procurement of goods and materials viz-a-viz technologies (Hardware and Software) for the systematic process and operation as needed
- Managing and executing Customer Satisfaction Survey
- Management of various functions - FGDs, KIIs, SAIFI, SAIDI, CAIDI, Case Study, Data Collection and Analysis
- Development of different Guidelines and Formats for carrying out the assignment and management
- Data editing, coding, cleaning and entry
- Data analysis and result interpretation and report writing
- Understanding of local conditions

e) Approach to Quality Control

The engaged consultants worked as a team and they were responsible for performing individual duties as specified in the TOR (Job Responsibility). At all stages, the consultants were accountable to the Team Leader as well as to the client for their duties and responsibilities. They checked and verified the quality of the collected data, data interpretation, and refinement through appropriate analytical tools for transforming the same to report. They kept a close watch on the security and safety of the data and ensure scanning/rechecking of inferior quality data before processing. They also prevented the leakage of data against any threats from others and also against inferior workmanship and saw defects, if any, before putting them for processing for the generation of the report which is being submitted to Power Cell nominated authority.

Besides, Effective supervision and quality control made through monitoring the progress of work in the field. The supervision of the survey work and quality control has been given with the utmost importance. Internally the team leader with the support from the survey manager and consultant ensured the quality of data collection by spot-checking, field editing and random visits. The quality control and survey supervision conducted simultaneously to execution of the survey.

3.3.2 Duration of Assignment & Location

As per the signed contract between Power Cell and MIDAS on 29th December 2022, the time for commencement of the Services was 3rd (Third) day from the date of contract signing, which was 1st January 2023 (effective date of contract). The duration of the assignment is for 8 months from the effective date of contract. As such the assignment will end on 29th August 2023 (29th December 2022 to 29th August 2023). The survey locations are situated in selected areas under BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL in Chattogram, Dhaka, Khulna, Satkhira, Rangpur, Mymensingh and Narayangonj districts.

3.3.3 Responsibilities Performed by MIDAS Team

Under the direct supervision of the Power Cell nominated authority and in coordination with Power Cell team, and in collaboration with Local BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL authorities, MIDAS Team is carrying out strictly the following tasks:

a) Prepare detail methodology of the assignment and data collection tools i.e., structured questionnaire, check list, FGD Guidelines, KII Guidelines, Case Study Format and SAIFI, SAIDI and CAIDI Guidelines for individual stakeholders;

b) Conduct Survey at the different sites of each utility according to sampling plan;

c) Prepare and Submit the Interim Report;

d) Conduct FGDs with different concerned respondents under the selected areas;

e) Conduct KIIs with key stakeholders in the selected survey areas;

f) Collect data for Case Study as per Case Study Format;

g) Collect Interruption Data for SAIFI, SAIDI and CAIDI as per Guideline;

h) Recheck 10% of the total Respondents over phone;

i) Data entry of collected information, analysis and preparation of Draft Final Report and submit to the Power Cell Authority. Present the survey finding by arranging stakeholder meeting and insert the relevant feedback into the Final Report.

j) Present the Final Outcomes to the Higher Authority in a Dissemination Workshop and noted the participants' opinion;

k) Prepare the Final Report by inserting the relevant feedback and submit the Final Report to the Power Cell Authority.

3.3.4 Deliverables

MIDAS Team fully responsible to prepare and deliver the following deliverables sincerely and honestly to Power Cell Authority on time:

1) **Inception Report:** Preparation and Submission period of Inception Report is within one month from signing of the contract.

2) **Interim Report:** Preparation and Submission of Interim Report is within four months from the date of the signing of the contract.

3) **Draft Final Report (DFR):** Preparation and Submission of Draft Final Report is within six months from the date of the signing of the contract. MIDAS Team is responsible for arranging a stakeholder meeting on the Draft Final Report and incorporate the views of the stakeholders in the Draft Final Report.

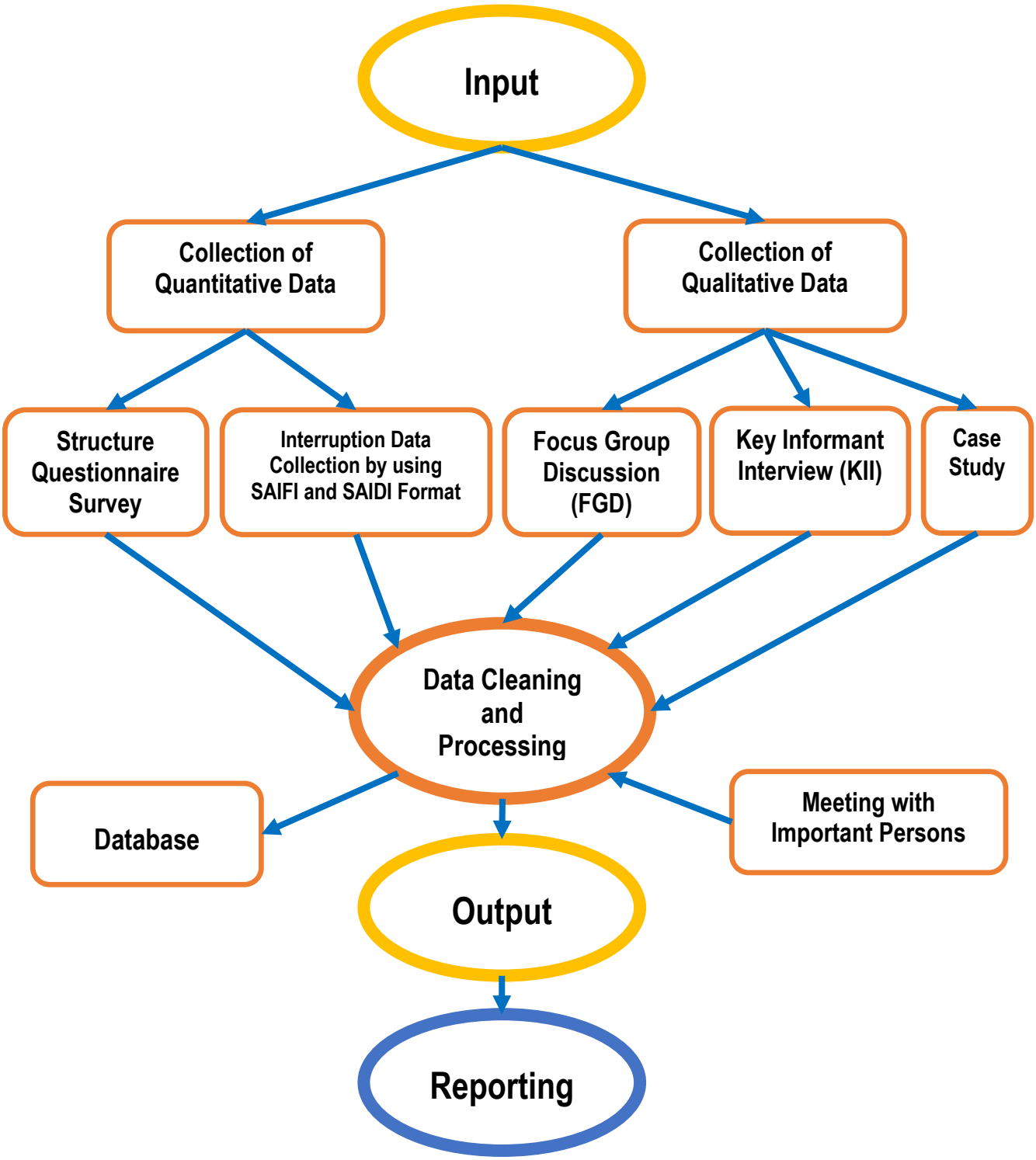
4) **Final Report:** Preparation and Submission of Final Report is within eight months from the date of the signing of the contract. MIDAS Team is fully responsible to present the survey outcome to the higher Authority of Power Sector in a National Dissemination Workshop.

3.4 Methodology

3.4.1 Study Methodology

The Customer Satisfaction Survey involved both quantitative survey and qualitative research using Questionnaire Survey, Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), SAIDI and SAIFI Format, Case Study and preparation of Database for continuous follow up of the survey. The following diagram shows the overall methodology diagram at a glance.

METHODOLOGY DIAGRAM



3.4.1.1 Developing Tools and implementing the entrusted assignment of customer satisfaction survey

The Customer Satisfaction Survey has been conducted by using a structured questionnaire. Apart from the structured questionnaire, guidelines for conducting FGDs, KIIs, Case Study format and data collection tools of SAIFI, SAIDI and CAIDI were used. These tools were elaborately discussed for finalization in the Kick of Meeting held on 5th January 2023. Subsequently finalized versions of customer satisfaction survey questionnaire, guidelines for FGDs, KIIs, Case Study Format and data collection tools of SAIFI, SAIDI and CAIDI approved by the Power Cell authority.

Survey Questionnaire (**Annexure 1)**, FGD Guidelines **(Annexure 2)**, KII Guidelines (**Annexure 3)**, Case Study Format **(Annexure 4)** and SAIFI, SAIDI and CAIDI Guidelines (**Annexure 5)** are placed respectively as ready reference.

MIDAS Team developed all the required tools to conduct the TOR based customer satisfaction survey on the basis of an action plan. This also included data entry and reporting as well as periodic updating of the underlying system design to accommodate new indicators, reports and figures. The technical expert at this stage as per agreement took responsibility to share experiences needed to secure the whole process. Over and above, the technical expert was responsible for refining, developing and maintaining detailed system specifications, and where appropriate made the necessary system changes or updates with prior approval of the Power Cell nominated authority.

3.4.1.2 Survey and Data Collection

3.4.1.2.1 Questionnaire Survey (QS): MIDAS Survey Team carried out the questionnaire survey in the field with the help of Structured Questionnaire approved by Power Cell Authority. MIDAS Team translated the approved tools in Bangla for easy understanding of the Field Enumerators and the targeted respondents. All the work was performed as planned. Field Supervisors supervised and monitored the data collection activities of field enumerators in the field.

The actual customer satisfaction survey operation started followed by a 3-day training course for Field Enumerators to orient them on the purpose, methods, techniques and tools of interviews. After the training, they were sent for data collection from selected offices and sources by holding one-to-one face-to-face interviews and verifications. The customer satisfaction surveys were undertaken after due approval of the Power Cell nominated authority.

As officially specified and distributed by Power Cell, a total of **15,000 electricity customers [Domestic (Prepaid and Post Paid), Industrial + LP, Irrigation, and Commercial]** surveyed in the following Seven Zones from Six Utilities:

- **Dhaka:** Dhaka Electric Supply Company Limited (DESCO), No. of Customers to be Surveyed 4212;
- **Dhaka:** Dhaka Power Distribution Company (DPDC), No. of Customers to be Surveyed 2160;
- **Chattogram:** Bangladesh Power Development Board (BPDB), No. of Customers to be Surveyed 2807;
- **Khulna:** West Zone Power Distribution Company Limited (WZPDCL), No. of Customers to be Surveyed 1201;
- **Mymensingh:** Bangladesh Rural Electrification Board (BREB), No. of Customers to be Surveyed 1105;
- **Narayangonj:** Bangladesh Rural Electrification Board (BREB), No. of Customers to be Surveyed 1105;
- **Rangpur:** Northern Electricity Supply Company Limited (NESCO), No. of Customers to be Surveyed 1310;
- **Satkhira:** West Zone Power Distribution Company Limited (WZPDCL), No. of Customers to be Surveyed 1100;

The following **Table-4** shows the detail field survey plan.

TABLE-4: FIELD SURVEY PLAN

Zone/Utility	Total Consumers (Primary Survey)	Number of KIIs	Number of FGDs	Number of Case Study	Survey Teams	Days required
Dhaka/ DESCO	4212	6	1	1	Team 1: Supervisor: 1 person Field Enumerator: 10 persons Team 2: Supervisor: 1 person Field Enumerator: 10 persons Team 3: Supervisor: 1 person Field Enumerator: 10 persons	70-75 days
Dhaka/ DPDC	2160	4	1	1		
Khulna/ WZPDCL	1201	2	1	1		
Satkhira/ WZPDCL	1100	2	0	0		
Chattogram/ BPDB	2807	6	1	1	Team 1: Supervisor: 1 person Field Enumerator:10 persons Team 2: Supervisor: 1 person Field Enumerator: 10 persons Team 3: Supervisor: 1 person Field Enumerator: 10 persons	50-55 days
Mymensingh/BREB	1105	2	1	1		
Narayangonj/ BREB	1105	2	0	0		
Rangpur/NESCO	1310	4	1	1		
*Re-checked (10%)	1500				Data Re-checker-4	15 days
Total	16500	28	6	6		120-130 days

***Special Note:** As per the decision at the Kick-off Meeting, 10% of the Surveyed Customers has been re-checked through Mobile phone.

3.4.1.2.2 Focus Group Discussion (FGD): Participatory consultations through Focus Group Discussions (FGD) took place with a wide cross-section of people (different respondents/stakeholders which has been selected in consultation with Power Cell) on the issues provided in the TOR. In addition to the questionnaire survey, 6 Focus Group Discussions (FGDs) conducted in the specified Seven Zones to obtain more in-depth understanding of the overall scenario. FGD was a qualitative work in nature and focused at the stakeholders' level to complement and deepen the quantitative survey work.

Focus Group Discussions (FGD) executed by MIDAS Consulting Team. Each FGD arranged consisting of 10-15 participants that has been taken from the Officials of concerned Utility Office of Seven Zones, electricity consumers, relevant government officials, local knowledgeable persons, etc. Qualitative information relating to customer satisfaction were collected by using an FGD Guideline from the participants. FGDs will be arranged in convenient locations so that participants can easily arrive and express their opinion freely.

In addition to FGD, MIDAS Survey Team was conducted one-to-one discussion/interview with concerned stakeholders. This was facilitated to prepare an appropriate remedial paper on the basis of actual scenario and experiences of the concerned beneficiaries.

3.4.1.2.3 Key Informant Interview (KII): The Key Informant Interviews were done with 29 Key Informants drawn from the officials of concerned Utility Office of Seven Zones, electricity consumers, relevant government officials, etc. The preferable persons were selected in consultation with Power Cell.

3.4.1.2.4 Case Study: Seven Customers benefited from electricity were critically selected from the Local Residential, Industrial +LP, Irrigation and Commercial customers randomly. These case studies were an intensive, systematic investigation of a single individual unit in which the researcher examines and prepare a comprehensive report.

3.4.1.2.5 Stakeholder Meeting: A Stakeholder Meeting is a strategic event for getting opinions of stakeholder on the draft final for enriching the report. MIDAS arranged a half-day-long Stakeholder Meeting in consultation with Power Cell Authority. The list of participants was prepared in consultation with Power Cell Authority. MIDAS has 42 years of Professional experience in Transfer of Technology and knowledge (Training). MIDAS conducted/recommended necessary local/foreign/on-job-training after carrying out Training Need Assessment (TNA) of the responsible and relevant personnel of Power Division, Power Cell and other utilities.

3.4.1.2.6 National Dissemination Workshop (NDW): Stakeholders, professionals, consultants, officials, customers, etc who are involved with Power Cell for developing the power sector environment for better customer services and power sector issues in Bangladesh were invited to participate in a half day National Dissemination Workshop. This workshop was arranged in a convenient location in Dhaka where 50-70 selected peoples were invited. The objective of the workshop is to mobilize public opinion for the power sector development focusing on better customer services. The relevant feedback of the National Dissemination Workshop was included in the final report.

3.4.1.2.7 Management of Data: The Team Leader organised group discussions among the Team Members to assess the progress of work and help smooth and timely completion of the assignment. The Team Leader informed the Power Cell authority about the progress of process survey from time to time and obtained their comment/advice. In addition, MIDAS Team held 5 discussion meetings with Power Cell nominated authority in Dhaka for better understanding of the customer satisfaction survey requirements for reporting of the work. For management of Data, the collected data after editing and due cleaning entered into data processing tools for transforming the data into report with appropriate data security.

3.4.1.2.8 Monitoring and Data cleaning: Survey Manager monitored the data collection activities and maintained all time communication with the Supervisors / Data Collectors through mobile phones. Data cleaning begun with the field enumerators who reviewed their survey work at the end of each day. Survey Manager was then look over the work of each enumerator and returned anything to them that do not look reasonable. Supervisors were randomly spot check the validity of the collected information.

In addition to quantitative and qualitative method of data collection as described above, as specified in the given Tor MIDAS carried out SAIFI, SAIDI and CAIDI. The methodology and approach for administering SAIFI, SAIDI and CAIDI were described in detail in the following section:

TABLE-5: DISTRIBUTION OF SAMPLE

Particular		BPDB	BREB	DESCO	DPDC	NESCO	WZPDCL	Total	Achievement
Questionnaire survey	Target	2,807	2210	4212	2160	1310	2301	15,000	102%
	Actual	2,868	2256	4282	2,186	1322	2331	15,245	
FGD	Target	1	1	1	1	1	1	6	100%
	Actual	1	1	1	1	1	1	6	
KII	Target	6	4	6	4	4	4	28	104%
	Actual	7	4	6	4	4	4	29	
Case Study	Target	1	1	1	1	1	1	6	117%
	Actual	2	1	1	1	1	1	7	

Note: Locations for FGD=Focus Group Discussion and KII=Key Informant Interview were selected and finalized after discussion with Power Cell Authority.
Special Note: As per the decision at the Kick-off Meeting, 10% of the Surveyed Customers were re-check through Mobile phone.

3.4.1.3 Sample Size

A total of 15245 customers were surveyed. Apart from questionnaire survey, 6 FGDs, 29 KIIs and 7 Case studies were also conducted in the selected enumeration areas.

The sample in Organizations/ Companies has been selected by the stratified random sampling method with the reliability requirement of 95 %. The sample was chosen so that customers living with different tariff status and on the area of the geographic divisions of the electricity supply Organizations/ Companies had proportional representation in it. In the survey a total 6 utilities and 14 zonal offices were selected. Data were collected by interpersonal interview, between 06-March-2023 to 15-May-2023. Sample allocations are given the following **table-6** below:

TABLE-6: UTILITY WISE TARGET AND ACHIEVEMENT

S/N	Utility	Zone	Zonal Office	Category												Total (Target)	Total (Actual)	Achievement (%)
				Residential			Industrial+LP			Commercial			Irrigation					
				Target	Actual	Extra	Target	Actual	Extra	Target	Actual	Extra	Target	Actual	Extra			
1	BPDB	Chittagong	Agrabad	830	845	15	8	9	1	100	103	3	0	0	0	938	957	102%
			Halisahar	830	835	5	8	8	0	100	101	1	0	0	0	938	944	101%
			Khulshi	823	855	32	8	12	4	100	100	0	0	0	0	931	967	104%
			Sub Total [A]	2,483	2,535	52	24	29	5	300	304	4	0	0	0	2,807	2,868	102%
2	BREB	Mymensingh	PBS01	1,000	1,010	10	10	12	2	80	81	1	15	16	1	1,105	1119	101%
		Narayanganj	PBS01	1,000	1,023	23	15	18	3	80	84	4	10	12	2	1105	1137	103%
			Sub Total [B]	2,000	2,033	33	25	30	5	160	165	5	25	28	3	2,210	2,256	102%
3	DESCO	Dhaka	Pallabi	1,000	1,015	15	2	2	0	50	50	0	0	0	0	1052	1067	101%
			Uttara (West)	1,500	1,515	15	0	13	13	100	109	9	0	0	0	1600	1637	102%
			Tongi (West)	1,500	1,517	17	10	10	0	50	51	1	0	0	0	1560	1578	101%
			Sub Total [C]	4,000	4,047	47	12	25	13	200	210	10	0	0	0	4,212	4,282	102%
4	DPDC	Dhaka	Tejgaon	1,000	1,010	10	10	11	1	50	51	1	0	0	0	1060	1072	101%
			Lalbagh	1,000	1,011	11	10	10	0	90	93	3	0	0	0	1100	1114	101%
			Sub Total [D]	2,000	2,021	21	20	21	1	140	144	4	0	0	0	2,160	2,186	101%
5	NESCO	Rangpur	S&D 2	600	600	0	5	5	0	50	52	2	0	0	0	655	657	100%
			S&D 3	600	609	9	5	6	1	50	50	0	0	0	0	655	665	102%
			Sub Total [E]	1,200	1,209	9	10	11	1	100	102	2	0	0	0	1,310	1,322	101%
6	WZPDCL	Khulna	S&D 3	1,000	1,008	8	10	10	0	191	200	9	0	0	0	1201	1218	101%
		Satkhira	S&D	1,000	1,008	8	10	10	0	90	95	5	0	0	0	1100	1113	101%
			Sub Total [F]	2,000	2,016	16	20	20	0	281	295	14	0	0	0	2,301	2,331	101%
		Total [A+B+C+D+E+F] =		13,683	13,861	178	111	136	25	1,181	1,220	39	25	28	3	15,000	15,245	102%

3.4.1.4 Methods of measuring Satisfaction

The satisfactions are measured separately in the Residential, Industrial+LP, Commercial and Irrigation segments. The customer satisfaction index was a comprehensive measuring tool, which expresses not only the satisfaction with the core offering of the electricity supplier, i.e., the electric power: but also, the satisfaction with the whole performance of the service providers. It meant that the overall satisfaction measured on the satisfaction of the different components of the service package.

The methods of assessing the level of satisfaction of customers of electricity distribution Organizations/ Companies the relative ranking of satisfaction with the electricity supply services is included. The questionnaire measured the consumers' satisfaction by using the scale of 1 to 5 [1=Below Average, 2=Average, 3=Satisfactory, 4=Good, 5=Very Good]. The results of the 5-scale answers converted into point numbers between 1 and 5. The points of the individual indices add up according to the algorithm of the method to a final figure which expresses the overall satisfaction of the customers concerning the services offered by the electricity distribution Organization/ Company. The structure of the satisfaction index is illustrated in **Table-7**. The same structure is used for the importance index.

TABLE 7: THE COMPOSITION OF THE SATISFACTION INDEX

S/N	Index
1	Satisfaction with the available service package (connection)
2	Satisfaction with the services
3	Satisfaction with the communication system
4	Satisfaction with billing system

3.5 Survey Limitations

While conducting an elaborative customer satisfaction survey at customer level in the selected project areas, focussing on the effectiveness of the current customers services of BPDB, BREB, DPDC, DESCO, NESCO and WZPDCL under the direct funding, supervision and co-ordination of the power cell nominated authority, was an extremely difficult job, as this type of comprehensive customer satisfaction survey was conducted critically for the selected electricity distribution Organizations/ Companies of BPDB, BREB, DPDC, DESCO, NESCO and WZPDCL at the customer level, and unprecedented political unrest and prevention during the period.

Many of the survey locations were very far away and difficult to reach because of the fragile communication system and perilous political situations, which created great problems for the Supervisors, Enumerators and Technical Experts to obtain the required information for the customer satisfaction survey at proper time. Therefore, conducting the customer satisfaction survey, focus group discussions, key informant interviews and case studies were quite time consuming and very hazardous at times.

On many occasions, the enumerators were denied access to the assigned areas due to the reluctance of the law-and-order authorities and so conducting the customer satisfaction survey in some remote areas were quite difficult. But with strong zeal and commitment, the enumerators were motivated by the concerned officials to accomplish the assigned tasks under the guidance of the Field Manager and Team Leader.

The Enterprise and Industrial owners were often busy with their daily routine work elsewhere. As a result, the enumerators faced difficulty in finding them and talking to them after reaching the required destinations.

Besides, a major hindrance was caused by political programs during the survey period and forced the Survey Team to change the set schedules, dates and customer satisfaction survey plan.

In some cases, the distances from one customer to another were quite long. As such the enumerators often failed to reach their destinations in time which caused delay in filling up questionnaires.

Most of the time, the respondents were reluctant and fear-stricken to give answer to questions asked directly. This led some enumerators to spend extra time in the field to collect desired information.

SECTION 4: SURVEY FINDINGS

4.1 The Results of the Survey of Customer Satisfaction

4.1.1 Prelude:

The specific objective of this survey was to find out the satisfaction level of the customers including SAIDI/SAIFI analysis with regard to the existing services of selected electricity distribution Organizations/ Companies[1]. This chapter provides the different compositions of satisfaction of the customers received from different electricity distribution Organization/ Company.

4.1.2 Characteristics of Sampled Customers

Table-8 and Figure-2 show the number of customers (Residential, Industrial+LP, Commercial and Irrigation) interviewed during survey. A total of 2,868 customers (18.81%) were selected from BPDB, 2256 customers (14.80%) from BREB, 4282 customers (28.09%) from DESCO, 2,186 customers (14.34%) from DPDC, 1322 customers (8.67%) from NESCO and from WZPDCL 2331 customers (15.29%) were selected for interview. The details are provided below:

TABLE 8 (a): UTILITY WISE TARGET VS ACHIEVEMENT (%)

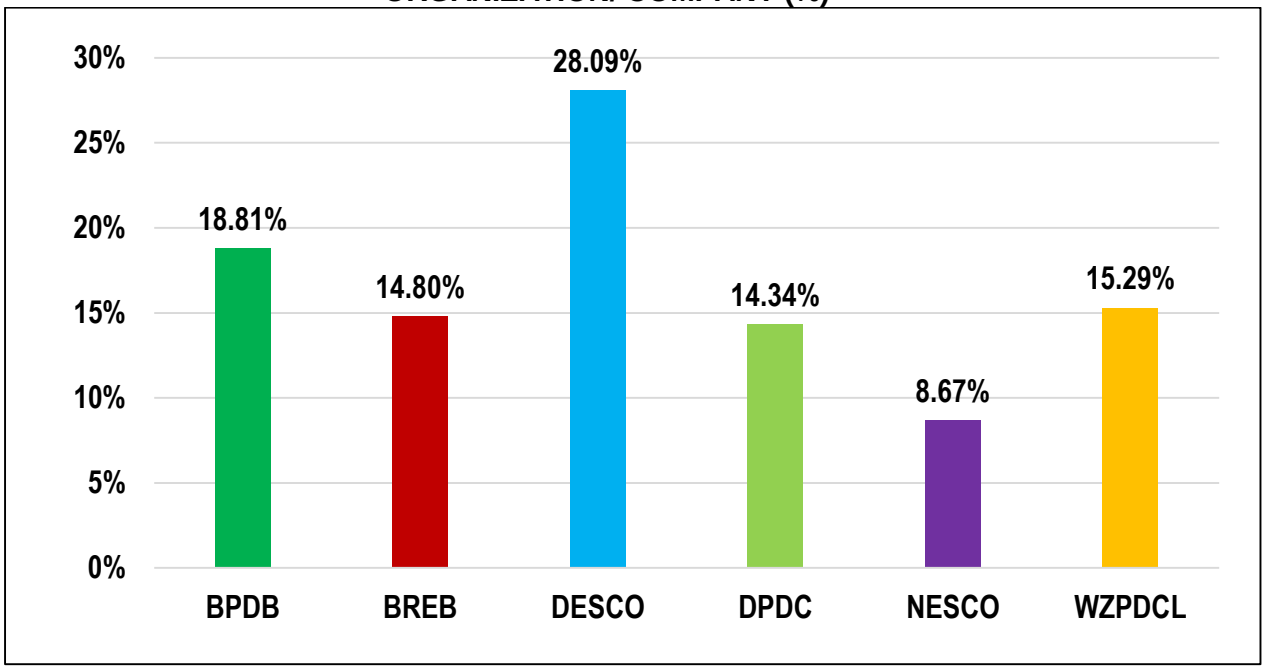
S/N	Utilities	Target	Actual	Achievement
1.	BPDB	2807	2868	102%
2.	BREB	2210	2256	102%
3.	DESCO	4212	4282	102%
4.	DPDC	2160	2186	101%
5	NESCO	1310	1322	101%
6	WZPDCL	2301	2331	101%
	Total	15000	15245	102%

TABLE-8 (b): DISTRIBUTION OF SAMPLED CUSTOMERS BY POWER DISTRIBUTION ORGANIZATION/ COMPANY

S/N	Utilities	Actual	Percentage
1.	BPDB	2868	18.81%
2.	BREB	2256	14.80%
3.	DESCO	4282	28.09%
4.	DPDC	2186	14.34%
5.	NESCO	1322	8.67%
6.	WZPDCL	2331	15.29%
	Total	15245	100.00%

[1] BPDB, BREB, DPDC, DESCO, NESCO and WZPDCL

FIGURE-2: DISTRIBUTION OF SAMPLED CUSTOMERS BY POWER DISTRIBUTION ORGANIZATION/ COMPANY (%)



4.1.3 General information

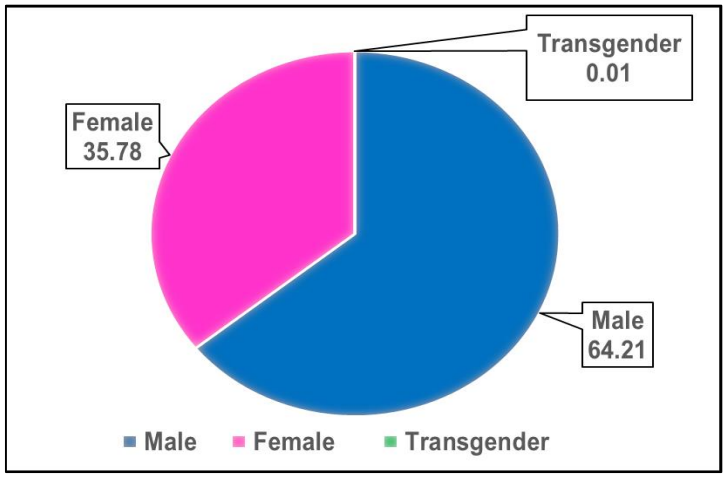
4.1.3.1 Gender of the Customers Interviewed

In this survey among the total respondents, 64.21% were male, 35.78% were female and 0.01% were **transgender[2]. The details are shown at Table-9 and Figure-3** below:

TABLE-9: GENDER OF THE CUSTOMERS INTERVIEWED

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Male	2091	13.72	1318	8.65	2835	18.60	1472	9.66	757	4.97	1316	8.63	9789	64.21
Female	777	5.10	937	6.15	1447	9.49	714	4.68	565	3.71	1015	6.66	5455	35.78
Transgender	0	0	1	0.01	0	0	0	0	0	0	0	0	1	0.01
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-3: GENDER OF THE CUSTOMERS INTERVIEWED (%)



[2] Residencial Customer of BREP, PBS-1, in Sonargaon, Narayangonj, Bangladesh

4.1.3.2 Type of Utility Billing Meter

The Six utilities are using two types of electricity billing meters- pre-paid (7929, 52.01%) and Post-paid (7316l, 47.99%). It is clearly observed that the user of the pre-paid meter is higher (4.02%) than the user of the post-paid meter amongst the six utilities. The stated billing meters are distributed among the utilities as follows-BPDB (Pre-paid 11.46% and Post-paid 7.35%), BREB (Pre-paid 2.85% and Post-paid 11.95%), DESCO (Pre-paid 16.22% and Post-paid 11.87%), DPDC (Pre-paid 11.80% and Post-paid 2.54%), NESCO (Pre-paid 0% and Post-paid 8.67%) and WZPDCL (Pre-paid 9.69% and Post-paid 5.60%). The details are depicted at **Table-10, Figure-4 and Figure-5:**

TABLE-10: TYPE OF UTILITY BILLING METER

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Pre-paid	1747	11.46	434	2.85	2472	16.22	1799	11.80	0	0	1477	9.69	7929	52.01
Post-paid	1121	7.35	1822	11.95	1810	11.87	387	2.54	1322	8.67	854	5.60	7316	47.99
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-4: TYPE OF BILLING METER (%)

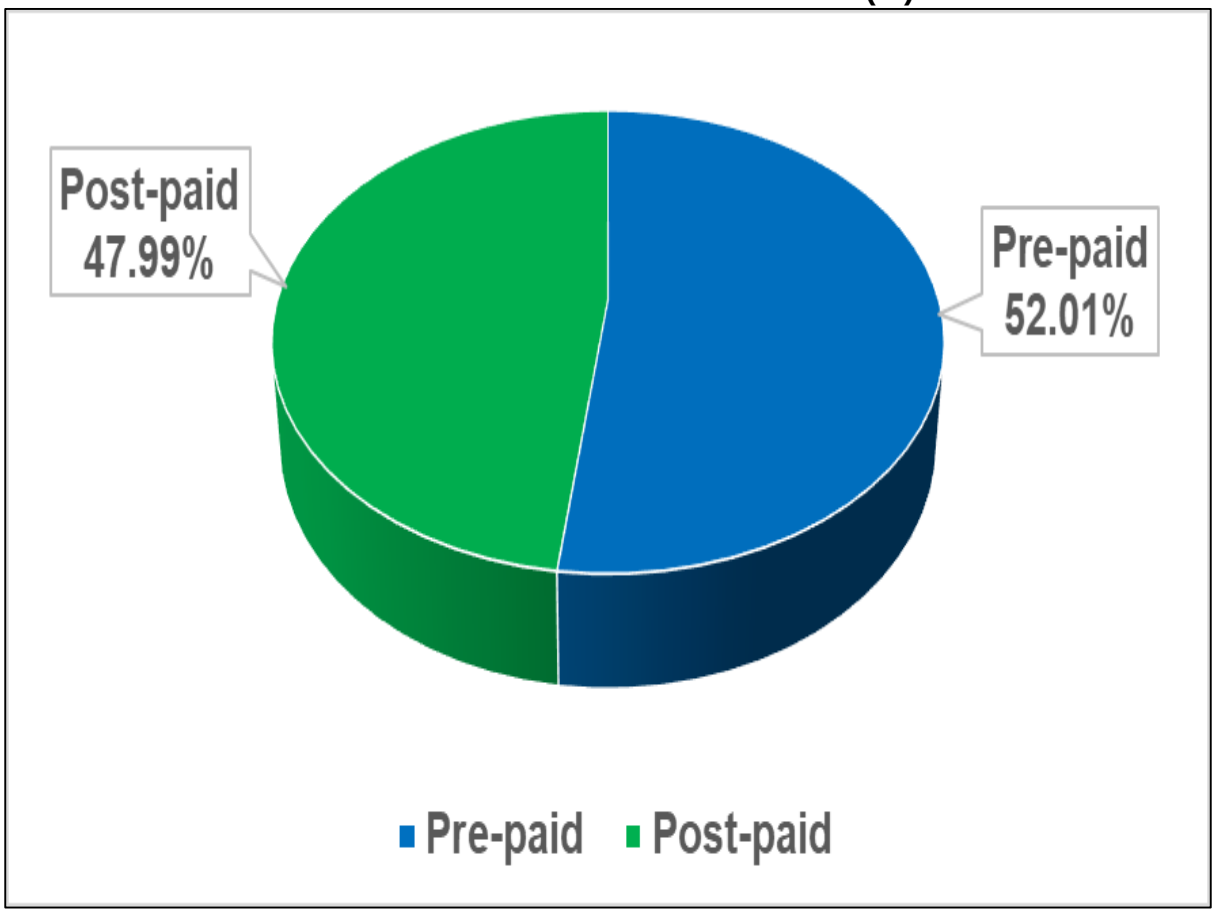
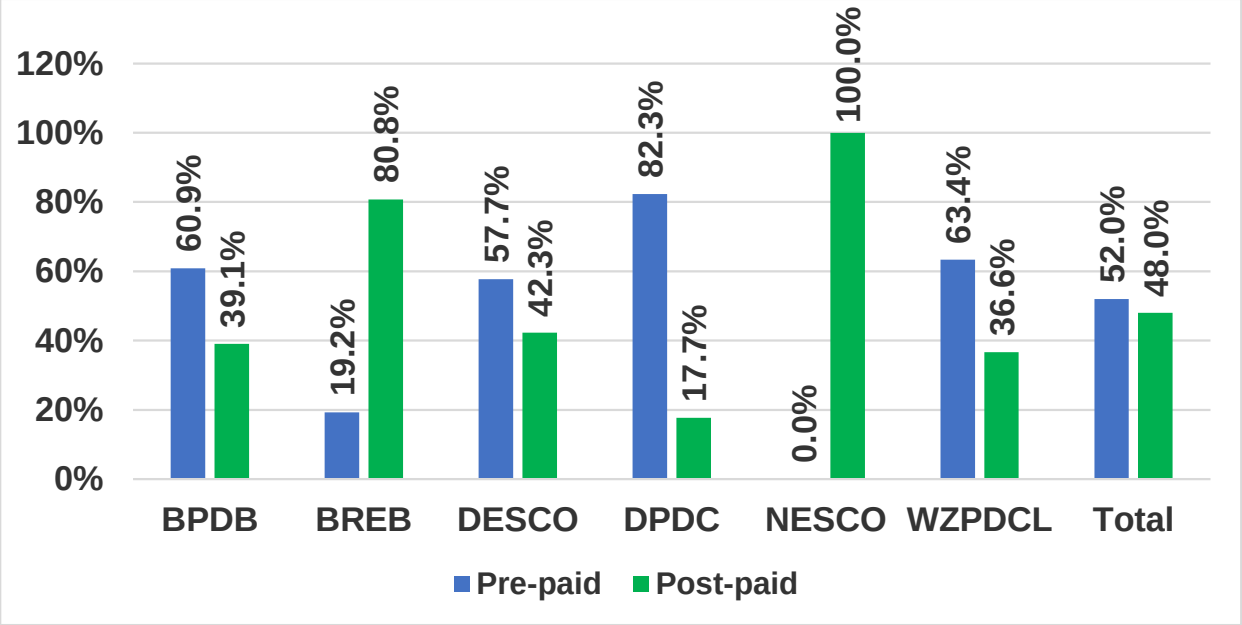


FIGURE-5: TYPE OF UTILITY BILLING METER (%)



4.1.3.3 Status of Customers Interviewed

Customers were interviewed as follows - Residential category 13861 (90.92%), Industrial category 136 (0.89%), Commercial category 1220 (8%) and Irrigation category 28 (0.18%). All the customers have given their views spontaneously aiming to receive better service ahead. The details are described at **Table-11, Figure-6 and Figure-7**:

TABLE-11: UTILITY WISE CUSTOMER STATUS

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Residential	2535	16.63	2033	13.34	4047	26.55	2021	13.26	1209	7.93	2016	13.22	13861	90.92
Industrial	29	0.19	30	0.20	25	0.16	21	0.14	11	0.07	20	0.13	136	0.89
Commercial	304	1.99	165	1.08	210	1.38	144	0.94	102	0.67	295	1.94	1220	8.00
Irrigation	0	0	28	0.18	0	0	0	0	0	0	0	0	28	0.18
Total	2868	18.81	2256	14.80	4282	28.09	2186	14.34	1322	8.67	2331	15.29	15245	100

FIGURE-6: UTILITY WISE DISTRIBUTION (%)

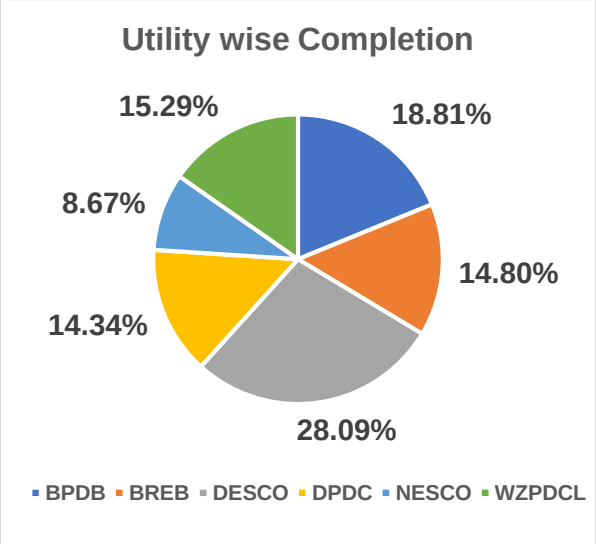
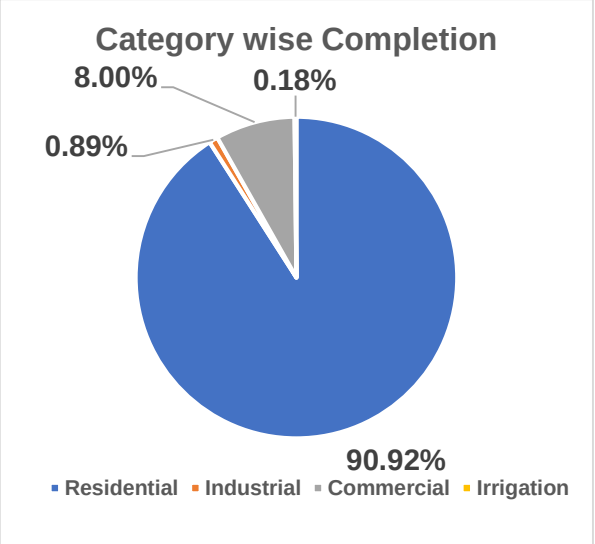


FIGURE-7: CATEGORY WISE DISTRIBUTION (%)



4.1.4 Power Connection

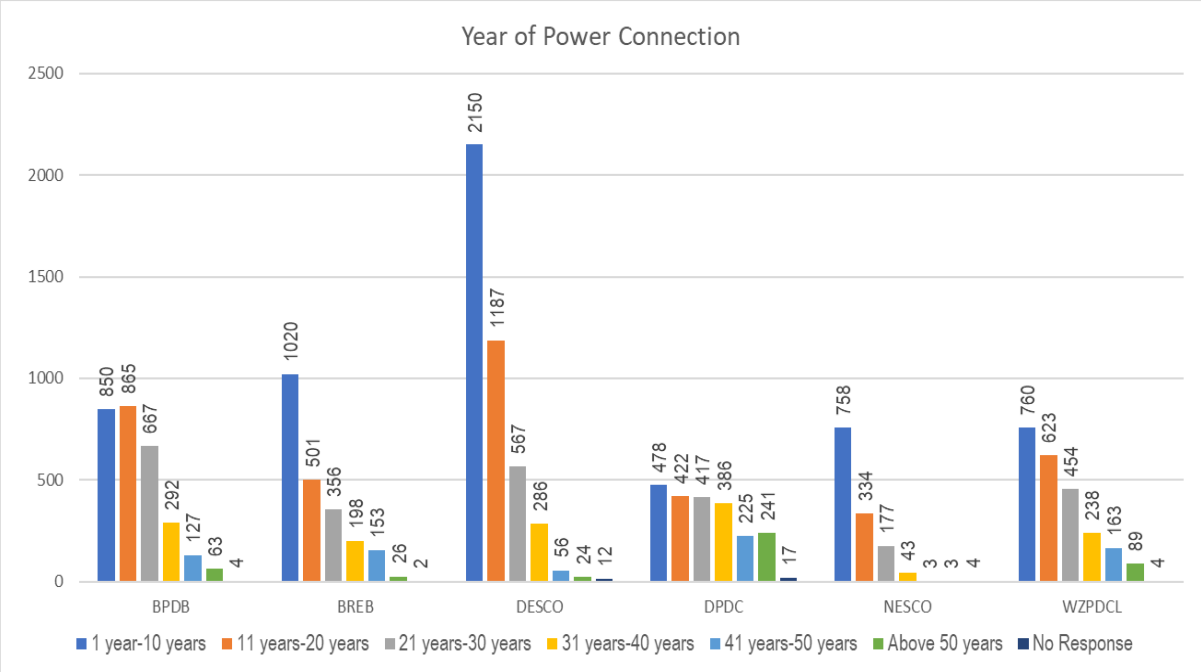
4.1.4.1 Year of Power Connection

It is revealed that most of the surveyed customers were received their power connection within 1-10 years (39.46%), while 25.79% customers were received the connection within 11-20 years, followed by 17.30% customers (21-30 years), 9.47% customers (31-40 years), 4.77% customers (41-50 years), 2.93% customers (Above 50 years) and 0.28% customers (No Response). **The details are furnished below (Table-12 and Figure-8):**

TABLE-12: YEAR OF POWER CONNECTION

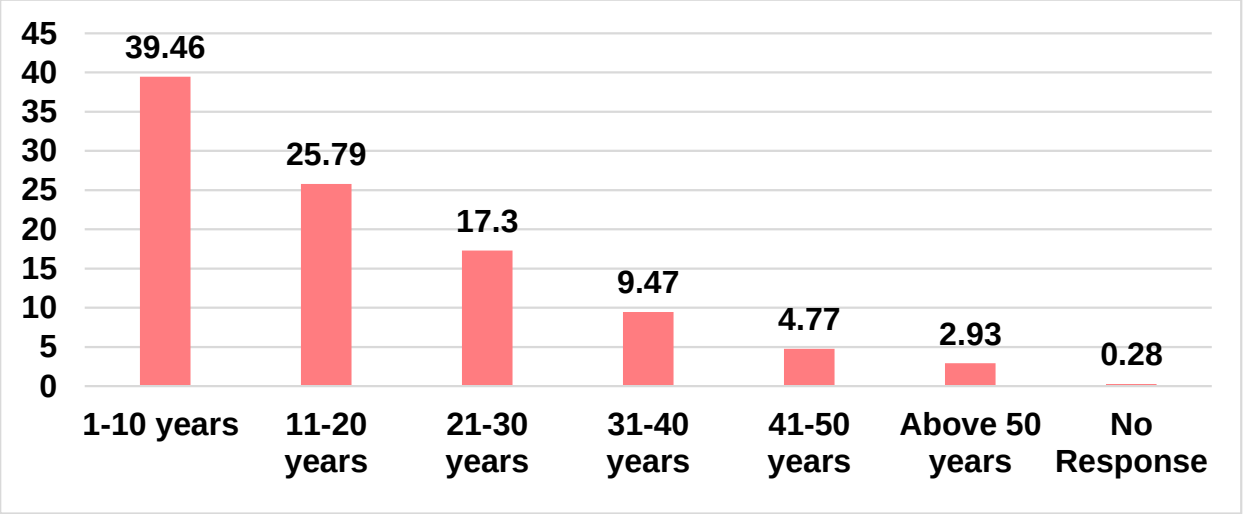
Category	BPDB[3]		BREB[4]		DESCO[5]		DPDC[6]		NESCO[7]		WZPDCL[8]		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
1 year-10 years	850	5.58	1020	6.69	2150	14.10	478	3.14	758	4.97	760	4.99	6016	39.46
11 years-20 years	865	5.67	501	3.29	1187	7.79	422	2.77	334	2.19	623	4.09	3932	25.79
21 years-30 years	667	4.38	356	2.34	567	3.72	417	2.74	177	1.16	454	2.98	2638	17.30
31 years-40 years	292	1.92	198	1.30	286	1.88	386	2.53	43	0.28	238	1.56	1443	9.47
41 years-50 years	127	0.83	153	1.00	56	0.37	225	1.48	3	0.02	163	1.07	727	4.77
Above 50 years	63	0.41	26	0.17	24	0.16	241	1.58	3	0.02	89	0.58	446	2.93
No Response	4	0.03	2	0.01	12	0.08	17	0.11	4	0.03	4	0.03	43	0.28
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-8 (a): YEAR OF POWER CONNECTION (ORGANIZATION/COMPANY WISE)



[3] BPDB was established on May 1, 1972.
[4] BREB was established in 1977.
[5] DESCO was established on November 3, 1996.
[6] DPDC started commercial operation on 1 July 2008 taking over from DESA.
[7] NESCO was established on October 2016 by breaking up different distribution network of Bangladesh Power Development Board
[8] WZPDCL started commercial operation on 04 November 2002.

FIGURE-8 (b): YEAR OF POWER CONNECTION (OVERALL) (%)



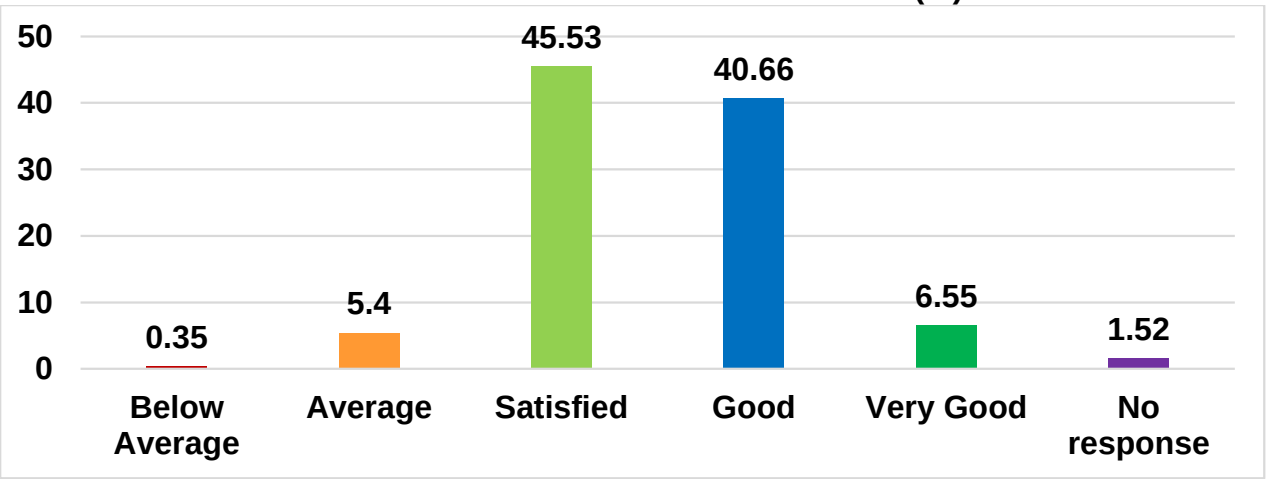
4.1.4.2 Status of Assistance received from power distribution Organization/ Company

Table-13 and Figure-9 denotes that 6.55% customers stated the received assistance as 'Very Good', while 40.66% customers stated the received assistance as 'Good' followed by 45.53% (Satisfied), 5.40% (Average), 0.35% (Below Average) and 1.52% (No response). This means that 92.74% of the customers are satisfied at different levels.

TABLE-13: STATUS OF ASSISTANCE RECEIVED FROM POWER DISTRIBUTION ORGANIZATION/ COMPANY

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Below Average	9	0.06	2	0.01	28	0.18	6	0.04	2	0.01	7	0.05	54	0.35
Average	147	0.96	169	1.11	219	1.44	40	0.26	12	0.08	236	1.55	823	5.40
Satisfied	1029	6.75	1266	8.30	1742	11.43	1452	9.52	237	1.55	1215	7.97	6941	45.53
Good	1370	8.99	747	4.90	2004	13.15	502	3.29	782	5.13	793	5.20	6198	40.66
Very Good	273	1.79	34	0.22	259	1.70	137	0.90	288	1.89	7	0.05	998	6.55
No response	40	0.26	38	0.25	30	0.20	49	0.32	1	0.01	73	0.48	231	1.52
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-9: STATUS OF ASSISTANCE RECEIVED FROM POWER DISTRIBUTION ORGANIZATION/ COMPANY (%)



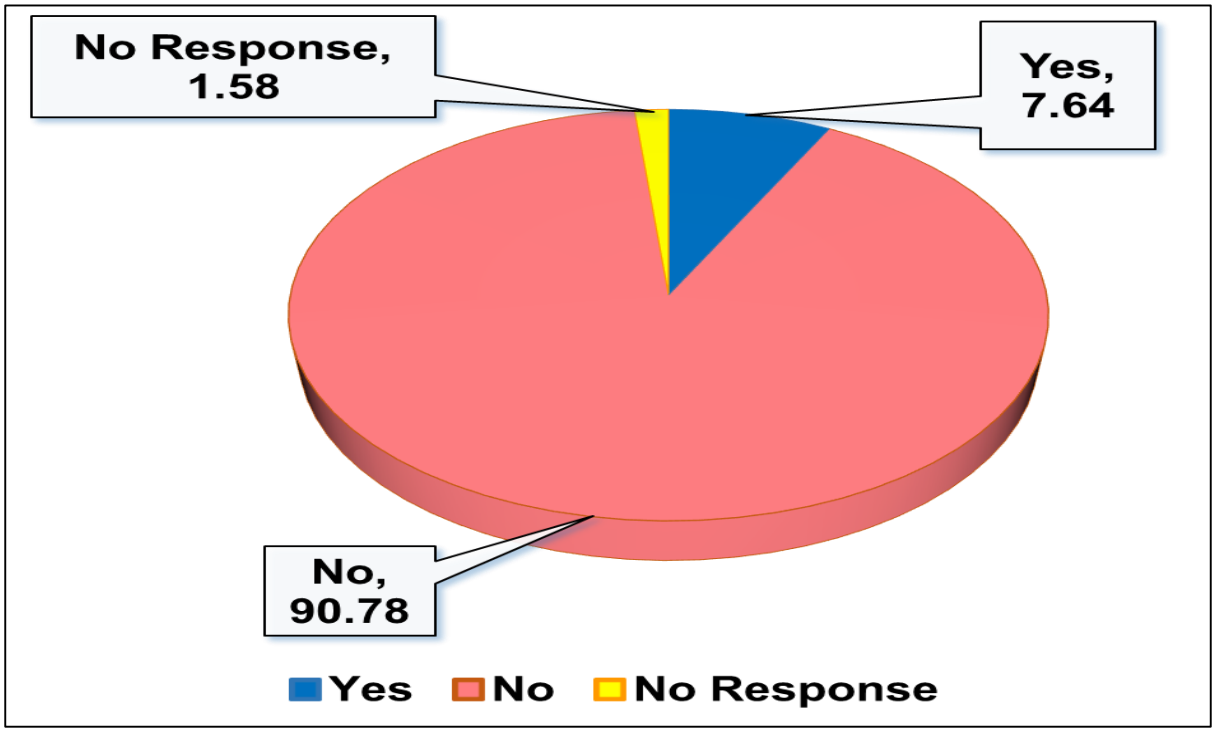
4.1.4.3 Additional Payment besides the fixed Government fees for getting new power connection

Regarding additional payment besides the fixed government fees for getting new power connection 90.78% customers said 'No', they did not pay any type of additional money for getting new power connection, while 7.64% customers said 'Yes' and 1.58% customers said 'Not response' to the question. **Details are furnished below (Table-14 and Figure-10):**

TABLE-14: ADDITIONAL PAYMENT BESIDES THE FIXED GOVERNMENT FEES FOR GETTING NEW POWER CONNECTION

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	95	0.62	184	1.21	350	2.30	184	1.21	45	0.30	306	2.01	1164	7.64
No	2734	17.93	2033	13.34	3902	25.60	1947	12.77	1276	8.37	1948	12.78	13840	90.78
No Response	39	0.26	39	0.26	30	0.20	55	0.36	1	0.01	77	0.51	241	1.58
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-10: ADDITIONAL PAYMENT BESIDES THE FIXED GOVERNMENT FEES FOR GETTING NEW POWER CONNECTION (%)



4.1.5 Electricity Services

4.1.5.1 Status of received Electricity Services

Table-15 and Figure-11 denotes that 12.13% customers stated the received electricity services as 'Very Good'. While 42.35% customers stated the received electricity services as 'Good', followed by 39.33% (Satisfied), 5.63% (Average), 0.39% (Below Average) and 0.08% (No response). This means that 93.81% of the customers are satisfied at different levels.

TABLE-15: STATUS OF RECEIVED ELECTRICITY SERVICES

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Below Average	21	0.14	11	0.07	17	0.11	10	0.07	0	0	0	0	59	0.39
Average	323	2.12	401	2.63	62	0.41	25	0.16	4	0.03	43	0.28	858	5.63
Satisfied	1169	7.67	1244	8.16	1365	8.95	1049	6.88	163	1.07	1006	6.60	5996	39.33
Good	1158	7.60	552	3.62	2183	14.32	905	5.94	575	3.77	1083	7.10	6456	42.35
Very Good	196	1.29	46	0.30	648	4.25	184	1.21	578	3.79	197	1.29	1849	12.13
No Response	1	0.01	2	0.01	7	0.05	13	0.09	2	0.01	2	0.01	27	0.08
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-11: STATUS OF RECEIVED ELECTRICITY SERVICES (%)

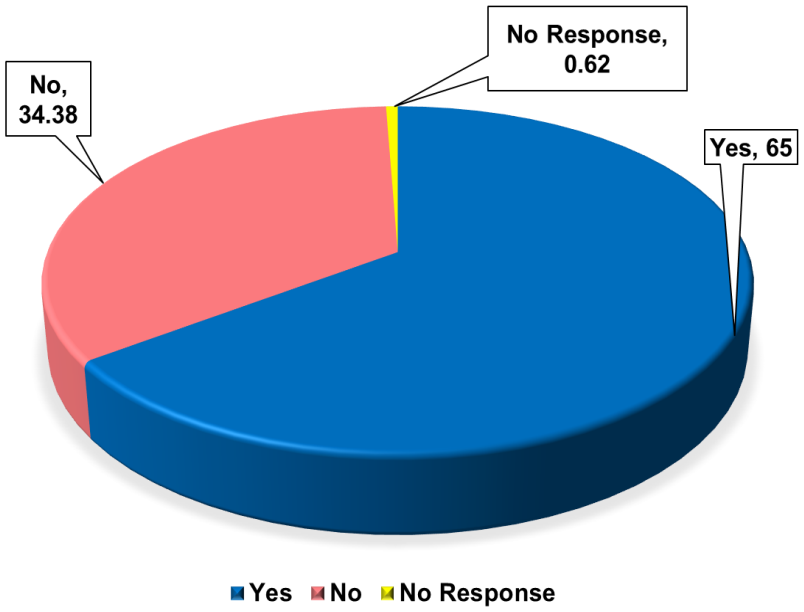
4.1.5.2 Status regarding uninterrupted power supply

Regarding the status of uninterrupted power supply 65.00% customers said 'Yes', while 34.38% customers said 'No' and 0.62% customers said 'Not response' to the question. Details are furnished below **(Table-16 and Figure-12):**

TABLE-16: STATUS REGARDING UNINTERRUPTED POWER SUPPLY

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	1404	9.21	1029	6.75	2685	17.61	1946	12.76	1255	8.23	1591	10.44	9910	65.00
No	1463	9.60	1226	8.04	1556	10.21	201	1.32	65	0.43	730	4.79	5241	34.38
No Response	1	0.01	1	0.01	41	0.27	39	0.26	2	0.01	10	0.07	94	0.62
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-12: STATUS REGARDING UNINTERRUPTED POWER SUPPLY (%)



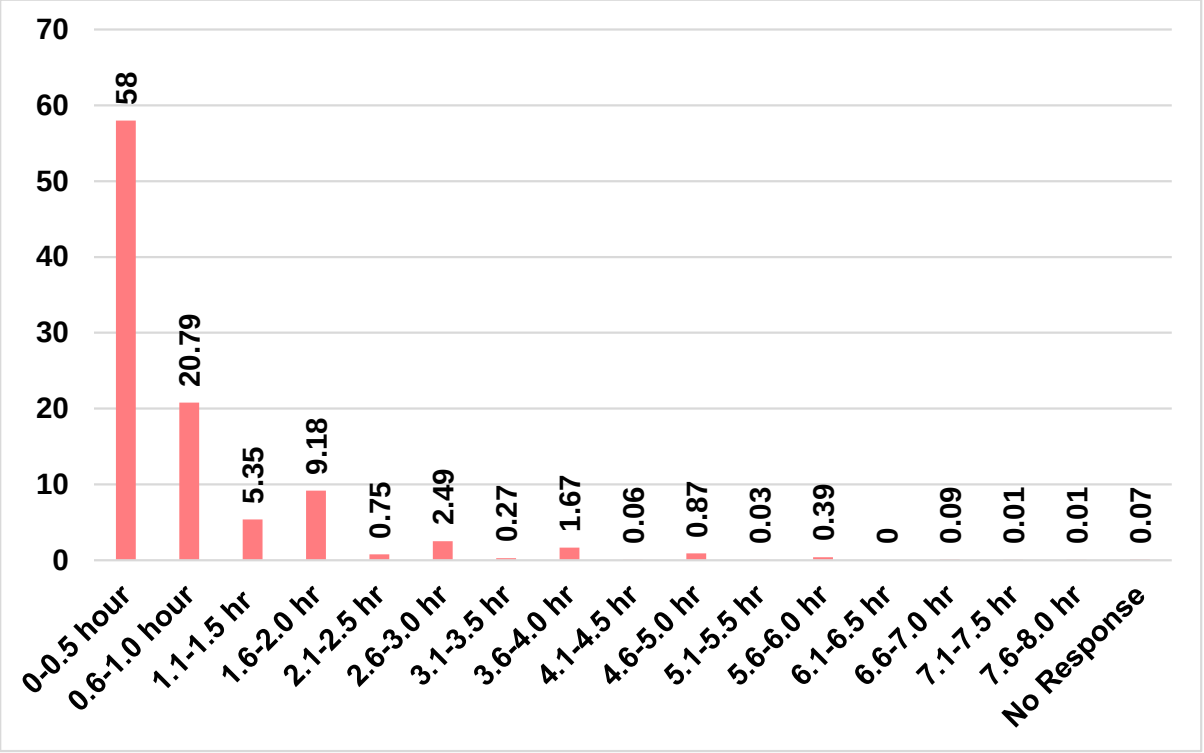
4.1.5.3 Duration of Power Outage per day

The 58% customers stated that Duration of Power Outage per day within '0-0.5 hour', while 20.79% customers stated that Duration of Power Outage per day within '0.6-1.0 hour', followed by 5.35% mentioned (1.1-1.5 hours), 9.18% mentioned (1.6-2.0 hours), 0.75% mentioned (2.1-2.5 hours), 2.49% mentioned (2.6-3.0 hours), 0.27% mentioned (3.1-3.5 hours), 1.67% mentioned (3.6-4.0 hours), 0.06% mentioned (4.1-4.5 hours), 0.87% mentioned (4.6-5.0 hours), 0.03% mentioned (5.1 hours-5.5 hours) and 0.39% mentioned (5.6-6.0 hours). The details are furnished below **(Table-17 and Figure-13):**

TABLE-17: DURATION OF POWER OUTAGE PER DAY

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
0 hour-0.5 hour	391	2.56	299	1.96	3343	21.93	1789	11.73	974	6.39	2046	13.42	8842	58.00
0.6 hour-1.0 hour	1033	6.78	525	3.44	743	4.87	321	2.11	275	1.80	272	1.78	3169	20.79
1.1 hours-1.5 hours	422	2.77	224	1.47	79	0.52	28	0.18	54	0.35	8	0.05	815	5.35
1.6 hours-2.0 hours	767	5.03	494	3.24	83	0.54	35	0.23	15	0.10	5	0.03	1399	9.18
2.1 hours-2.5 hours	27	0.18	81	0.53	6	0.04	1	0.01	0	0	0	0	115	0.75
2.6 hours-3.0 hours	114	0.75	239	1.57	17	0.11	5	0.03	4	0.03	0	0	379	2.49
3.1 hours-3.5 hours	4	0.03	36	0.24	1	0.01	0	0	0	0	0	0	41	0.27
3.6 hours-4.0 hours	53	0.35	195	1.28	4	0.03	2	0.01	0	0	0	0	254	1.67
4.1 hours-4.5 hours	0	0	8	0.05	1	0.01	0	0	0	0	0	0	9	0.06
4.6 hours-5.0 hours	29	0.19	101	0.66	2	0.01	0	0	0	0	0	0	132	0.87
5.1 hours-5.5 hours	0	0	3	0.02	1	0.01	0	0	0	0	0	0	4	0.03
5.6 hours-6.0 hours	18	0.12	41	0.27	1	0.01	0	0	0	0	0	0	60	0.39
6.1 hours-6.5 hours	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.6 hours-7.0 hours	4	0.03	10	0.07	0	0	0	0	0	0	0	0	14	0.09
7.1 hours-7.5 hours	1	0.01	0	0	0	0	0	0	0	0	0	0	1	0.01
7.6 hours-8.0 hours	1	0.01	0	0	0	0	0	0	0	0	0	0	1	0.01
No Response	4	0.03	0	0	1	0.01	5	0.03	0	0	0	0	10	0.07
Total	2868	18.81	2256	14.80	4282	28.09	2186	14.34	1322	8.67	2331	15.29	15245	100

FIGURE-13: DURATION OF POWER OUTAGE PER DAY (%)



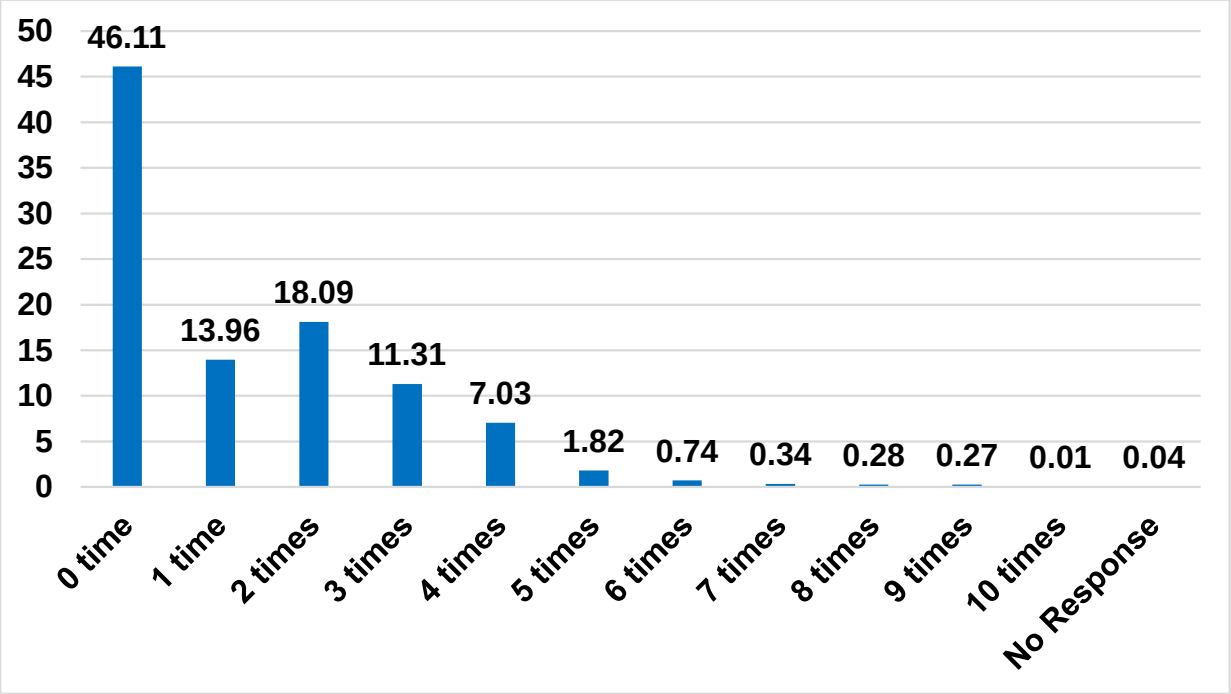
4.1.5.4 Number of power outage per day

The maximum number of the responding customers (46.11%) stated that the number of power outage per day is '0 time', while 13.96% customers stated that number of power outage per day '1 time', followed by 18.09% mentioned '2 times', 11.31% mentioned '3 times', 7.03% mentioned '4 times', 1.82% mentioned '5 times', 0.74% mentioned '6 times', 0.34% mentioned '7 times', 0.28% mentioned '8 times', 0.27% mentioned '9 times', 0.01% mentioned '10 times' and only 0.04% (No Response). The details are portraited below **(Table-18 and Figure-14):**

TABLE-18: NUMBER OF POWER OUTAGE PER DAY

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
0 time	152	1.00	286	1.88	2349	15.41	1560	10.23	998	6.55	1684	11.05	7029	46.11
1 time	298	1.95	248	1.63	1000	6.56	264	1.73	190	1.25	128	0.84	2128	13.96
2 times	949	6.22	499	3.27	669	4.39	287	1.88	83	0.54	271	1.78	2758	18.09
3 times	787	5.16	495	3.25	212	1.39	57	0.37	34	0.22	139	0.91	1724	11.31
4 times	559	3.67	396	2.60	35	0.23	14	0.09	15	0.10	53	0.35	1072	7.03
5 times	81	0.53	144	0.94	6	0.04	3	0.02	0	0	44	0.29	278	1.82
6 times	33	0.22	65	0.43	3	0.02	0	0	0	0	12	0.08	113	0.74
7 times	5	0.03	43	0.28	4	0.03	0	0	0	0	0	0	52	0.34
8 times	3	0.02	38	0.25	2	0.01	0	0	0	0	0	0	43	0.28
9 times	0	0	40	0.26	1	0.01	0	0	0	0	0	0	41	0.27
10 times	0	0	1	0.01	0	0	0	0	0	0	0	0	1	0.01
No Response	1	0.01	1	0.01	1	0.01	1	0.01	2	0.01	0	0	6	0.04
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-14: NUMBER OF POWER OUTAGE PER DAY (%)



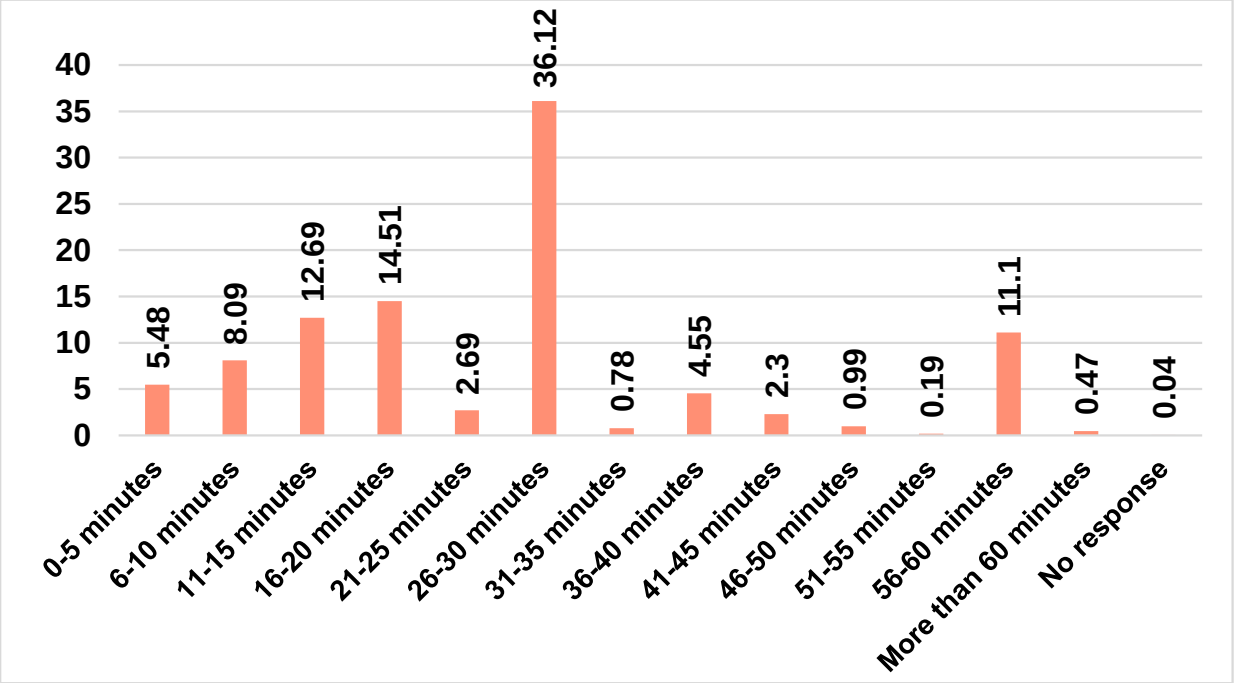
4.1.5.5 Duration of power per outage

Regarding the duration of power per outage, 36.12% customers mentioned '26 minutes-30 minutes', while 14.51% customers mentioned '16 minutes-20 minutes', followed by 12.69% (11-15 minutes),11.10% (56-60 minutes), 8.09% (6 -10 minutes), 5.48% (0-5 minutes), 4.55% (36-40 minutes), 2.69% (21-25 minutes), 2.30% (41-45 minutes), 0.99% (46-50 minutes), 0.78% (31-35 minutes), 0.47% (More than 60 minutes), 0.19% (51-55 minutes) and only 0.04% mentioned 'No response'. Details are shown below **(Table-19 and Figure-15):**

TABLE-19: DURATION OF POWER PER OUTAGE

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
0 minute-5 minutes	4	0.03	5	0.03	93	0.61	543	3.56	1	0.01	190	1.25	836	5.48
6 minutes-10 minutes	34	0.22	241	1.58	340	2.23	133	0.87	13	0.09	473	3.10	1234	8.09
11 minutes-15 minutes	124	0.81	145	0.95	634	4.16	223	1.46	162	1.06	646	4.24	1934	12.69
16 minutes-20 minutes	348	2.28	156	1.02	736	4.83	258	1.69	186	1.22	528	3.46	2212	14.51
21 minutes-25 minutes	22	0.14	38	0.25	178	1.17	42	0.28	58	0.38	72	0.47	410	2.69
26 minutes-30 minutes	1486	9.75	514	3.37	1702	11.16	708	4.64	703	4.61	394	2.58	5507	36.12
31 minutes-35 minutes	13	0.09	33	0.22	29	0.19	6	0.04	37	0.24	1	0.01	119	0.78
36 minutes-40 minutes	230	1.51	223	1.46	116	0.76	59	0.39	51	0.33	15	0.10	694	4.55
41 minutes-45 minutes	71	0.47	152	1.00	46	0.30	37	0.24	43	0.28	1	0.01	350	2.30
46 minutes-50 minutes	61	0.40	41	0.27	16	0.10	11	0.07	22	0.14	0	0	151	0.99
51 minutes-55 minutes	22	0.14	0	0	0	0	0	0	7	0.05	0	0	29	0.19
56 minutes-60 minutes	428	2.81	674	4.42	378	2.48	164	1.08	38	0.25	10	0.07	1692	11.10
More than 60 minutes	24	0.16	34	0.22	12	0.08	1	0.01	0	0	0	0	71	0.47
No response	1	0.01	0	0	2	0.01	1	0.01	1	0.01	1	0.01	6	0.04
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-15: DURATION OF POWER PER OUTAGE (%)



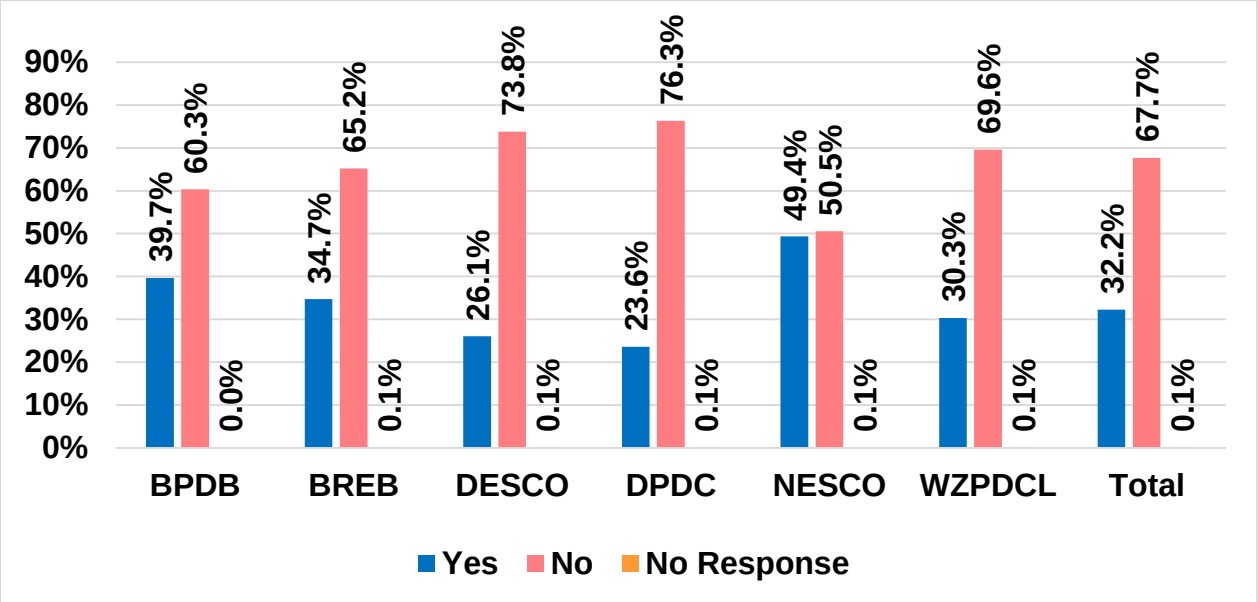
4.1.5.6 Status of Voltage Fluctuation

Regarding the Status of Voltage Fluctuation, 67.69% customers said 'No', while 32.23% customers said 'Yes' and only 0.09% customers said 'No response' to the question. Details are furnished below **(Table-20 and Figure-16)**:

TABLE-20: STATUS OF VOLTAGE FLUCTUATION

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	1138	7.46	783	5.14	1117	7.33	515	3.38	653	4.28	707	4.64	4913	32.23
No	1730	11.35	1471	9.65	3160	20.73	1668	10.94	668	4.38	1622	10.64	10319	67.69
No Response	0	0	2	0.01	5	0.03	3	0.02	1	0.01	2	0.01	13	0.09
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-16: STATUS OF VOLTAGE FLUCTUATION (%)



4.1.5.7 Time of Voltage Fluctuation

Table-21 and Figure-17 show the responses of the respondent regarding the Time of Voltage Fluctuation, 37.63% of the respondents seriously mentioned the Time of Voltage Fluctuation as 'Evening', while 27.84% respondents mentioned as 'Noon' followed by 19.68% (Night), 8.47% (Afternoon) and 6.37% (Morning).

TABLE-21: TIME OF VOLTAGE FLUCTUATION

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Morning	75	1.53	57	1.16	77	1.57	50	1.02	27	0.55	27	0.55	313	6.37
Noon	322	6.55	259	5.27	277	5.64	115	2.34	209	4.25	186	3.79	1368	27.84
Afternoon	113	2.30	42	0.85	99	2.02	39	0.79	93	1.89	30	0.61	416	8.47
Evening	453	9.22	245	4.99	449	9.14	214	4.36	239	4.86	249	5.07	1849	37.63
Night	175	3.56	180	3.66	215	4.38	97	1.97	85	1.73	215	4.38	967	19.68
Total	**1138**	**23.16**	**783**	**15.94**	**1117**	**22.74**	**515**	**10.48**	**653**	**13.29**	**707**	**14.39**	**4913**	**100**

FIGURE-17(a): TIME OF VOLTAGE FLUCTUATION (%)

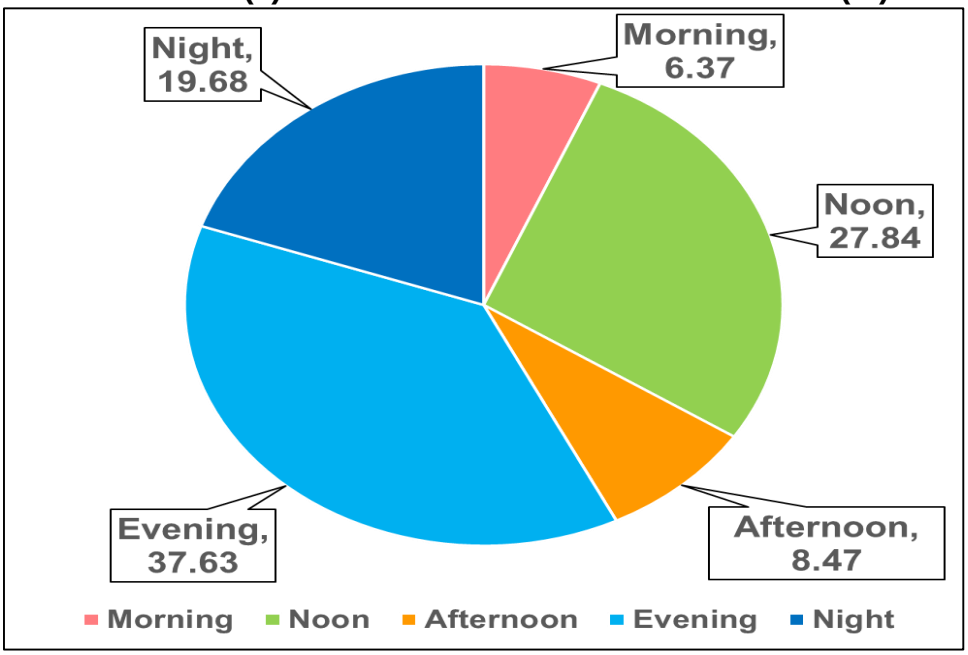
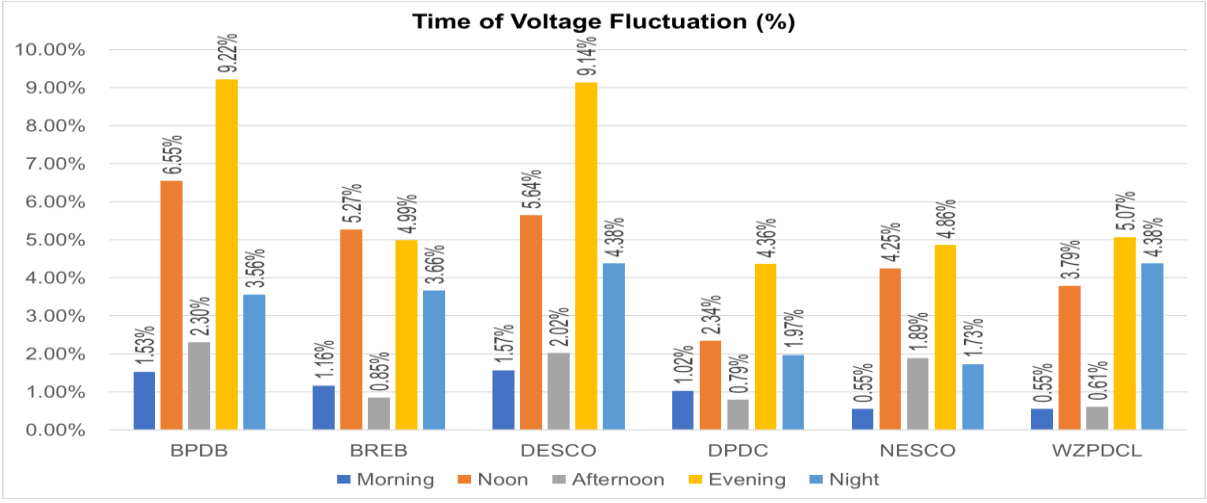


FIGURE-17(b): TIME OF VOLTAGE FLUCTUATION (%)



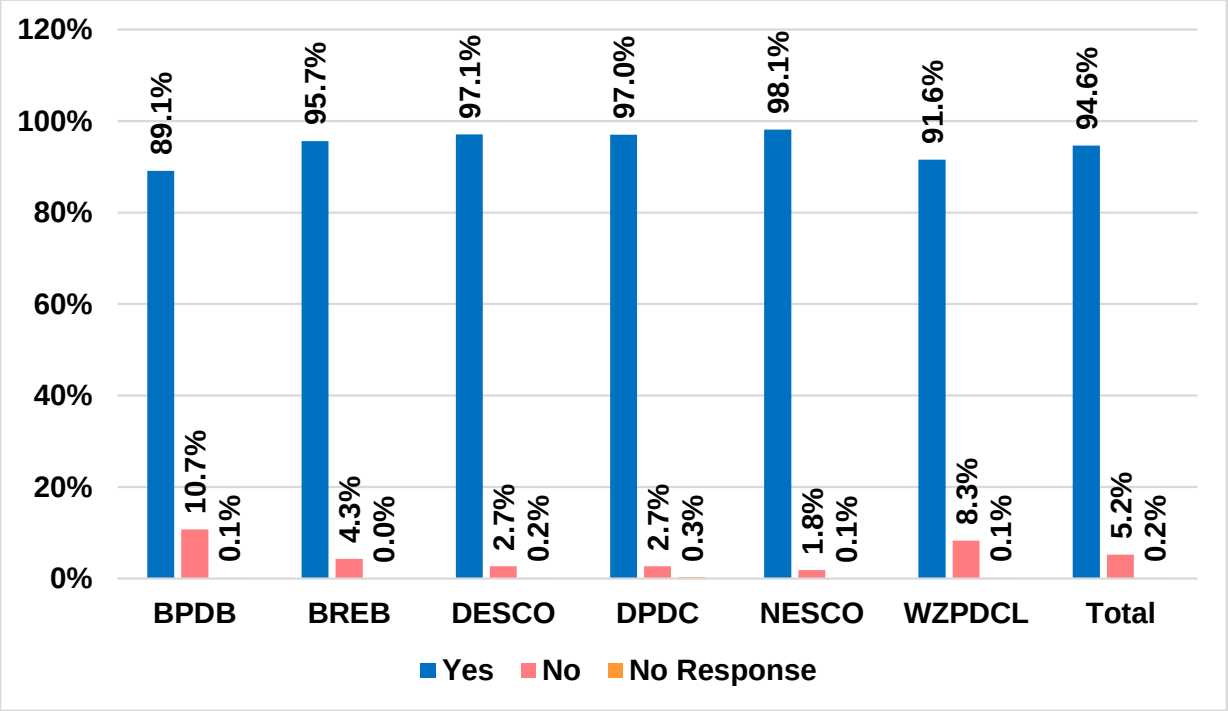
4.1.5.8 Power Distribution Organization/ Company takes necessary measures to supply power quickly in case of power outage due to natural calamities

Regarding the Power Distribution Organization/ Company takes necessary measures to supply power quickly in case of power outage due to natural calamities, 94.62% customers said 'Yes', while 5.23% customers said 'No' and only 0.15% customers said 'No response' to the question. Details are furnished below **(Table-22 and Figure-18):**

TABLE-22: POWER DISTRIBUTION ORGANIZATION/ COMPANY TAKES NECESSARY MEASURES TO SUPPLY POWER QUICKLY IN CASE OF POWER OUTAGE DUE TO NATURAL CALAMITIES

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	2556	16.77	2158	14.16	4158	27.27	2121	13.91	1297	8.51	2135	14.00	14425	94.62
No	308	2.02	97	0.64	116	0.76	59	0.39	24	0.16	193	1.27	797	5.23
No Response	4	0.03	1	0.01	8	0.05	6	0.04	1	0.01	3	0.02	23	0.15
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-18: POWER DISTRIBUTION ORGANIZATION/ COMPANY TAKES NECESSARY MEASURES TO SUPPLY POWER QUICKLY IN CASE OF POWER OUTAGE DUE TO NATURAL CALAMITIES (%)



4.1.6 Electricity Bill and Meter Reading (Only for Post-paid Meter)

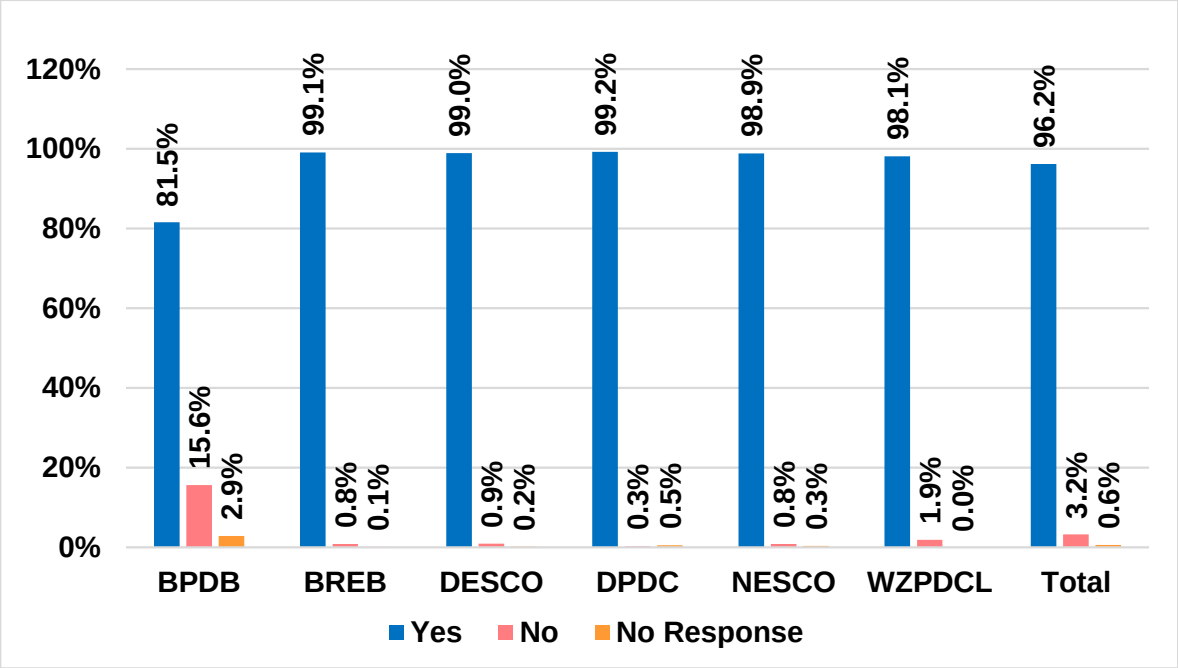
4.1.6.1 Status of Regular Meter reading by the Meter Reader per Month

Regarding the Status of Regular Meter reading by the Meter Reader per Month, 96.23% customers said 'Yes', while 3.18% customers said 'No' and only 0.59% customers 'No response' to the question. It is unveiled from the analysis that; the meter readers are sincere to their assigned duties and responsibilities. Details are furnished below **(Table-23 and Figure-19):**

TABLE-23: STATUS OF REGULAR METER READING BY THE METER READER PER MONTH

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	914	12.49	1806	24.69	1791	24.48	384	5.25	1307	17.86	838	11.45	7040	96.23
No	175	2.39	14	0.19	16	0.22	1	0.01	11	0.15	16	0.22	233	3.18
No Response	32	0.44	2	0.03	3	0.04	2	0.03	4	0.05	0	0	43	0.59
Total	**1121**	**15.32**	**1822**	**24.90**	**1810**	**24.74**	**387**	**5.29**	**1322**	**18.07**	**854**	**11.67**	**7316**	**100**

FIGURE-19: STATUS OF REGULAR METER READING BY THE METER READER PER MONTH (%)



4.1.6.2 Status of Satisfaction regarding service and behaviour of meter reader

The majority of the total respondents (47.01%) mentioned with regards to the Status of Satisfaction regarding service and behaviour of meter reader as 'Good', while 31.21% mentioned as 'Satisfied'. Others are mentioned as 'Very Good' (15.61%), 'Average' (4.17%), 'Below Average' (1.38%) and only 0.63% respondents mentioned as 'No Response'. Hence, it is clear from the analysis that the scenario of satisfaction is improving fast. This means that 93.83% of the customers are satisfied at different levels. Details are shown below **(Table-24 and Figure-20):**

TABLE-24: STATUS OF SATISFACTION REGARDING SERVICE AND BEHAVIOUR OF METER READER

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Below Average	75	1.03	8	0.11	15	0.21	1	0.01	1	0.01	1	0.01	101	1.38
Average	201	2.75	28	0.38	28	0.38	5	0.07	12	0.16	31	0.42	305	4.17
Satisfied	210	2.87	815	11.14	609	8.32	153	2.09	164	2.24	332	5.54	2283	31.21
Good	449	6.14	763	10.43	894	12.22	153	2.09	769	10.51	411	5.62	3439	47.01
Very Good	152	2.08	206	2.82	263	3.59	71	0.97	372	5.08	78	1.07	1142	15.61
No Response	34	0.46	2	0.03	1	0.01	4	0.05	4	0.05	1	0.01	46	0.63
Total	**1121**	**15.32**	**1822**	**24.90**	**1810**	**24.74**	**387**	**5.29**	**1322**	**18.07**	**854**	**11.67**	**7316**	**100**

FIGURE-20 (a): STATUS OF SATISFACTION REGARDING SERVICE AND BEHAVIOUR OF METER READER (%)

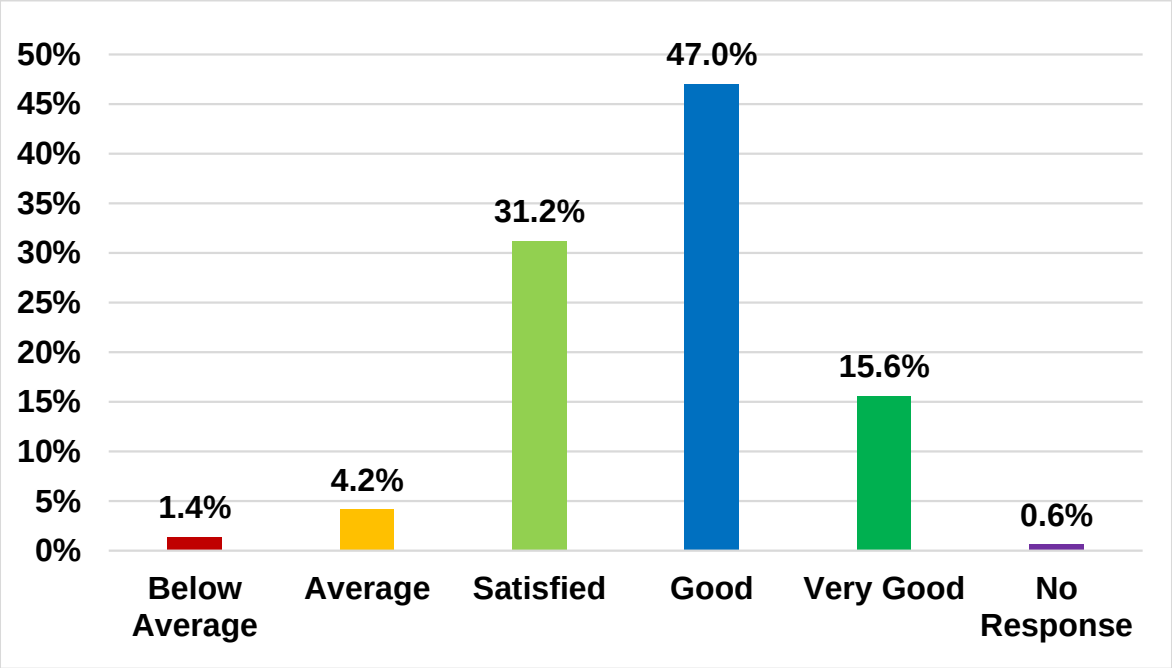
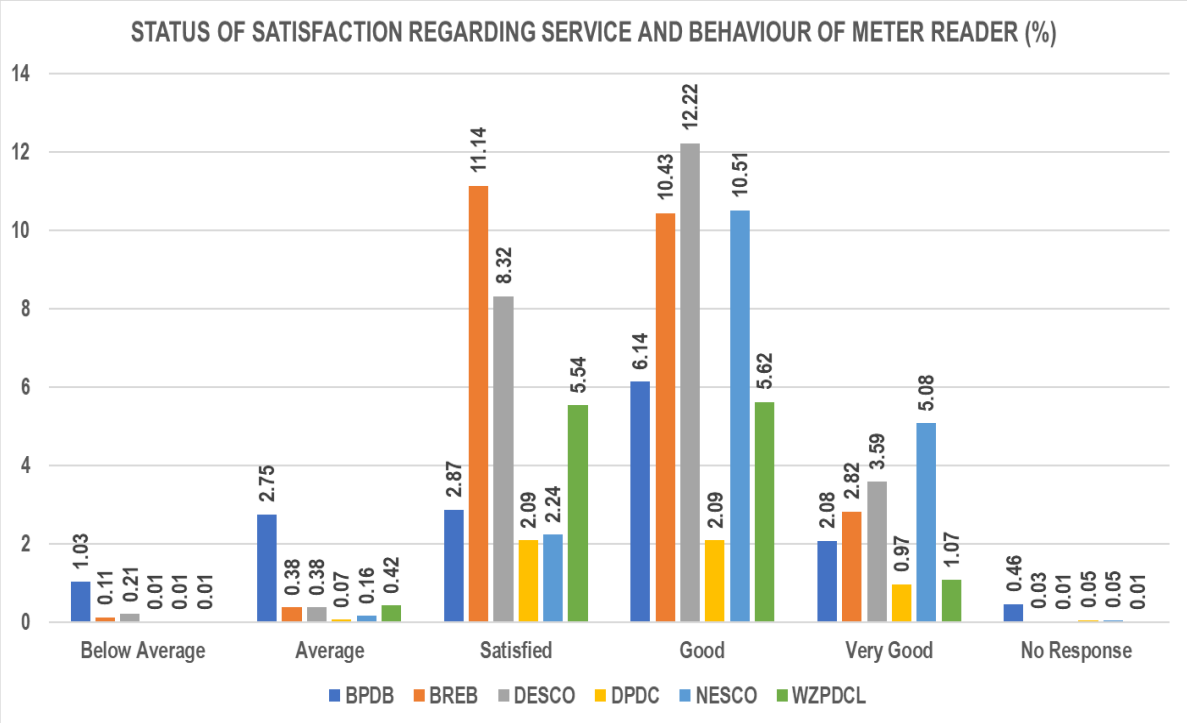


FIGURE-20 (b): STATUS OF SATISFACTION REGARDING SERVICE AND BEHAVIOUR OF METER READER (%)



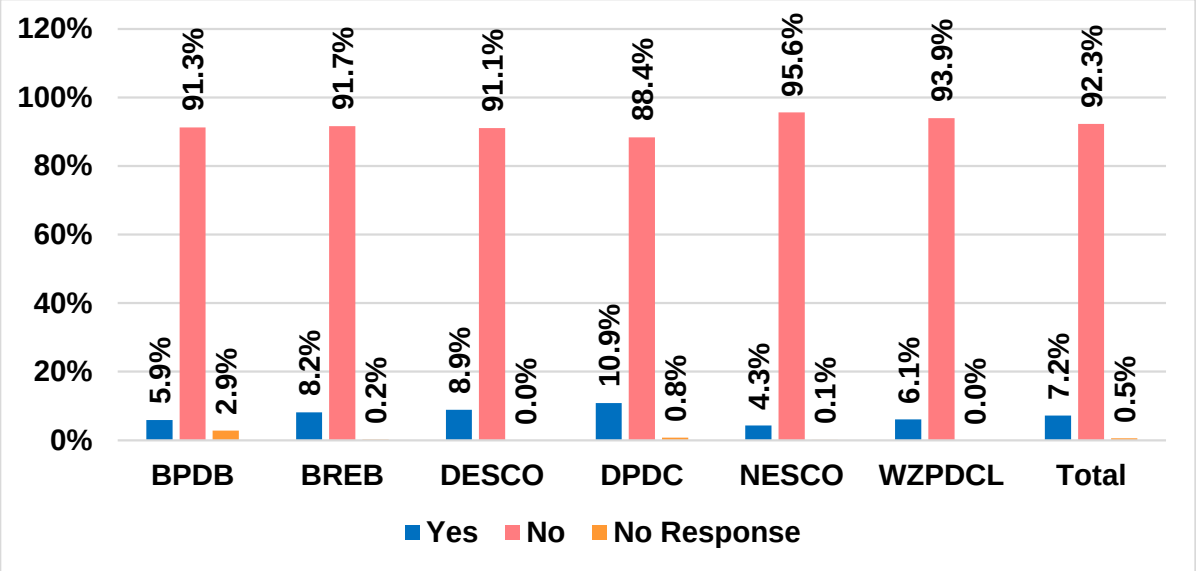
4.1.6.3 Status Regarding arrears electricity bills with next month's bill

The maximum number of customers (92.26%) mentioned with regard to the Status of the arrear's electricity bills with next month's bill as 'No', on the other hand 7.20% stated as 'Yes' and rest of the respondents (0.53%) mentioned as 'No Response'. It is clearly denoted from the analysis that the billing status is much better than before. Details are shown below **(Table-25 and Figure-21):**

TABLE-25: STATUS REGARDING ARREARS ELECTRICITY BILLS WITH NEXT MONTH'S BILL

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	66	0.90	149	2.04	161	2.20	42	0.57	57	0.78	52	0.71	527	7.20
No	1023	13.98	1670	22.83	1649	22.54	342	4.67	1264	17.28	802	10.96	6750	92.26
No Response	32	0.44	3	0.04	0	0	3	0.04	1	0.01	0	0	39	0.53
Total	**1121**	**15.32**	**1822**	**24.90**	**1810**	**24.74**	**387**	**5.29**	**1322**	**18.07**	**854**	**11.67**	**7316**	**100**

FIGURE-21: STATUS REGARDING ARREARS ELECTRICITY BILLS WITH NEXT MONTH'S BILL (%)



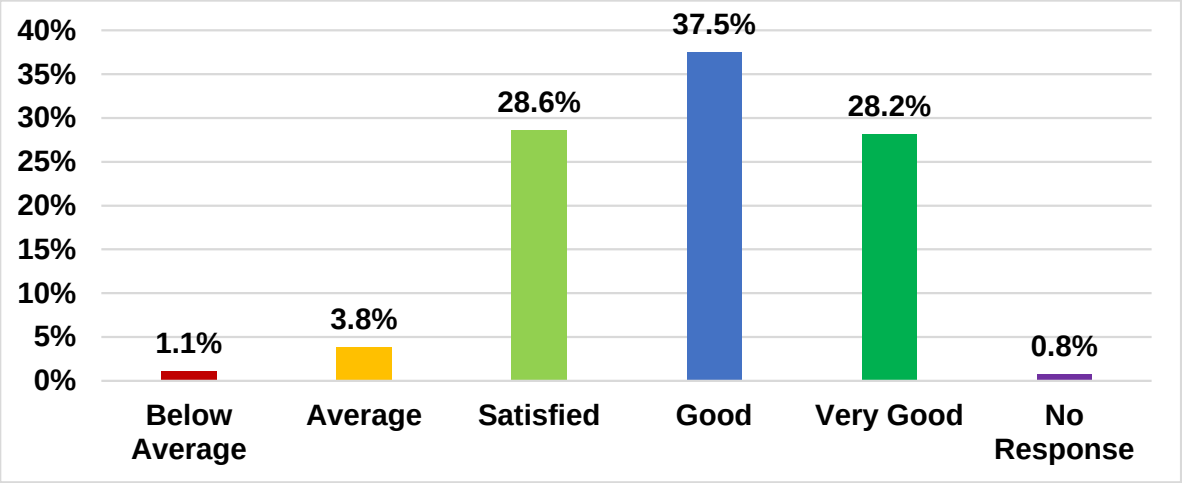
4.1.6.4 Customer's Opinion regarding arrears electricity bills with next month's bill

The majority of the total respondents (37.52%) mentioned with regards to arrears electricity bills with next month's bill as 'Good', while 28.62% mentioned as 'Satisfied'. Others are mentioned as 'Very Good' (28.20%), 'Average' (3.80%), 'Below Average' (1.08%) and only 0.78% mentioned 'No Response'. This means that 94.34% of the customers are satisfied at different levels. The result of the survey says that the electricity billing system is gradually improving than before. Details are shown below **(Table-26 and Figure-22):**

TABLE-26: CUSTOMERS OPINION REGARDING ARREARS ELECTRICITY BILLS WITH NEXT MONTH'S BILL

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Below Average	23	0.31	14	0.19	34	0.46	2	0.03	3	0.04	3	0.04	79	1.08
Average	35	0.48	118	1.61	61	0.83	13	0.18	14	0.19	37	0.51	278	3.80
Satisfied	147	2.01	716	9.79	583	7.97	168	2.30	121	1.65	359	4.91	2094	28.62
Good	465	6.36	600	8.20	854	11.67	143	1.95	321	4.39	362	4.95	2745	37.52
Very Good	417	5.70	370	5.06	265	3.62	57	0.78	861	11.77	93	1.27	2063	28.20
No Response	34	0.46	4	0.05	13	0.18	4	0.05	2	0.03	0	0	57	0.78
Total	**1121**	**15.32**	**1822**	**24.90**	**1810**	**24.74**	**387**	**5.29**	**1322**	**18.07**	**854**	**11.67**	**7316**	**100**

FIGURE-22: CUSTOMERS OPINION REGARDING ARREARS ELECTRICITY BILLS WITH NEXT MONTH'S BILL (%)



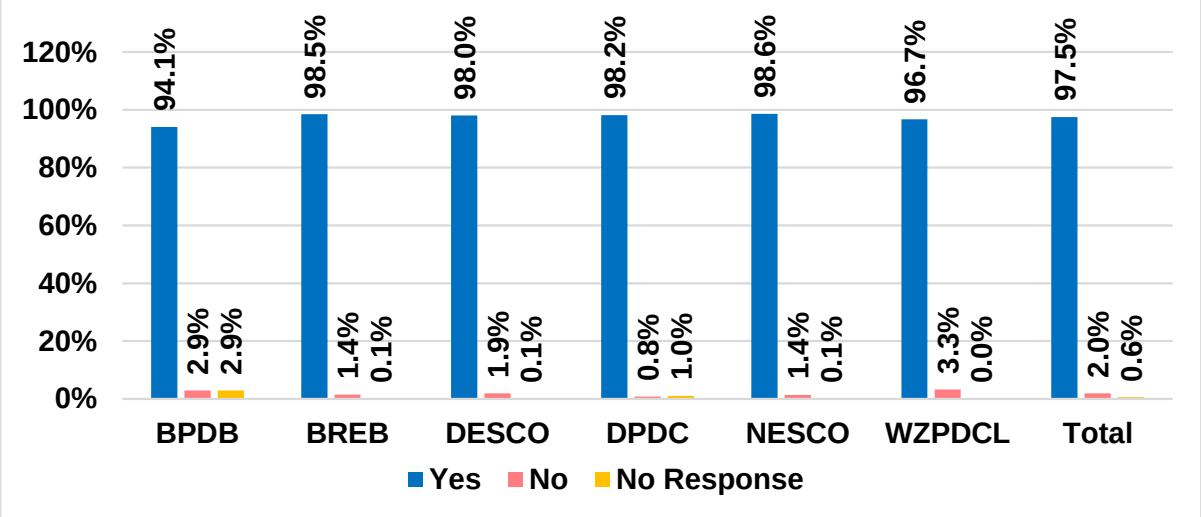
4.1.6.5 Perception of customer on getting monthly bill before the deadline of payment

Customers were asked whether they got monthly bill before the payment date in each month. In response to this question, overwhelming majority (97.48%) of total respondents replied 'Yes' that they had received a monthly bill before the payment date. On the other hand, 1.95% customers said 'No' and only 0.56% customers 'No Response' to the question. The analysis says that the billing process is in a satisfied level. Details are furnished below **(Table-27 and Figure-23):**

TABLE-27: PERCEPTION OF CUSTOMER ON GETTING MONTHLY BILL BEFORE THE DEADLINE OF PAYMENT

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	1055	14.42	1794	24.52	1774	24.25	380	5.19	1303	17.81	826	11.29	7132	97.48
No	33	0.45	26	0.36	35	0.48	3	0.04	18	0.25	28	0.38	143	1.95
No Response	33	0.45	2	0.03	1	0.01	4	0.05	1	0.01	0	0	41	0.56
Total	**1121**	**15.32**	**1822**	**24.90**	**1810**	**24.74**	**387**	**5.29**	**1322**	**18.07**	**854**	**11.67**	**7316**	**100**

FIGURE-23: PERCEPTION OF CUSTOMER ON GETTING MONTHLY BILL BEFORE THE DEADLINE OF PAYMENT



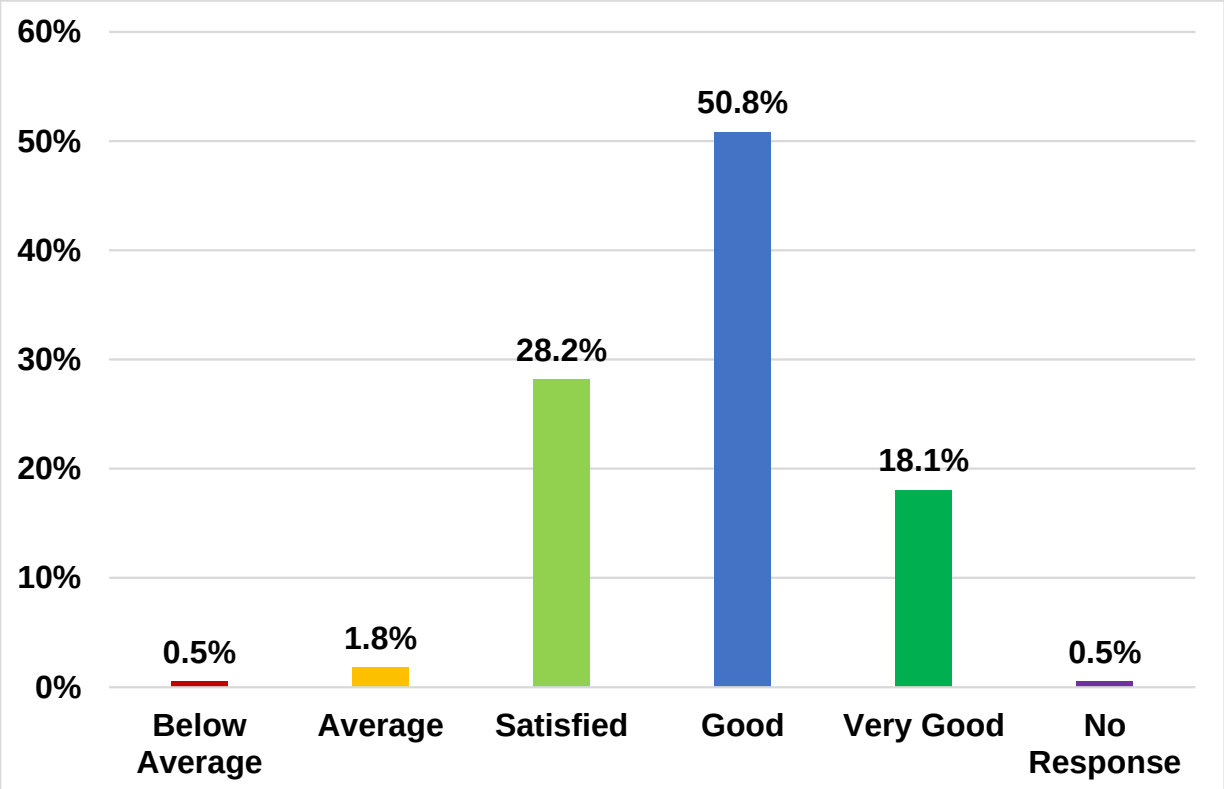
4.1.6.6 Status of Satisfaction regarding getting monthly bill before the deadline of payment

The majority of the total respondents (50.85%) mentioned with regards to the status of Satisfaction regarding getting a monthly bill before the deadline of payment as 'Good', while 28.16% mentioned as 'Satisfied'. Others are mentioned as 'Very Good' (18.07%), 'Average' (1.85%), 'Below Average' (0.53%) and only 0.55% mentioned 'No Response'. This means that 97.08% of the customers are satisfied at different levels. The analysis says that the billing process is in a gratified level. Details are shown below **(Table-28 and Figure-24):**

TABLE-28: STATUS OF SATISFACTION REGARDING GETTING MONTHLY BILL BEFORE THE DEADLINE OF PAYMENT

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Below Average	14	0.19	2	0.03	11	0.15	0	0	5	0.07	7	0.10	39	0.53
Average	54	0.74	21	0.29	28	0.38	4	0.05	10	0.14	18	0.25	135	1.85
Satisfied	233	3.18	718	9.81	525	7.18	129	1.76	116	1.59	339	4.63	2060	28.16
Good	539	7.37	868	11.86	961	13.14	195	2.67	760	10.39	397	5.43	3720	50.85
Very Good	249	3.40	210	2.87	285	3.90	56	0.77	429	5.86	93	1.27	1322	18.07
No Response	32	0.44	3	0.04	0	0	3	0.04	2	0.03	0	0	40	0.55
Total	**1121**	**15.32**	**1822**	**24.90**	**1810**	**24.74**	**387**	**5.29**	**1322**	**18.07**	**854**	**11.67**	**7316**	**100**

FIGURE-24: STATUS OF SATISFACTION REGARDING GETTING MONTHLY BILL BEFORE THE DEADLINE OF PAYMENT (%)



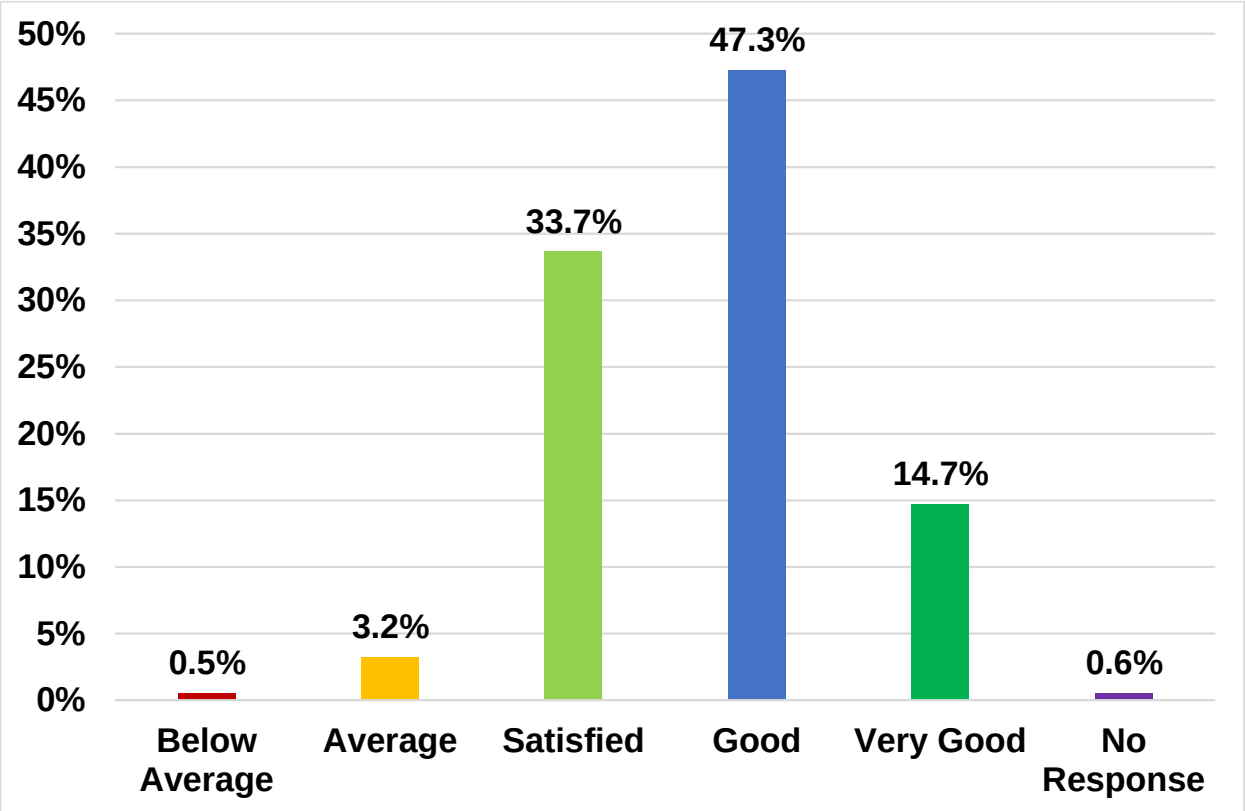
4.1.6.7 Opinion regarding the time given to pay the electricity bill in every month

The majority of the total respondents (47.31%) mentioned with regards to the opinion regarding the time given to pay the electricity bill in every month as 'Good', while 33.56% mentioned as 'Satisfied'. Others are mentioned as 'Very Good' (14.72%), 'Average' (3.24%), 'Below Average' (0.53%) and only 0.55% mentioned 'No Response'. This means that 95.59% of the customers are satisfied at different levels. The analysis says that the opinion is very optimistic than past. Details are shown below **(Table-29 and Figure-25)**:

TABLE-29: OPINION REGARDING THE TIME GIVEN TO PAY THE ELECTRICITY BILL IN EVERY MONTH

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Below Average	10	0.14	5	0.07	9	0.12	1	0.01	6	0.08	8	0.11	39	0.53
Average	83	1.13	43	0.59	40	0.55	9	0.12	42	0.57	20	0.27	237	3.24
Satisfied	299	4.09	850	11.62	651	8.90	147	2.01	154	2.10	361	4.93	2462	33.65
Good	524	7.16	702	9.60	861	11.77	171	2.34	819	11.19	384	5.25	3461	47.31
Very Good	172	2.35	220	3.01	248	3.39	56	0.77	300	4.10	81	1.11	1077	14.72
No Response	33	2.35	2	0.03	1	0.01	3	0.04	1	0.01	0	0	40	0.55
Total	**1121**	**15.32**	**1822**	**24.90**	**1810**	**24.74**	**387**	**5.29**	**1322**	**18.07**	**854**	**11.67**	**7316**	**100**

FIGURE-25: OPINION REGARDING THE TIME GIVEN TO PAY THE ELECTRICITY BILL IN EVERY MONTH (%)



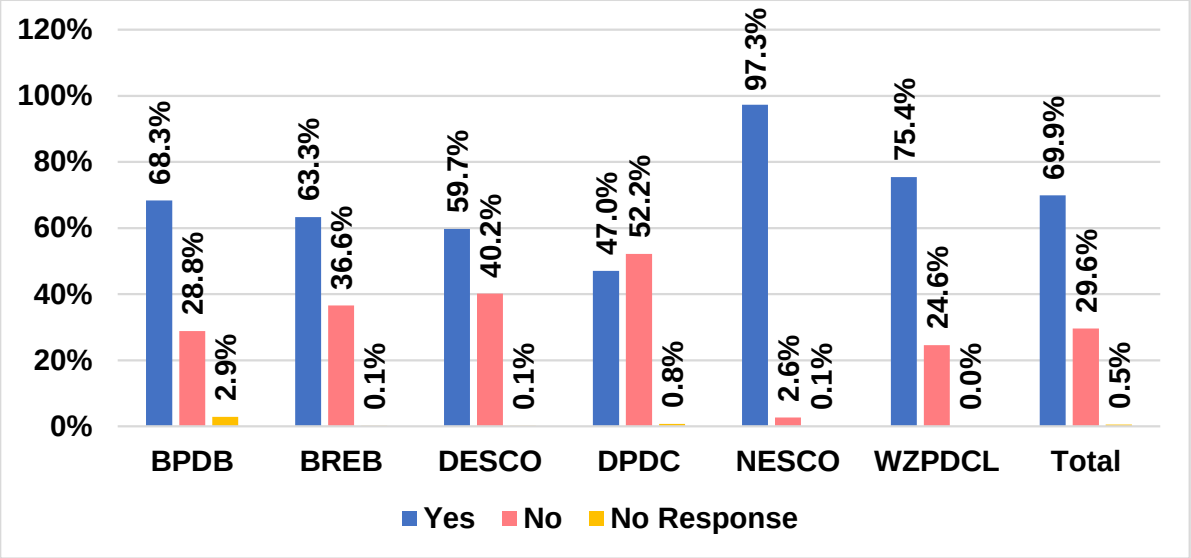
4.1.6.8 Status of Electricity bill payment through mobile or online

Amongst the total respondents, most (69.87%) of the respondent mentioned 'Yes'. On the other hand, 29.58% respondents said 'No' and only 0.55% mentioned 'No Response' to the question. It is reviled from the analysis that, at present peoples are feeling strong interest to pay their monthly electricity bill through mobile or online than before. Details are furnished below **(Table-30 and Figure-26)**:

TABLE-30: STATUS OF ELECTRICITY BILL PAYMENT THROUGH MOBILE OR ONLINE

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	766	10.47	1153	15.76	1081	14.78	182	2.49	1286	17.58	644	8.80	5112	69.87
No	323	4.41	667	9.12	727	9.94	202	2.76	35	0.48	210	2.87	2164	29.58
No Response	32	0.44	2	0.03	2	0.03	3	0.04	1	0.01	0	0	40	0.55
Total	**1121**	**15.32**	**1822**	**24.90**	**1810**	**24.74**	**387**	**5.29**	**1322**	**18.07**	**854**	**11.67**	**7316**	**100**

FIGURE-26: STATUS OF ELECTRICITY BILL PAYMENT THROUGH MOBILE OR ONLINE (%)



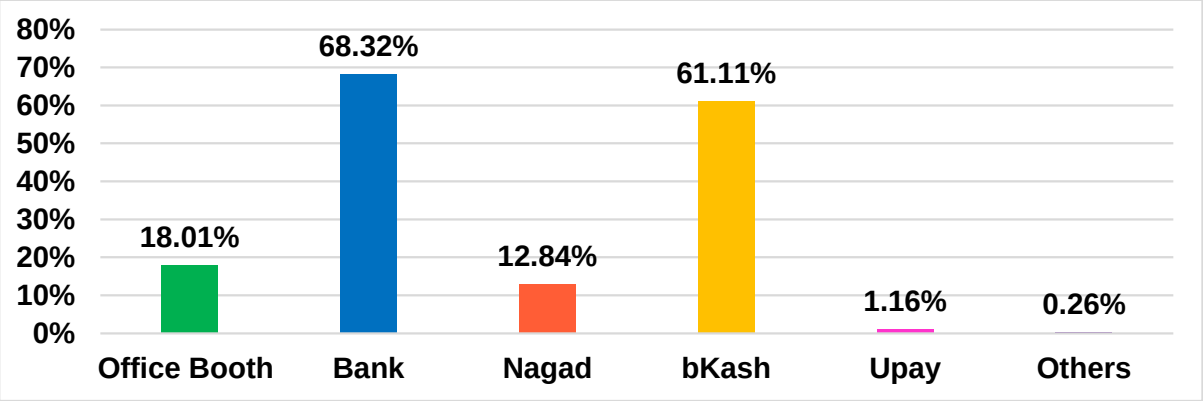
4.1.6.9 Status of medium for payment of electricity bill (Multiple Response)

Table-31 and Figure-27 shows the responses of the respondent regarding the Status of medium for payment of electricity bill, 68.32% of the respondents mentioned the 'Bank', while 61.11% respondents mentioned as 'bKash' followed by 18.01% (Office Booth), 12.84% (Nagad), 1.16% (Upay) and Only 0.26% mentioned (Others). The results of the findings portray the fast changing of a person's mentality to accept the digitalization of payment.

TABLE-31: STATUS OF MEDIUM FOR PAYMENT OF ELECTRICITY BILL (MULTIPLE RESPONSE)

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Office Booth	21	0.29	742	10.23	319	4.40	96	1.32	23	0.32	105	1.45	1306	18.01
Bank	857	11.82	1119	15.43	1237	17.06	268	3.70	1044	14.39	430	5.93	4955	68.32
Nagad	163	2.25	104	1.43	125	1.72	11	0.15	448	6.18	80	1.10	931	12.84
bKash	668	9.21	994	13.70	890	12.27	111	1.53	1210	16.68	559	7.71	4432	61.11
Upay	34	0.47	14	0.19	9	0.12	0	0	27	0.37	0	0	84	1.16
Others	1	0.01	3	0.04	11	0.15	1	0.01	2	0.03	1	0.01	19	0.26

FIGURE-27: STATUS OF MEDIUM FOR PAYMENT OF ELECTRICITY BILL (%) (MULTIPLE RESPONSE)



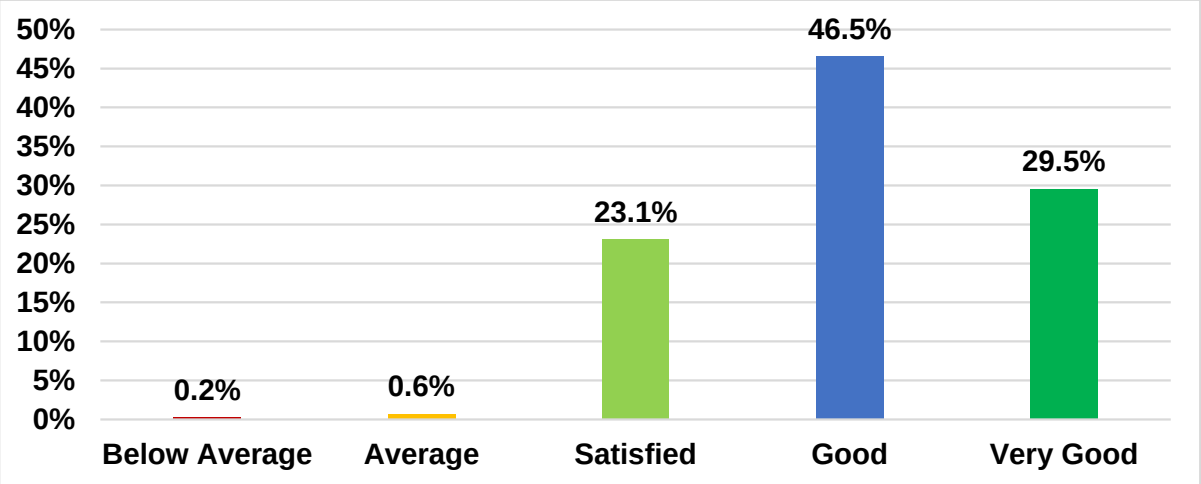
4.1.6.10 Opinion regarding the payment of electricity bill through mobile/online

The majority of the total respondents (46.52%) mentioned with regards to the opinion regarding payment of electricity bill through mobile/online as 'Good', while 29.54% mentioned as 'Very Good'. Others are mentioned as 'Satisfied' (23.06%), followed by 'Average' (0.65%) and only 0.23% of the respondents mentioned as 'Below Average'. This means that 99.12% of the customers are satisfied at different levels. The scenario of the payment of the electricity bill through mobile/online is the proof of acceptance of digitalization by the Customers of six utilities. Details are shown below **(Table-32 and Figure-28):**

TABLE-32: OPINION REGARDING PAYMENT OF ELECTRICITY BILL THROUGH MOBILE/ONLINE

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Below Average	5	0.10	2	0.04	4	0.08	1	0.02	0	0	0	0	12	0.23
Average	7	0.14	5	0.10	14	0.27	1	0.02	0	0	6	0.12	33	0.65
Satisfied	62	1.21	424	8.29	317	6.20	75	1.47	62	1.21	239	4.68	1179	23.06
Good	383	7.49	483	9.45	467	9.14	76	1.49	663	12.97	306	5.99	2378	46.52
Very Good	309	6.04	239	4.68	279	5.46	29	0.57	561	10.97	93	1.82	1510	29.54
Total	**766**	**14.98**	**1153**	**22.55**	**1081**	**21.15**	**182**	**3.56**	**1286**	**25.16**	**644**	**12.60**	**5112**	**100**

FIGURE-28: OPINION REGARDING PAYMENT OF ELECTRICITY BILL THROUGH MOBILE/ONLINE (%)



4.1.6.11 Status of receiving annual clearance certificate of electricity bill payment

Table-33, Figure-29 and Figure-30 shows the responses of the respondent regarding the Status of receiving annual clearance certificate of electricity bill payment. 51.76% of the respondents mentioned 'No', they are not receiving annual clearance certificate, while 47.44% respondents mentioned 'Yes' and only 0.79% mentioned (No Response). The analysis says that the authority of the six utilities needs to pay their attention in this matter seriously to keep the satisfaction level of their customers and they will have to make sure that each and every customer will get their annual clearance certificate on time.

TABLE-33: STATUS OF RECEIVING ANNUAL CLEARANCE CERTIFICATE OF ELECTRICITY BILL PAYMENT

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	40	0.55	729	9.96	1452	19.85	238	3.25	971	13.27	41	0.56	3471	47.44
No	1042	14.24	1089	14.89	355	4.85	139	1.90	350	4.78	812	11.10	3787	51.76
No Response	39	0.53	4	0.05	3	0.04	10	0.14	1	0.01	1	0.01	58	0.79
Total	**1121**	**15.32**	**1822**	**24.90**	**1810**	**24.74**	**387**	**5.29**	**1322**	**18.07**	**854**	**11.67**	**7316**	**100**

FIGURE-29: STATUS OF RECEIVING ANNUAL CLEARANCE CERTIFICATE OF ELECTRICITY BILL PAYMENT (%)

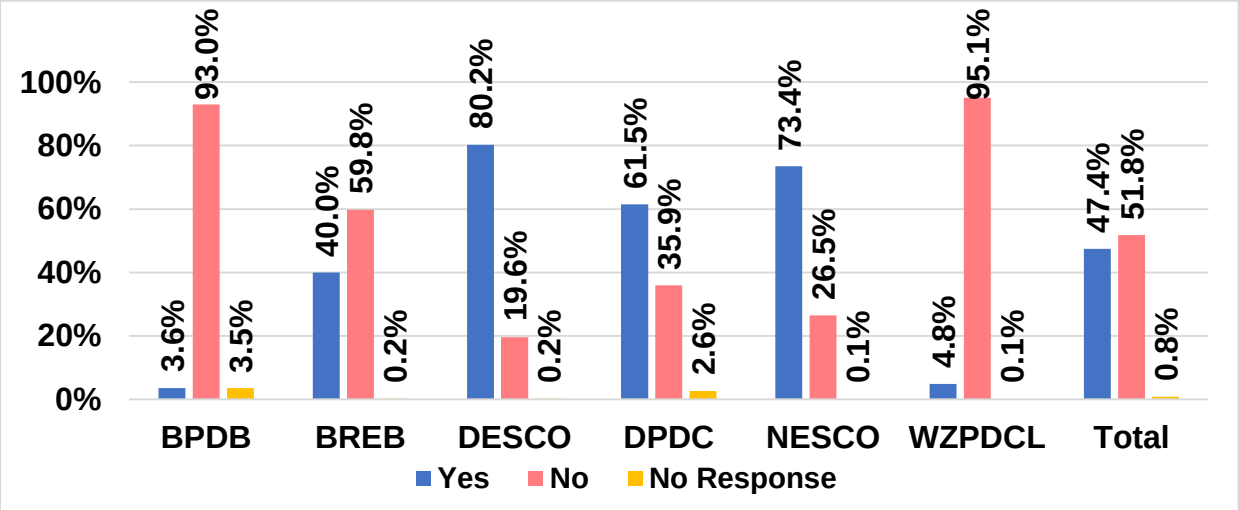
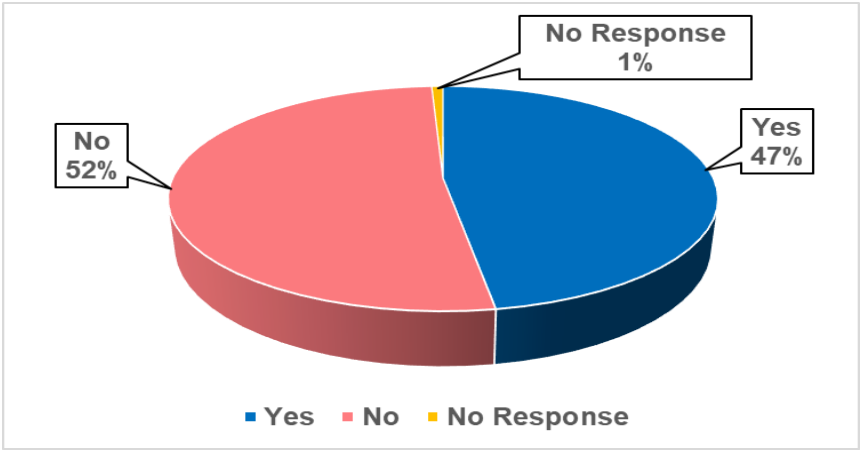


FIGURE-30: STATUS OF RECEIVING ANNUAL CLEARANCE CERTIFICATE OF ELECTRICITY BILL PAYMENT (%)



4.1.6.12 Status of time of receiving the annual clearance certificate of electricity bill payment

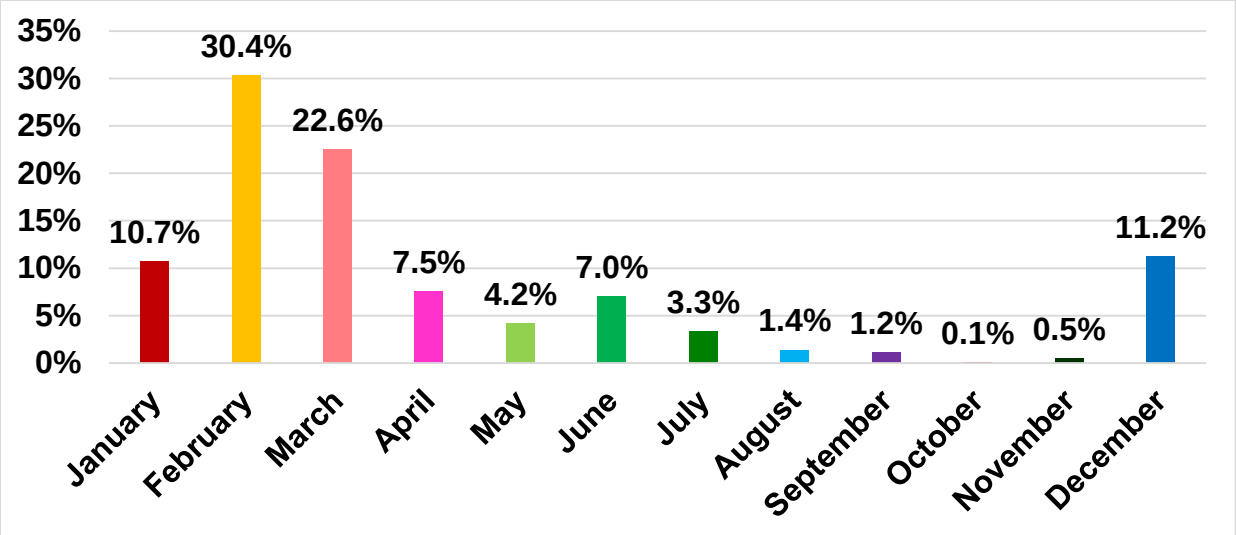
The clearance certificate is generally issued after the customer has paid fully their electricity bills for a particular year. In the survey, majority of the total respondents (30.37%) mentioned that they received their annual clearance certificate in 'February', while 22.56% in 'March'. Others mentioned in 'December' (11.21%), followed by 'January' (10.75%), 'April' (7.55%), 'June' (7.03%), 'May' (4.18%), 'July' (3.28%), 'August' (1.38%), 'September' (1.15%), 'November' (0.46%) and only 0.09% mentioned in 'October'. It is coming-out from the analysis that six utilities need to pay immediate attention to fixed the month to provide the annual clearance certificate of electricity bill payment to eliminate the dissatisfaction from the customer's mind. Details are shown below **(Table-34 and Figure-31)**:

TABLE-34: STATUS OF TIME OF RECEIVING THE ANNUAL CLEARANCE CERTIFICATE OF ELECTRICITY BILL PAYMENT

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
January	0	0	101	2.91	225	6.48	12	0.35	26	0.75	9	0.26	373	10.75
February	8	0.23	130	3.75	86	2.48	3	0.09	824	23.74	3	0.09	1054	30.37
March	21	0.61	308	8.87	310	8.93	59	1.70	80	2.30	5	0.14	783	22.56
April	7	0.20	83	2.39	111	3.20	51	1.47	2	0.06	8	0.23	262	7.55
May	0	0	44	1.27	85	2.45	9	0.26	0	0	7	0.20	145	4.18
June	1	0.03	21	0.61	153	4.41	48	1.38	19	0.55	2	0.06	244	7.03
July	2	0.06	11	0.32	84	2.42	14	0.40	2	0.06	1	0.03	114	3.28
August	0	0	0	0	35	1.01	10	0.29	2	0.06	1	0.03	48	1.38
September	0	0	0	0	38	1.09	0	0	0	0	2	0.06	40	1.15
October	0	0	0	0	1	0.03	0	0	2	0.06	0	0	3	0.09
November	0	0	0	0	11	0.32	1	0.03	4	0.12	0	0	16	0.46
December	1	0.03	31	0.39	313	9.02	31	0.89	10	0.29	3	0.09	389	11.21
Total	**40**	**1.15**	**729**	**21.00**	**1452**	**41.83**	**238**	**6.86**	**971**	**27.97**	**41**	**1.18**	**3471**	**100**

Note: From the data on issuance of annual clearance certificate by utilities, it was reported by utility officials that the certificate is issued in different times of the year. For instance, DPDC issued in May-June, DESCO in March-April, BREB in February-March, BPDB in March-May, WZPDCL in March-April and only NESCO uploaded their annual clearance certificate in its website.

FIGURE-31: STATUS OF TIME OF RECEIVING THE ANNUAL CLEARANCE CERTIFICATE OF ELECTRICITY BILL PAYMENT (%)



4.1.7 Complaints and Remedies

4.1.7.1 Status of Lodged complaints

Maximum number of customers (92.97%) mentioned 'Yes', we lodged complaints, while 6.96% mentioned 'No' and only 0.7% (No Response). The analysis indicates that six utilities need to pay attention to resolving the complaint as quickly as possible in order to lower the complaint rate. Details are given below **(Table-35 and Figure-32):**

TABLE-35: STATUS OF LODGED COMPLAINTS

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	2608	17.71	2185	14.33	3748	24.59	2100	13.78	1278	8.38	2254	14.79	14173	92.97
No	257	1.69	68	0.45	530	3.48	86	0.56	43	0.28	77	0.51	1061	6.96
No Response	3	0.02	3	0.02	4	0.03	0	0	1	0.01	0	0	11	0.07
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-32 (a): STATUS OF LODGED COMPLAINTS (%)

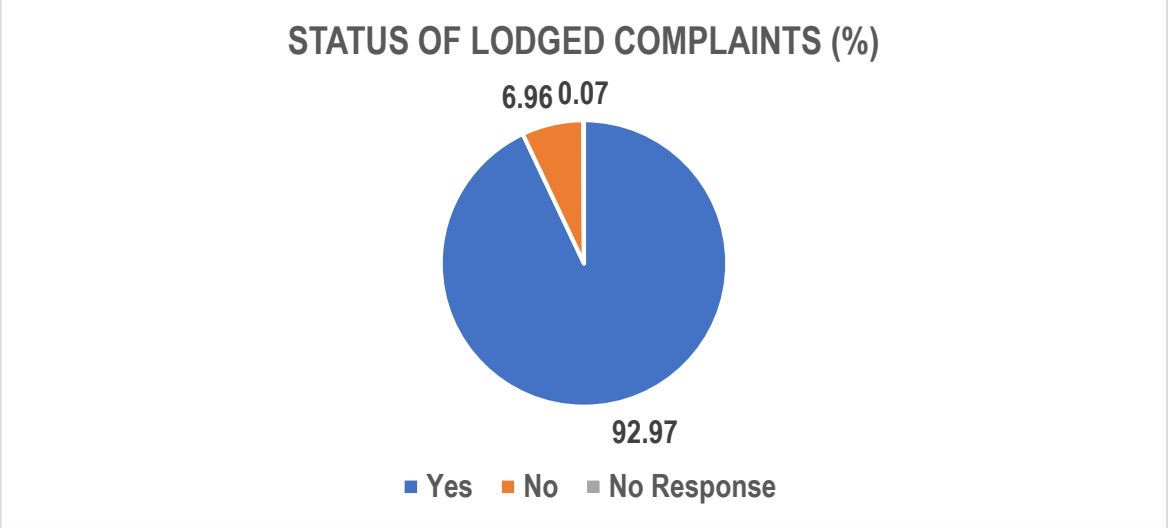
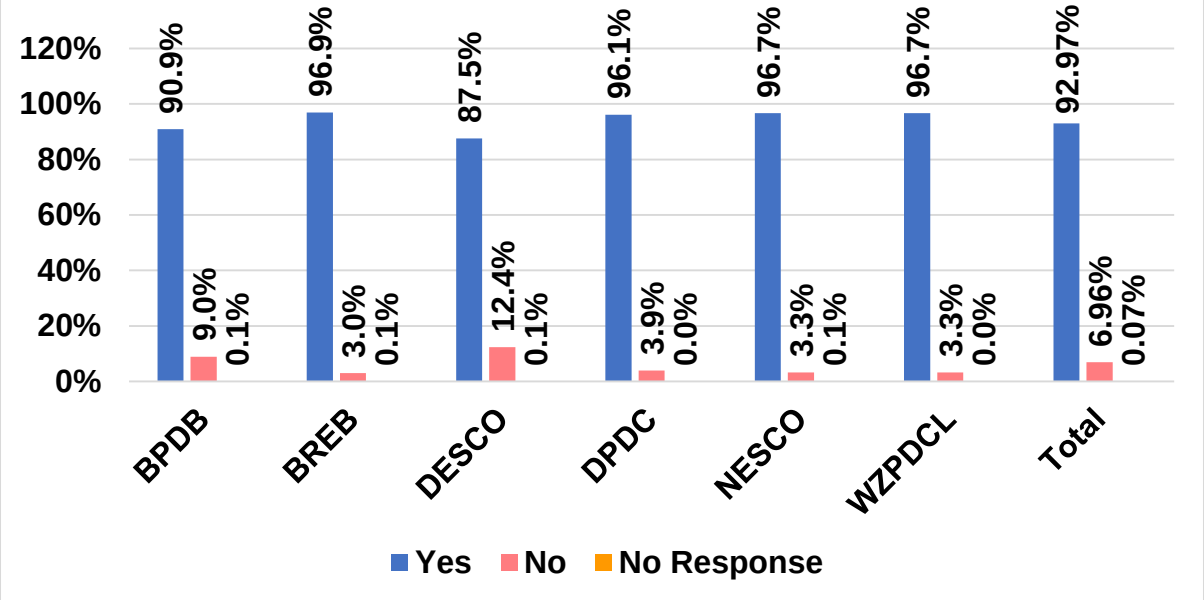


FIGURE-32 (b): STATUS OF LODGED COMPLAINTS (%)



4.1.7.2 Types of Complaints (Multiple Response)

Maximum number of customer (64.21%) mentioned their complaints as 'Interruption of Electricity', while 34.65% customer mentioned complaints as 'Load Shedding', followed by 28.93% mentioned 'Additional electricity bills', 17.24% mentioned 'Others' and rest of the complainer (16.31%) made complaints against 'Voltage Fluctuations'. The analysis shows that six utilities need to pay attention to provide appropriate solutions against the lodge complaints to reduce the rate of complaints, which will ultimately reduce the dissatisfaction of the customers and create a healthy environment in the power sector. Details are stated below **(Table-36 Figure-33 and Figure-34):**

TABLE-36: TYPES OF COMPLAINTS (MULTIPLE RESPONSE)

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Interruption of Electricity	1752	12.44	1515	10.76	2042	14.50	1393	9.89	769	5.46	1568	11.14	9039	64.21
Load Shedding	1158	8.23	923	6.56	1037	7.37	751	5.33	671	4.77	338	2.40	4878	34.65
Voltage Fluctuations	458	3.25	337	2.39	585	4.16	154	1.09	450	3.20	312	2.22	2296	16.31
Additional electricity bills	809	5.75	644	4.57	861	6.12	274	1.95	779	5.53	706	5.01	4073	28.93
Others	426	3.03	233	1.66	714	5.07	530	3.76	18	0.13	506	3.59	2427	17.24

FIGURE-33: TYPES OF COMPLAINTS (UTILITY WISE) (%) (MULTIPLE RESPONSE)

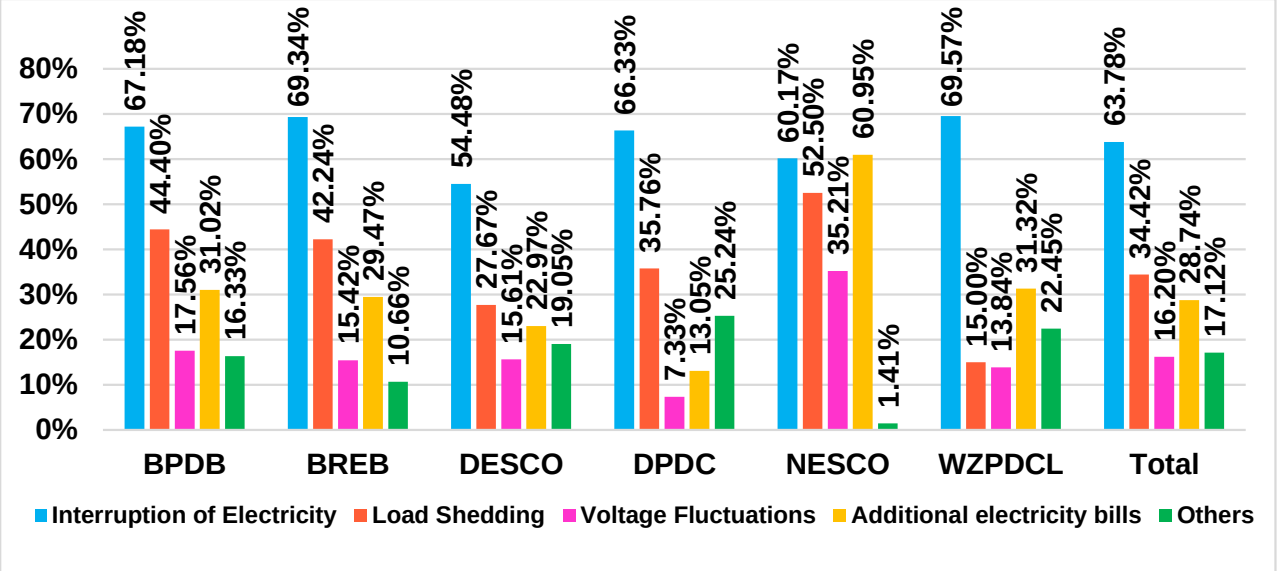
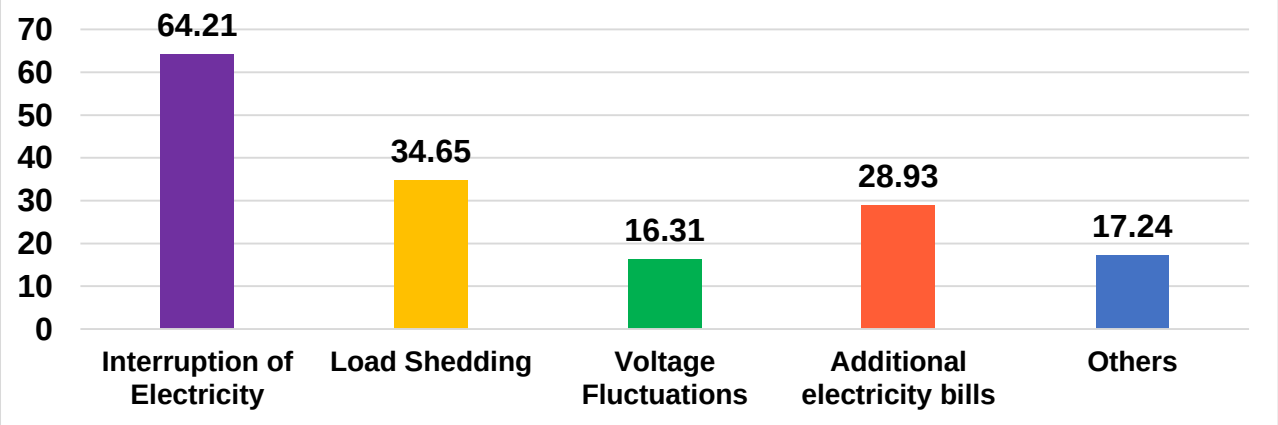


FIGURE-34: TYPES OF COMPLAINTS (%) (MULTIPLE RESPONSE)



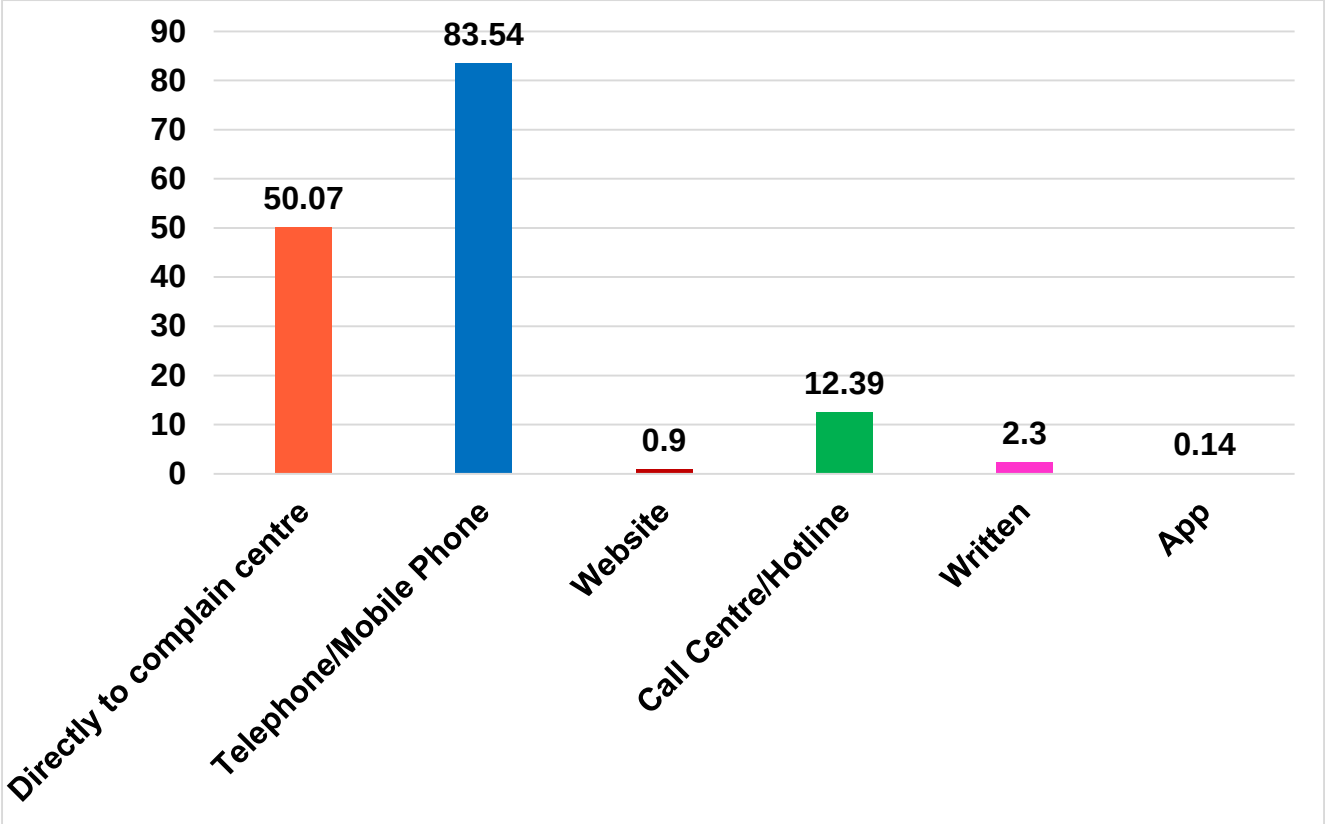
4.1.7.3 Types of Medium used for lodging Complaints (Multiple Response)

Maximum number of customers (83.54%) lodged complaints over 'Telephone/Mobile Phone', while 50.07% customer complaint lodged 'Directly to Complain Centre', followed by 12.39% complaint lodged via 'Call Centre[9]', 2.30% (Written), 0.90% (Website), 0.66% (Others) and only 0.14% customers lodged their complaint via 'App'. The analysis shows that customers are lodging their complaints by using different mediums with an expectation to get its proper solutions instantly. Six utilities need to take care of that. These actions will pivotal role in improving customer's satisfaction level. Details are stated below **(Table-37, Figure-35 and Figure-36):**

TABLE-37: TYPES OF MEDIUM USED FOR LODGING COMPLAINTS (MULTIPLE RESPONSE)

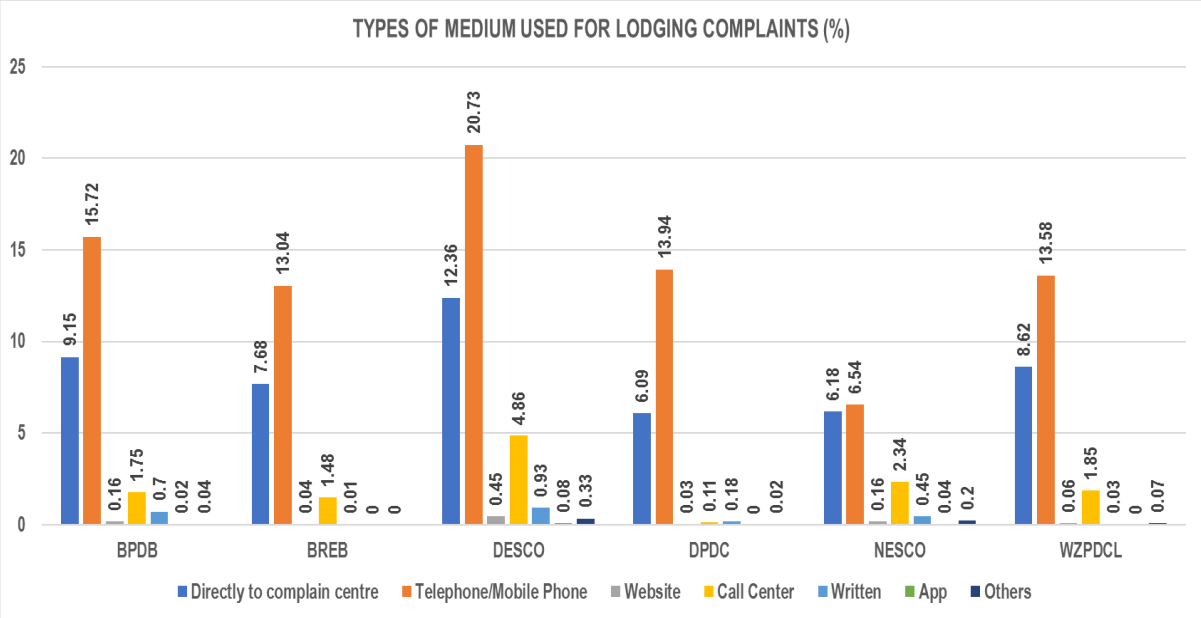
Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Directly to complain centre	1293	9.15	10867	7.68	1748	12.36	861	6.09	873	6.18	1218	8.62	7079	50.07
Telephone/Mobile Phone	2222	15.72	1843	13.04	2930	20.73	1971	13.94	924	6.54	1920	13.58	11810	83.54
Website	22	0.16	5	0.04	64	0.45	4	0.03	23	0.16	9	0.06	127	0.90
Call Centre/ Hotline	247	1.75	209	1.48	687	4.86	15	0.11	331	2.34	262	1.85	1751	12.39
Written	99	0.70	1	0.01	132	0.93	26	0.18	63	0.45	4	0.03	325	2.30
App	3	0.02	0	0	11	0.08	0	0	6	0.04	0	0	20	0.14
Others	5	0.04	0	0	47	0.33	3	0.02	28	0.20	10	0.07	93	0.66

FIGURE-35: TYPES OF MEDIUM USED FOR LODGING COMPLAINTS (%) (MULTIPLE RESPONSE)



[9] BPDB Hotline: 16200, BREB: Narayanganj-01769404031-2 and Mymensingh- 01769404009-11, DESCO Hotline: 16120, DPDC Call Centre: 16116, NESCO (Information & Services): 16603, WZPDCL Hotline: 16117 and Power Division Call Centre: 16999.

FIGURE-36: TYPES OF MEDIUM USED FOR LODGING COMPLAINTS (%) (UTILITY WISE) (MULTIPLE RESPONSE)



4.1.7.4 Status of received service within the desired time

The majority of the customers (92.97%) stated 'Yes', they received the services within the desired time from the six utilities, while 5.52% of the customers mentioned 'No Response' and only 1.52% stated 'No', they didn't receive the serviced as they desired. The analysis unveils that six utilities need to make a proactive action plan to provide the services which are deeply expected by their valuable customers. This action will improve their services furthermore. Details are provided below **(Table-38, Figure-37 and Figure-38):**

TABLE-38: STATUS OF RECEIVED SERVICE WITHIN THE DESIRED TIME

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	2599	17.05	2183	14.32	3755	24.63	2118	13.89	1279	8.39	2239	14.69	14173	92.97
No	108	0.71	7	0.05	86	0.56	9	0.06	1	0.01	20	0.13	231	1.52
No Response	161	1.06	66	0.43	441	2.89	59	0.39	42	0.28	72	0.47	841	5.52
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-37: STATUS OF RECEIVED SERVICE WITHIN THE DESIRED TIME (%)

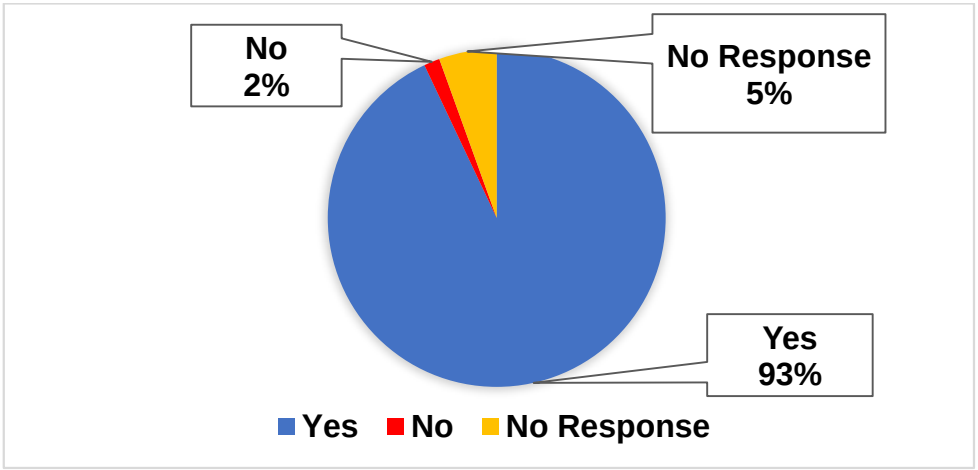
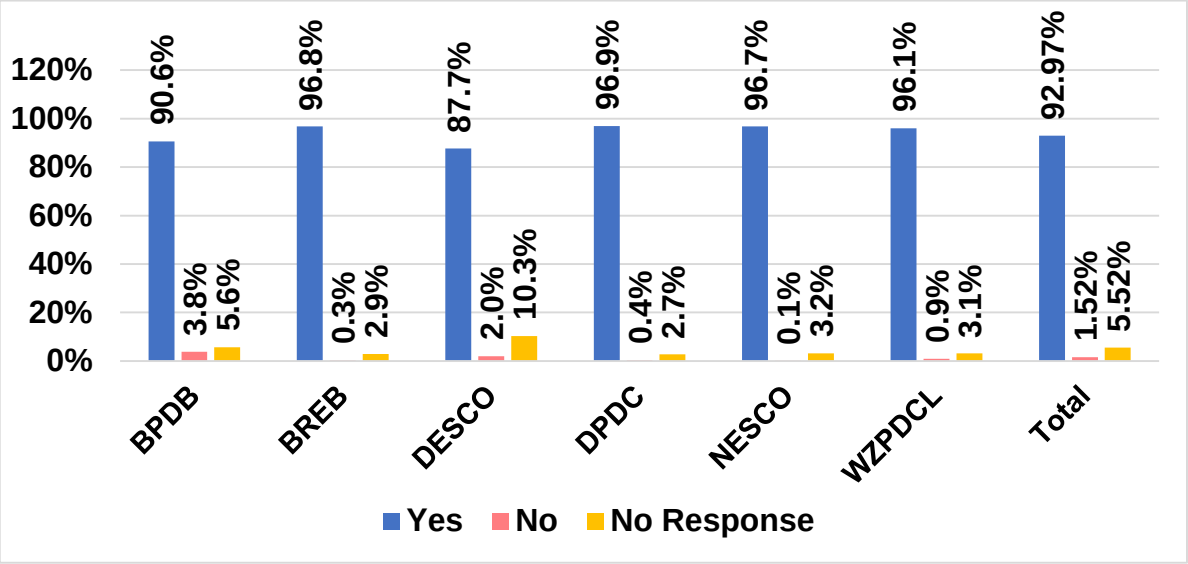


FIGURE-38: STATUS OF RECEIVED SERVICE WITHIN THE DESIRED TIME (UTILITY WISE) (%)



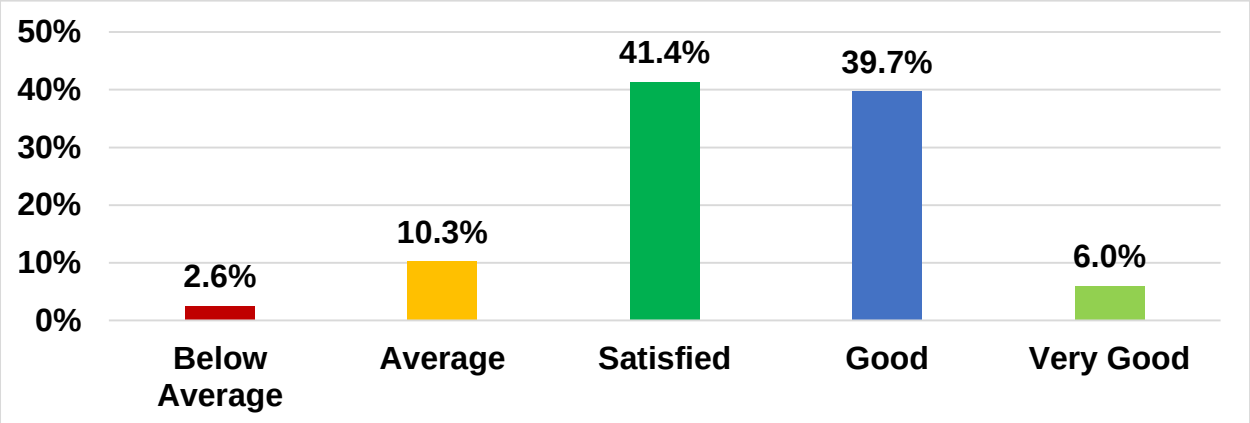
4.1.7.5 Status of the quality of received services

The maximum number of customers (41.40%) stated that they are 'Satisfied' with the quality of the received services, while 39.72% of the customers mentioned it as 'good', followed by 10.28% (Average), 6% (Very Good) and only 2.59% mentioned it as 'Below Average'. This means that 87.13% of the customers are satisfied at different levels. It is coming-out from the analysis that the quality of services, which is rendered by the six utilities, at present, it needs to be improved following the expectation of the customers. Details are shown below **(Table-39 and Figure-39):**

TABLE-39: STATUS OF THE QUALITY OF RECEIVED SERVICES

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Below Average	118	0.83	19	0.13	131	0.92	38	0.27	6	0.04	55	0.39	367	2.59
Average	439	3.10	214	1.51	289	2.04	146	1.03	16	0.11	353	2.49	1457	10.28
Satisfied	909	6.41	1233	8.70	1381	9.74	1077	7.60	253	1.79	1015	7.16	5868	41.40
Good	1030	7.27	625	4.41	1637	11.55	756	5.33	817	5.76	765	5.40	5630	39.72
Very Good	103	0.73	92	0.65	317	2.24	101	0.71	187	1.32	51	0.36	851	6.00
Total	**2599**	**18.34**	**2183**	**15.40**	**3755**	**26.49**	**2118**	**14.94**	**1279**	**9.02**	**2239**	**15.80**	**14173**	**100**

FIGURE-39: STATUS OF THE QUALITY OF RECEIVED SERVICES (%)



4.1.7.6 Status of attention paid by the Call Centre/Hotlines recipient against the lodged complaints

The majority of the customers (89.01%) stated 'Yes', they paid full attention to our lodged complaints, while 6.51% stated as 'No Response' and only 4.48% stated 'No', they didn't pay their full attention to our lodged complaints. It is coming-out from the analysis that customers are highly pleased with the service of call centre. But six utilities need to pay their attention to improve the situation furthermore. Details are provided below **(Table-40 and Figure-40)**:

TABLE-40: STATUS OF ATTENTION PAID BY THE CALL CENTRE/HOTLINE'S RECIPIENT AGAINST THE LODGED COMPLAINTS

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	2442	16.02	2085	13.68	3607	23.66	2070	13.58	1270	8.33	2096	13.75	13570	89.01
No	261	1.71	94	0.62	163	1.07	42	0.28	8	0.05	115	0.75	683	4.48
No Response	165	1.08	77	0.51	512	3.36	74	0.49	44	0.29	120	0.79	992	6.51
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-40 (a): STATUS OF ATTENTION PAID BY THE CALL CENTRE/HOTLINE'S RECIPIENT AGAINST THE LODGED COMPLAINTS (%)

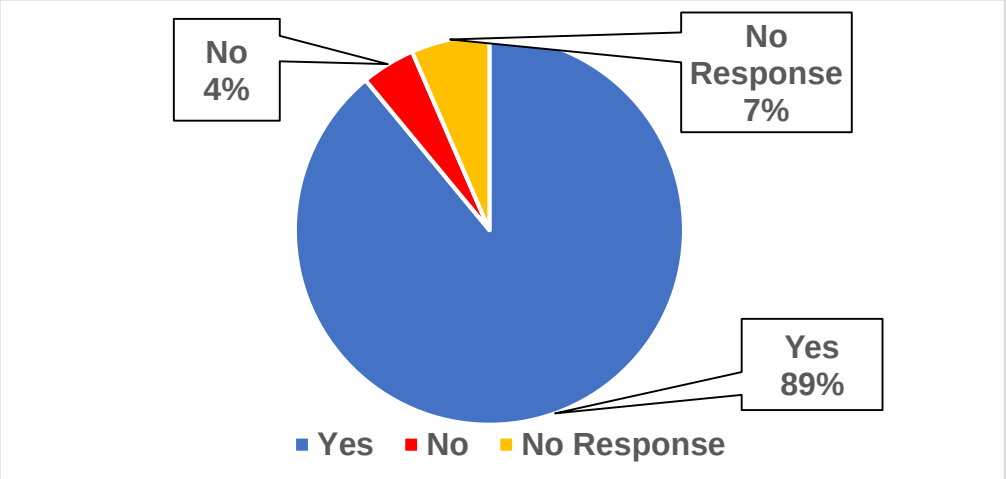
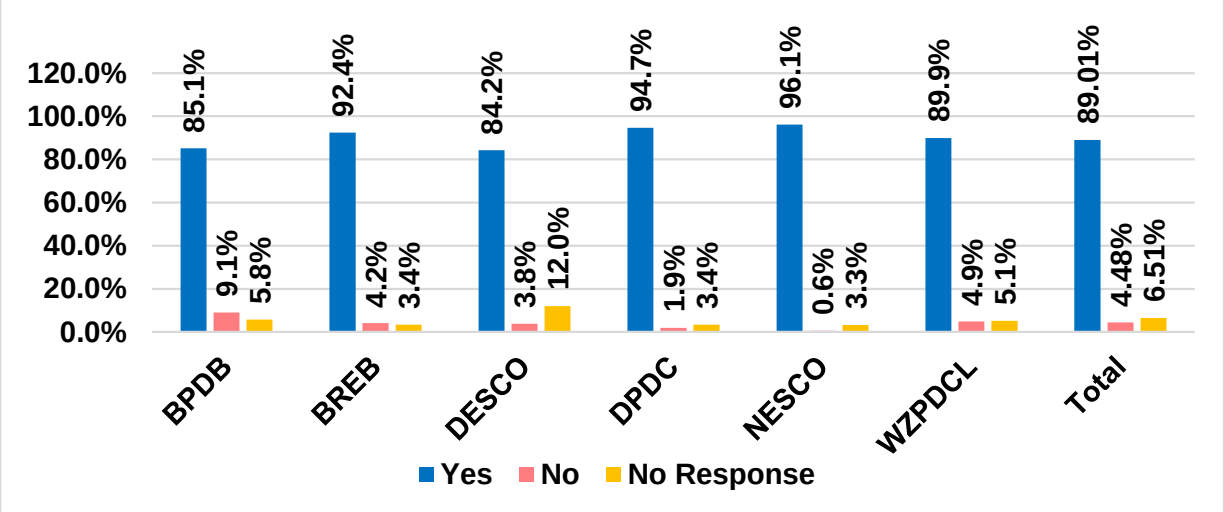


FIGURE-40 (b): STATUS OF ATTENTION PAID BY THE CENTRE/HOTLINE'S RECIPIENT AGAINST THE LODGED COMPLAINTS (%)



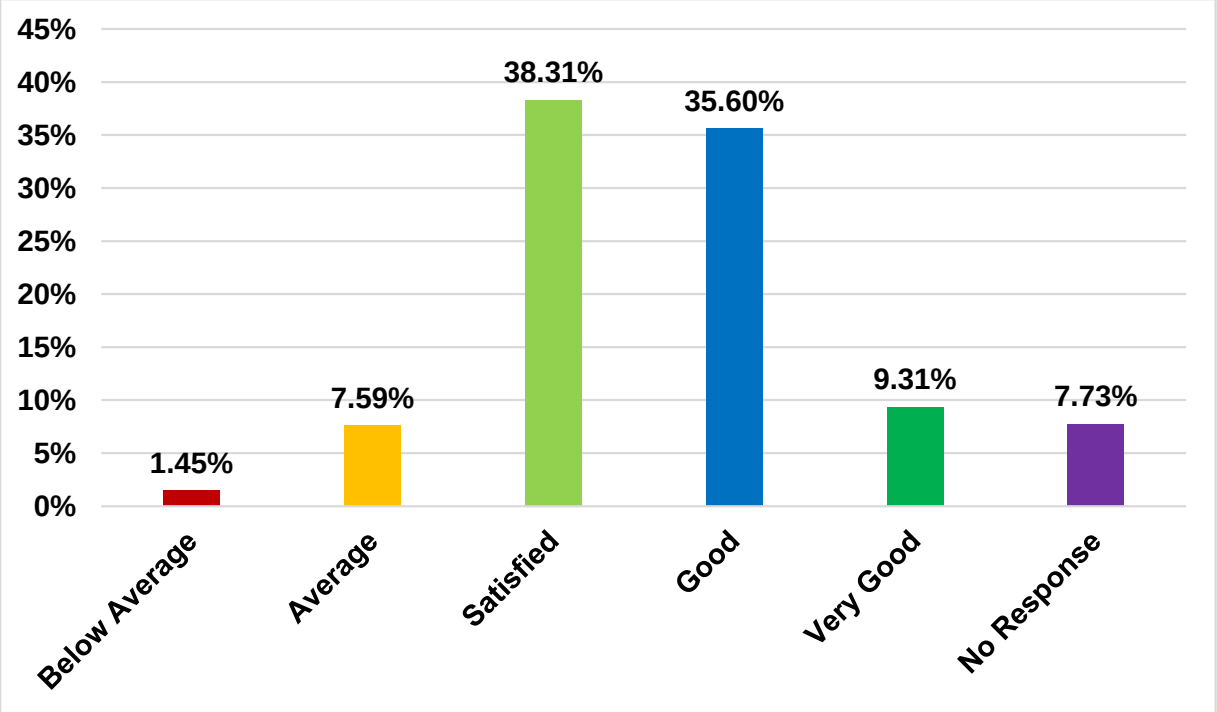
4.1.7.7 Status of the quality of attention paid by the call centre's recipient against the lodged complaints

The majority of the customers (38.31%) mentioned that they are 'Satisfied' with the quality of attention paid by the call centre's recipient against the lodged complaints, while 35.60% mentioned that the quality of attention is 'Good', followed by 9.31% (Very Good), 7.73% (No Response), 7.59% (Average) and only 1.45% mentioned that the quality of service is 'Below Average'. This means that 83.23% of the customers are satisfied at different levels. The analysis says that, there is a big room for improving the quality of attention paid by the call centre's recipient against the lodged complaints. For this purpose, six utilities could arrange training on 'How to handle a customer in a better way' for the recipient of the call centre. Details are depicted below **(Table-41 and Figure-41):**

TABLE-41: STATUS OF THE QUALITY OF ATTENTION PAID BY THE CALL CENTRE'S RECIPIENT AGAINST THE LODGED COMPLAINTS

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Below Average	90	0.59	14	0.09	66	0.43	26	0.17	1	0.01	24	0.16	221	1.45
Average	309	2.03	205	1.34	171	1.12	157	1.03	38	0.25	277	1.82	1157	7.59
Satisfied	926	6.07	1207	7.92	1330	8.72	1091	7.16	151	0.99	1136	7.45	5841	38.31
Good	994	6.52	582	3.82	1677	11.00	759	4.98	728	4.78	687	4.51	5427	35.60
Very Good	279	1.83	176	1.15	432	2.83	84	0.55	360	2.36	89	0.58	1420	9.31
No Response	270	1.77	72	0.47	606	3.98	69	0.45	44	0.29	118	0.77	1179	7.73
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-41: STATUS OF THE QUALITY OF ATTENTION PAID BY THE CALL CENTRE'S RECIPIENT AGAINST THE LODGED COMPLAINTS (%)



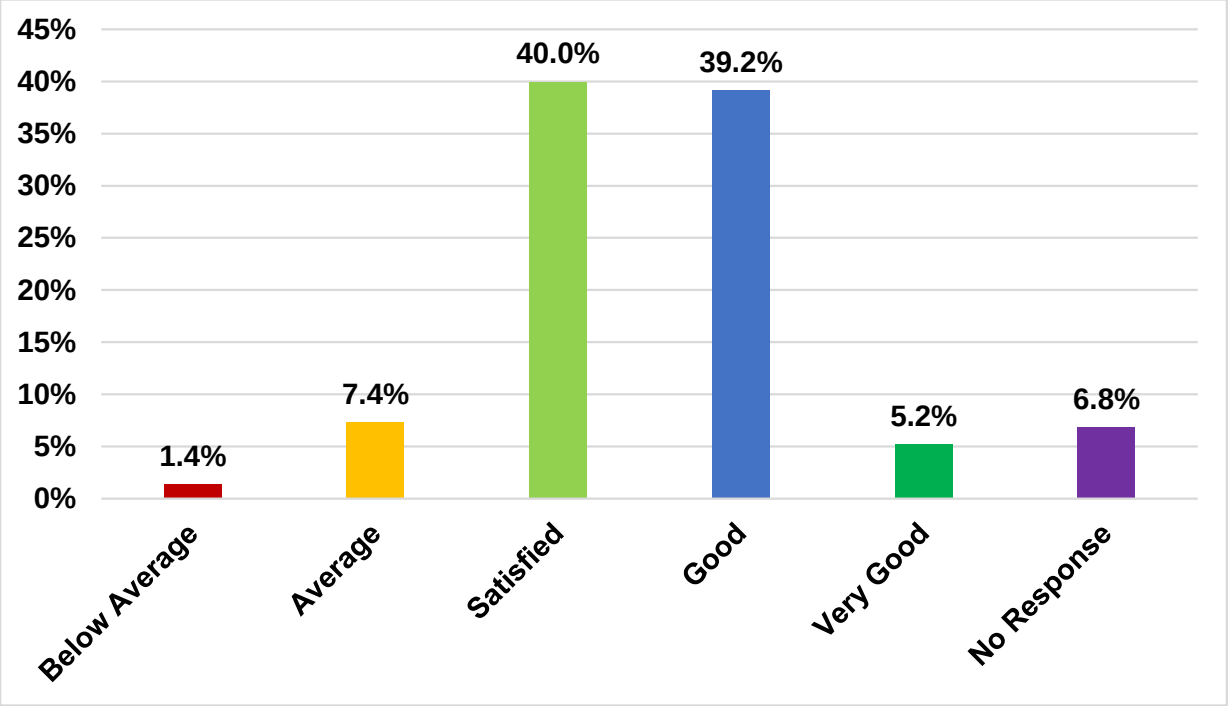
4.1.7.8 Quality of Solution provided by the Power Distribution Organizations / Companies against the Lodged Complaints

The majority of the customers (39.99%) mentioned that they are 'Satisfied' with the Quality of Solution provided by the Power Distribution Organizations/ Companies against the Lodged Complaints, while 39.20% mentioned that the quality of solution provided is 'Good', followed by 7.35% (Average), 6.83% (No Response), 5.21% (Very Good) and only 1.41% mentioned that the solution provided is 'Below Average'. This means that 84.41% of the customers are satisfied at different levels. The analysis says that, still there is a space for improving the quality of provided solution by the Power Distribution Organizations/ Companies against the Lodged Complaints. To achieve this target, six utilities could arrange special training on 'How to formulate quality solution against the lodged complaints' for the concern officials of the power distribution Organizations/ Companies. Details are depicted below **(Table-42 and Figure-42)**:

TABLE-42: QUALITY OF SOLUTION PROVIDED BY THE POWER DISTRIBUTION ORGANIZATIONS/ COMPANIES AGAINST THE LODGED COMPLAINTS

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Below Average	69	0.45	10	0.07	69	0.45	20	0.13	2	0.01	45	0.30	215	1.41
Average	339	2.22	170	1.12	203	1.33	112	0.73	5	0.03	292	1.92	1121	7.35
Satisfied	1026	6.73	1288	8.45	1377	9.03	1082	7.10	201	1.32	1123	7.37	6097	39.99
Good	1061	6.96	666	4.37	1819	11.93	795	5.21	901	5.91	734	4.81	5976	39.20
Very Good	118	0.77	56	0.37	265	1.74	116	0.76	173	1.13	67	0.44	795	5.21
No Response	255	1.67	66	0.43	549	3.60	61	0.40	40	0.26	70	0.46	1041	6.83
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-42: QUALITY OF SOLUTION PROVIDED BY THE POWER DISTRIBUTION ORGANIZATIONS/ COMPANIES AGAINST THE LODGED COMPLAINTS (%)



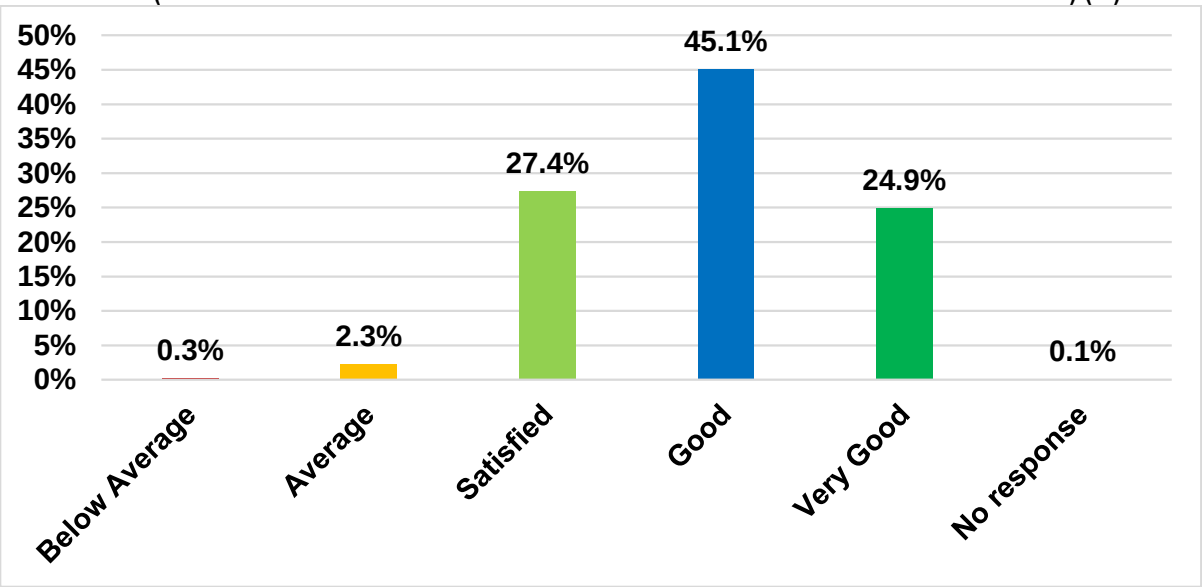
4.1.7.9 Level of satisfaction after obtaining the quality power compared to the past (In the context of Correct Voltage/ Uninterrupted Power Supply)

Customers are expressed their opinion spontaneously regarding the level of satisfaction after obtaining the quality power compared to the past (In the context of Correct Voltage/ Uninterrupted Power Supply). The majority of the customers (45.06%) mentioned their level of satisfaction as 'Good', while the 27.38% mentioned that the same as 'Satisfied', followed by 24.91% (Very Good), 2.26% (Average), 0.28% (Below Average) and only 0.10% stated as 'No response'. The analysis portrayed a very positive picture of the present situation of quality power supply compare to the past considering the positive response of the customers based on their inner mind's satisfaction level. If we add three prominent satisfaction levels ('Very Good' + 'Good' + 'Satisfied') together, the satisfaction level stands to **97.35%** out of 100% (i.e., 24.91%+45.06%+27.38%), which is the furthest better than past. We think, six utilities need to maintain this level of satisfaction by dint of their matured technical skill and knowledge. This will create a healthy and sound environment in the power sector. Details are furnished below **(Table-43 and Figure-43):**

TABLE-43: LEVEL OF SATISFACTION AFTER OBTAINING THE QUALITY POWER COMPARED TO THE PAST (IN THE CONTEXT OF CORRECT VOLTAGE/ UNINTERRUPTED POWER SUPPLY)

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Below Average	26	0.17	1	0.01	12	0.08	4	0.03	0	0	0	0	43	0.28
Average	158	1.04	60	0.39	75	0.49	22	0.14	2	0.01	27	0.18	344	2.26
Satisfied	722	4.74	950	6.23	917	6.02	780	5.12	130	0.85	675	4.43	4174	27.38
Good	1242	8.15	962	6.31	1879	12.33	983	6.45	671	4.40	1133	7.43	6870	45.06
Very Good	717	4.70	282	1.85	1392	9.13	395	2.59	518	3.40	494	3.24	3798	24.91
No response	3	0.02	1	0.01	7	0.05	2	0.01	1	0.01	2	0.01	16	0.10
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-43: LEVEL OF SATISFACTION AFTER OBTAINING THE QUALITY POWER COMPARED TO THE PAST (IN THE CONTEXT OF CORRECT VOLTAGE/ UNINTERRUPTED POWER SUPPLY) (%)



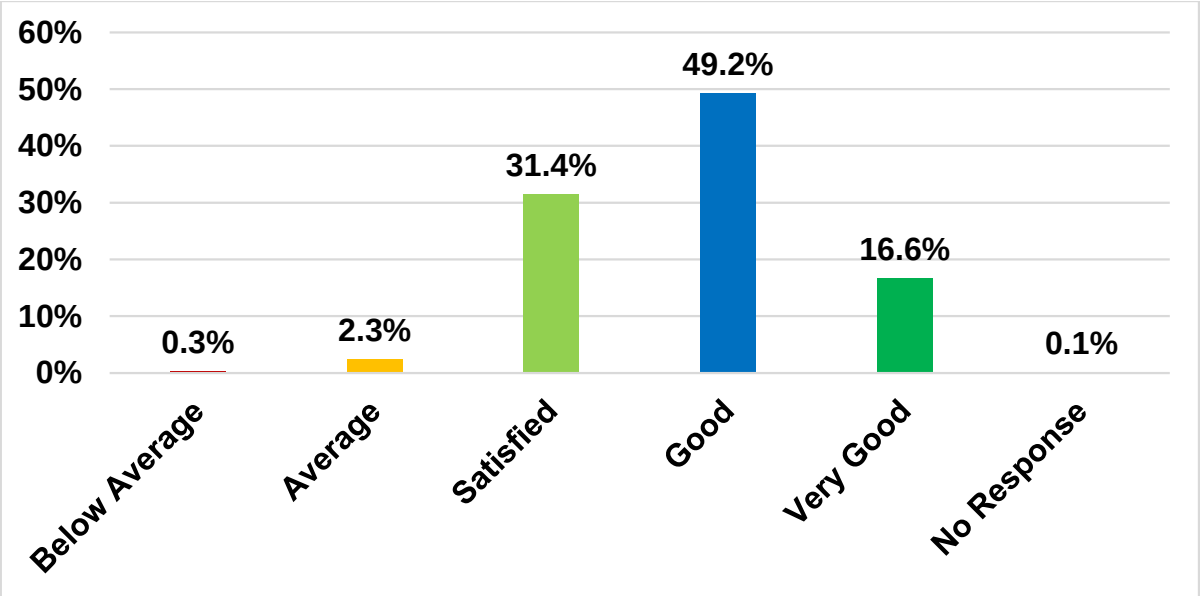
4.1.7.10 Level of satisfaction against the current improvement of the power distribution system

Customers expressed their opinion judiciously considering their personal experience and judgement regarding the level of satisfaction against the current improvement of the power distribution system. The majority of the customers (49.22%) considered their level of satisfaction as 'Good', while the 31.42% considered that the same as 'Satisfied', followed by 16.62% (Very Good), 2.34% (Average), 0.30% (Below Average) and only 0.10% considered as 'No response'. The analysis drawn a very impressive image of the current improvement of the power distribution system. If we would like to understand the total scenario of the current improvement of the power distribution system in that case, we need to add three prominent satisfaction levels ('Very Good' + 'Good' + 'Satisfied') together, the satisfaction level stands to **97.26%** out of 100% (i.e., 16.62%+49.22%+31.42%), which is the furthest better than past. We think, six utilities need to maintain this level of satisfaction in lieu of their acquired technical skill and knowledge. This will create a healthy and sound environment in the power sector. Details are furnished below **(Table-44 and Figure-44):**

TABLE-44: LEVEL OF SATISFACTION AGAINST THE CURRENT IMPROVEMENT OF THE POWER DISTRIBUTION SYSTEM

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Below Average	25	0.16	2	0.01	10	0.07	2	0.01	1	0.01	5	0.03	45	0.30
Average	147	0.96	82	0.54	63	0.41	36	0.24	2	0.01	26	0.17	356	2.34
Satisfied	729	4.78	1006	6.60	1223	8.02	893	5.86	96	0.63	843	5.53	4790	31.42
Good	1582	10.38	914	6.00	2286	15.00	997	6.54	549	3.60	1176	7.71	7504	49.22
Very Good	383	2.51	250	1.64	695	4.56	254	1.67	673	4.41	279	1.83	2534	16.62
No Response	2	0.01	2	0.01	5	0.03	4	0.03	1	0.01	2	0.01	16	0.10
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-44: LEVEL OF SATISFACTION AGAINST THE CURRENT IMPROVEMENT OF THE POWER DISTRIBUTION SYSTEM (%)



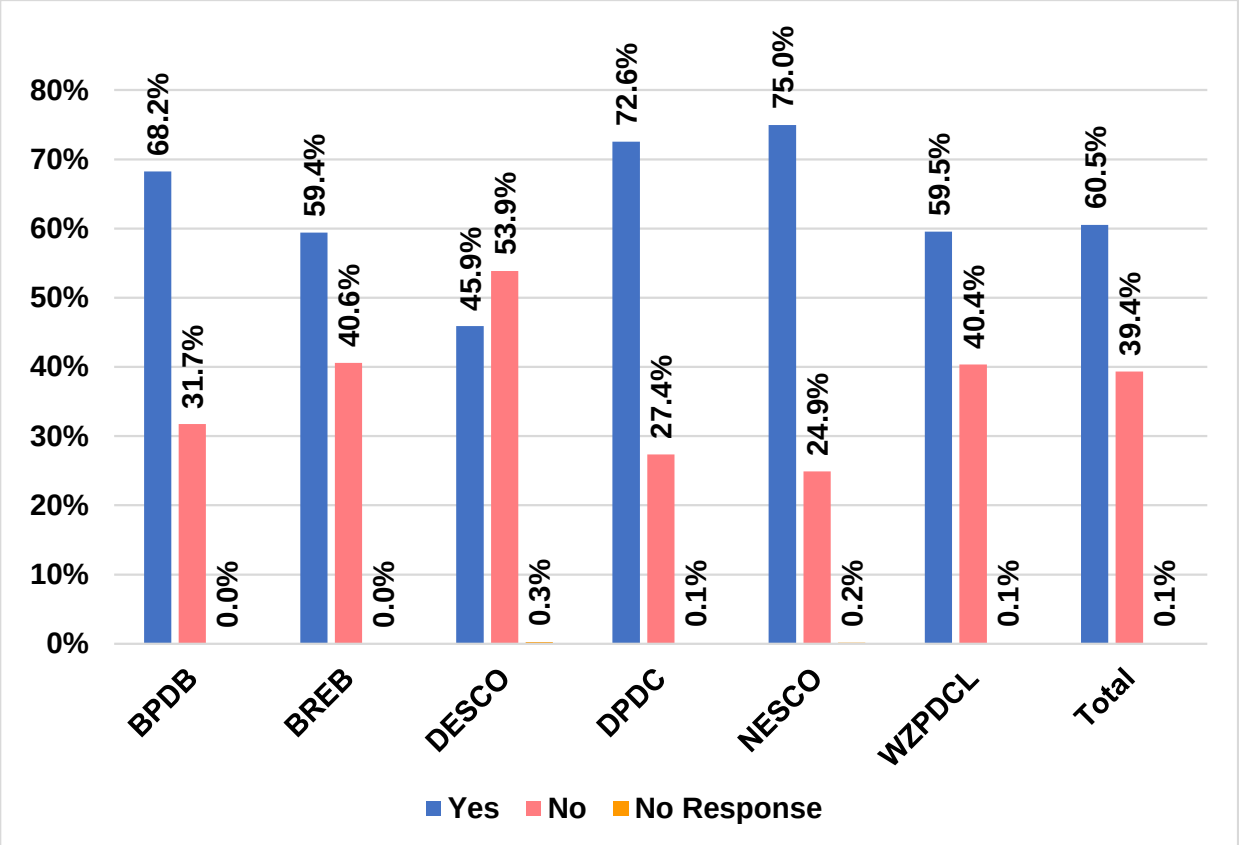
4.1.7.11 Status of the customer's specific complaints about the electricity distribution Organizations/ Companies

The majority of the customers (60.52%) stated 'Yes', they have a specific complaint about the electricity distribution Organizations/ Companies, while 39.35% stated that as 'No' and only 0.12% stated as 'No Response'. It is coming-out from the analysis that the customers have some disappointments towards the electricity distribution Organizations/ Companies because of specific complaints. Six utilities need to try to remove these disappointments by dint of their best work and strong customer's relationship. Six utilities may arrange monthly meetings with their customers to exchange of their views and specifically identify the grey area of the customer's mind, which will ultimately help to build a strong relationship with the customers. Details are provided below **(Table-45 and Figure-45):**

TABLE-45: STATUS OF THE CUSTOMER'S SPECIFIC COMPLAINTS ABOUT THE ELECTRICITY DISTRIBUTION ORGANIZATIONS/ COMPANIES

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	1957	12.84	1340	8.79	1965	12.89	1586	10.40	991	6.50	1388	9.10	9227	60.52
No	910	5.97	915	6.00	2306	15.13	598	3.92	329	2.16	941	6.17	5999	39.35
No Response	1	0.01	1	0.01	11	0.07	2	0.01	2	0.01	2	0.01	19	0.12
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-45: STATUS OF THE CUSTOMER'S SPECIFIC COMPLAINTS ABOUT THE ELECTRICITY DISTRIBUTION ORGANIZATIONS/ COMPANIES (%)



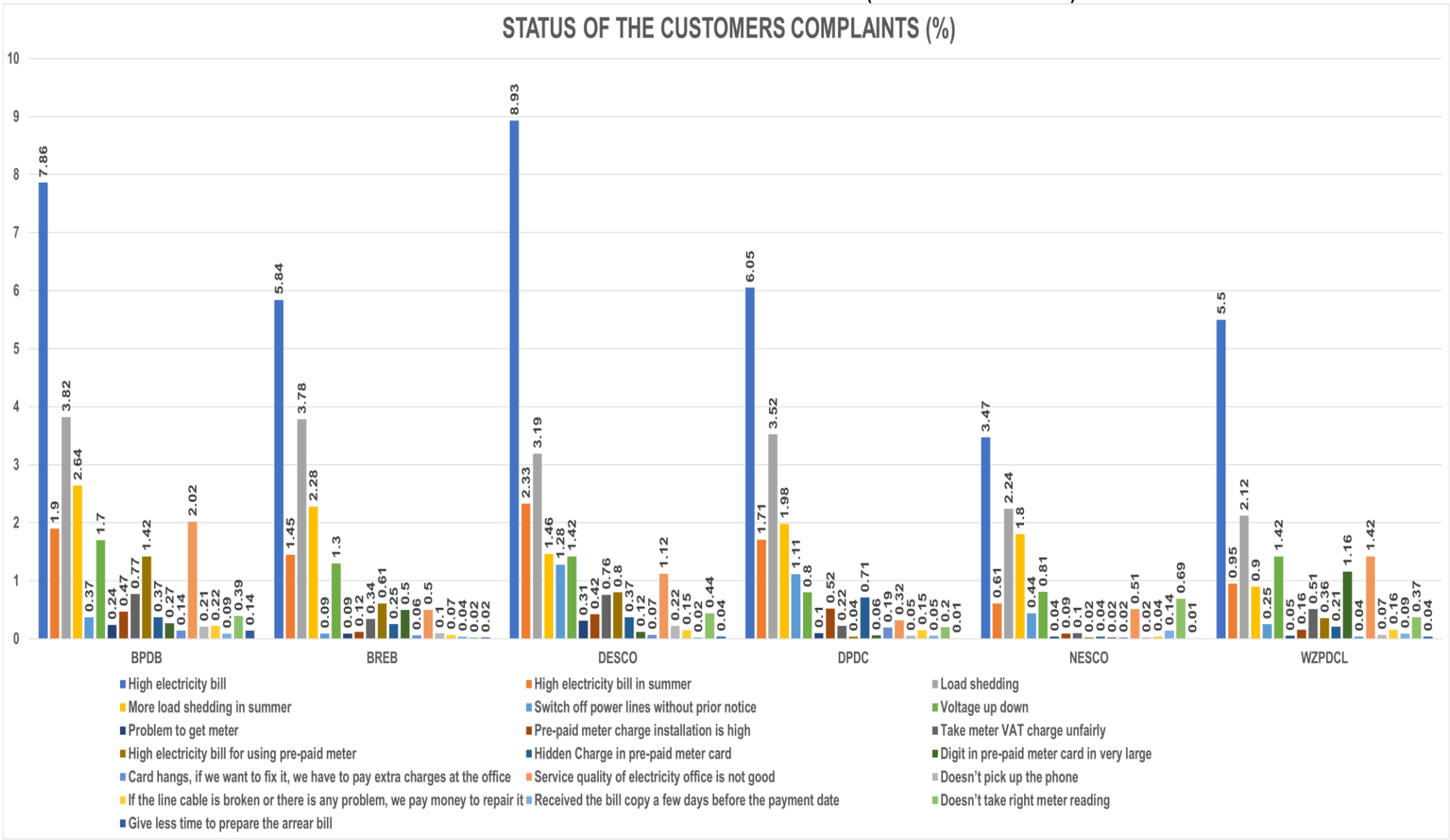
4.1.7.12 Status of the Customers Complaints (Multiple Response)

Among the total customer's complaints, which are needed immediate attention of 6 utilities to resolve these complaints amicably to uphold the satisfaction level of their customers. Amongst of them, 37.64% customers focussed their complaints as 'High electricity bill', while 18.67% raised as 'Load shedding'. Other customers lodged their complaint as follows -11.06% (More load shedding in summer), 8.94% (High electricity bill in summer), 7.45% (Voltage up down), 5.90% (Service quality of electricity office is not good), 3.54% (Switch off power lines without prior notice), 3.26% (High electricity bill for using pre-paid meter), 2.71% (Take meter VAT charge unfairly), 2.15% (Digit in pre-paid meter card in very large), 2.11% (Doesn't take right meter reading), 1.96% (Hidden Charge in pre-paid meter card), 1.80% (Pre-paid meter charge installation is high); 0.82% (Problem to get meter), 0.80% (If the line cable is broken or there is any problem, we pay money to repair it), 0.69% (doesn't pick up the phone), 0.52% (Card hangs, if we want to fix it, we have to pay extra charges at the office), 0.42% (Received the bill copy a few days before the payment date) and only 0.26% mentioned as 'Give less time to pay the arrear bill'. The analysis depicted the untold voice of the customers and raised all their valid complaints. Six utilities need to prepare a pragmatic action plan to ensure not to return back all the raised complaints. The details are portrayed below **(Table-46 and Figure-46):**

TABLE-46: STATUS OF THE CUSTOMERS COMPLAINTS (MULTIPLE RESPONSE)

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
High electricity bill	630	7.86	468	5.84	716	8.93	485	6.05	278	3.47	441	5.50	3018	**37.64**
High electricity bill in summer	152	1.90	116	1.45	187	2.33	137	1.71	49	0.61	76	0.95	717	8.94
Load shedding	306	3.82	303	3.78	256	3.19	282	3.52	180	2.24	170	2.12	1497	18.67
More load shedding in summer	212	2.64	183	2.28	117	1.46	159	1.98	144	1.80	72	0.90	887	11.06
Switch off power lines without prior notice	30	0.37	7	0.09	103	1.28	89	1.11	35	0.44	20	0.25	284	3.54
Voltage up down	136	1.70	104	1.30	114	1.42	64	0.80	65	0.81	114	1.42	597	7.45
Problem to get meter	19	0.24	7	0.09	25	0.31	8	0.10	3	0.04	4	0.05	66	0.82
Pre-paid meter charge installation is high	38	0.47	10	0.12	34	0.42	42	0.52	7	0.09	13	0.16	144	1.80
Take meter VAT charge unfairly	62	0.77	27	0.34	61	0.76	18	0.22	8	0.10	41	0.51	217	2.71
High electricity bill for using pre-paid meter	114	1.42	49	0.61	64	0.80	3	0.04	2	0.02	29	0.36	261	3.26
Hidden Charge in pre-paid meter card	30	0.37	20	0.25	30	0.37	57	0.71	3	0.04	17	0.21	157	1.96
Digit in pre-paid meter card in very large	22	0.27	40	0.50	10	0.12	5	0.06	2	0.02	93	1.16	172	2.15
Card hangs, if we want to fix it, we have to pay extra charges at the office	11	0.14	5	0.06	6	0.07	15	0.19	2	0.02	3	0.04	42	0.52
Service quality of electricity office is not good	162	2.02	40	0.50	90	1.12	26	0.32	41	0.51	114	1.42	473	5.90
Doesn't pick up the phone	17	0.21	8	0.10	18	0.22	4	0.05	2	0.02	6	0.07	55	0.69
If the line cable is broken or there is any problem, we pay money to repair it	18	0.22	6	0.07	12	0.15	12	0.15	3	0.04	13	0.16	64	0.80
Received the bill copy a few days before the payment date	7	0.09	3	0.04	2	0.02	4	0.05	11	0.14	7	0.09	34	0.42
Doesn't take right meter reading	31	0.39	2	0.02	35	0.44	16	0.20	55	0.69	30	0.37	169	2.11
Give less time to prepare the arrear bill	11	0.14	2	0.02	3	0.04	1	0.01	1	0.01	3	0.04	21	0.26

FIGURE-46: STATUS OF THE CUSTOMERS COMPLAINTS (MULTIPLE RESPONSE)



4.1.8 Questionnaire Regarding Communication

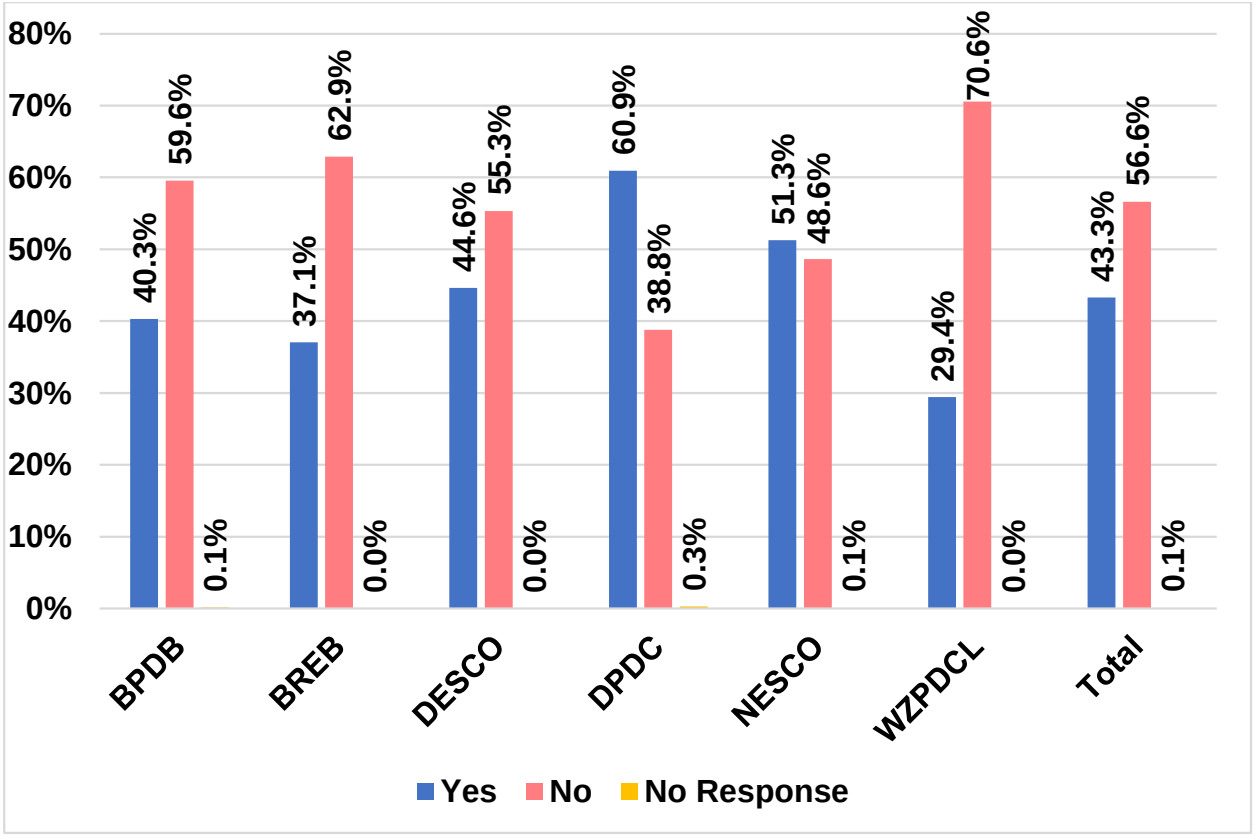
4.1.8.1 Status of the Customers Awareness about the 'Concerned authorities are always aware' to ensure the best customer service

The customers of six utilities expressed their opinion spontaneously about the 'Concerned authorities are always aware' to ensure the best customer services without any hesitation. The majority of the customers (56.62%) said 'No', they don't know about the slogan 'Concerned authorities are always aware' to ensure the best customer service, while 43.29% stated the same as 'Yes' and only 0.09% stated as 'No Response'. It is coming-out from the analysis that the awareness campaign of six utilities is not working well. Hence, six utilities need to revisit their awareness campaign plan to make it more effective so that, each and every customer is under their jurisdiction aware about their slogan and their rendering services. Details are provided below **(Table-47 and Figure-47):**

TABLE-47: STATUS OF THE CUSTOMERS AWARENESS ABOUT THE 'CONCERNED AUTHORITIES ARE ALWAYS AWARE' TO ENSURE THE BEST CUSTOMER SERVICE

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	1156	7.58	836	5.48	1911	12.54	1332	8.74	678	4.45	686	4.50	6599	43.29
No	1708	11.20	1419	9.31	2369	15.54	848	5.56	643	4.22	1645	10.79	8632	56.62
No Response	4	0.03	1	0.01	2	0.01	6	0.04	1	0.01	0	0	14	0.09
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-47: STATUS OF THE CUSTOMERS AWARENESS ABOUT THE 'CONCERNED AUTHORITIES ARE ALWAYS AWARE' TO ENSURE THE BEST CUSTOMER SERVICE (%)



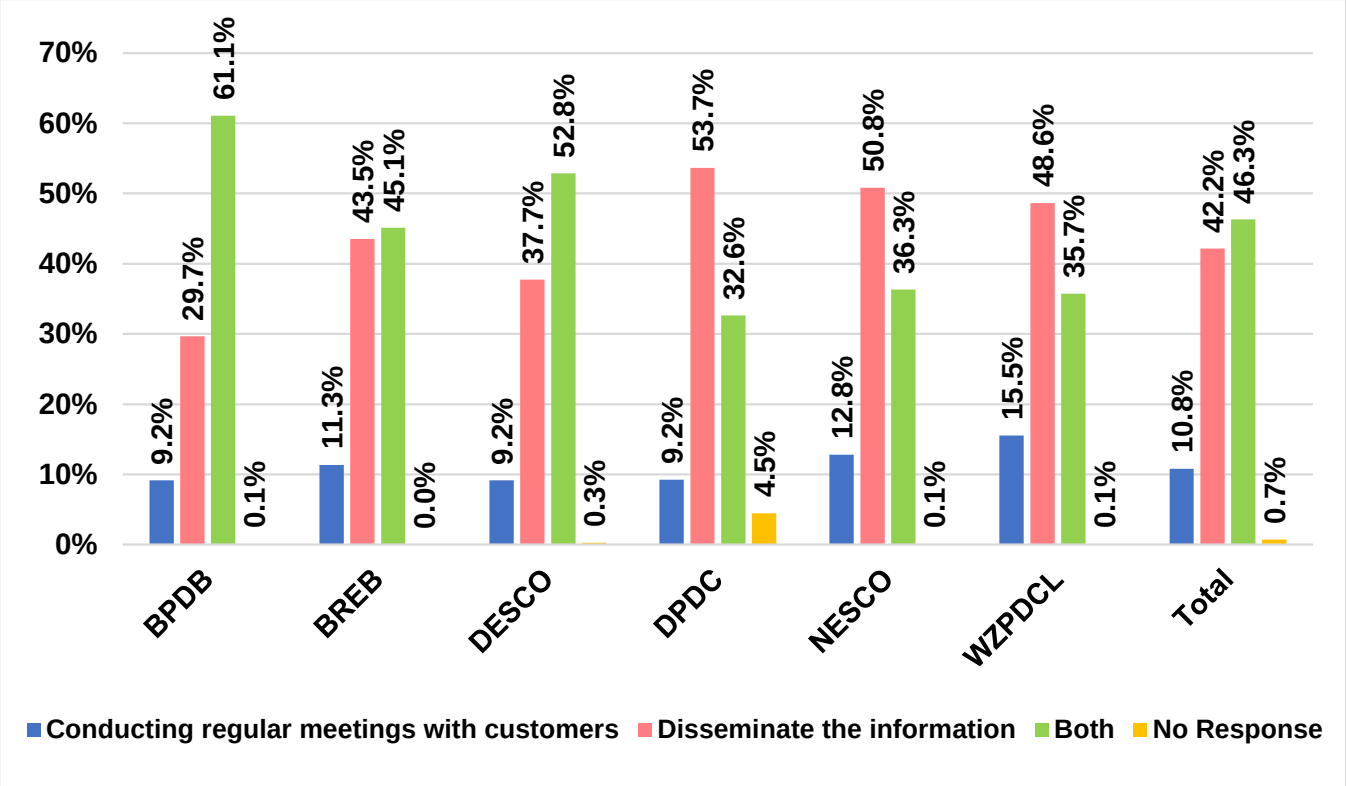
4.1.8.2 The best way to communicate to the valued customer

The majority of the valued customers after considering their practical experience and knowledge expressed their views regarding the best way to communicate to them without any hesitation. 46.30% of the valued customers stated their views as 'Both', while 42.16% of the valued customers focused on 'Disseminate the information' followed by 10.78% (Conducting regular meetings with customers) and only 0.75% of the customers stated as 'No Response'. Six utilities may take their communicating decision with their customers based on the survey findings. As all over the globe choosing communication tools is an important factor. Hence, six utilities may choose their communication tools after critically assessing the effectiveness of their currently utilizing communication tools. Details are furnished below (**Table-48 and Figure-48):**

TABLE-48: THE BEST WAY TO COMMUNICATE TO THE VALUED CUSTOMER

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Conducting regular meetings with customers	263	1.73	256	1.68	392	2.57	202	1.33	169	1.11	362	2.37	1644	10.78
Disseminate the information	851	5.58	982	6.44	1616	10.60	1173	7.69	672	4.41	1134	7.44	6428	42.16
Both	1752	11.49	1018	6.68	2263	14.84	713	4.68	480	3.15	833	5.46	7059	46.30
No Response	2	0.01	0	0	11	0.07	98	0.64	1	0.01	2	0.01	114	0.75
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-48: THE BEST WAY TO COMMUNICATE TO THE VALUED CUSTOMER (%)



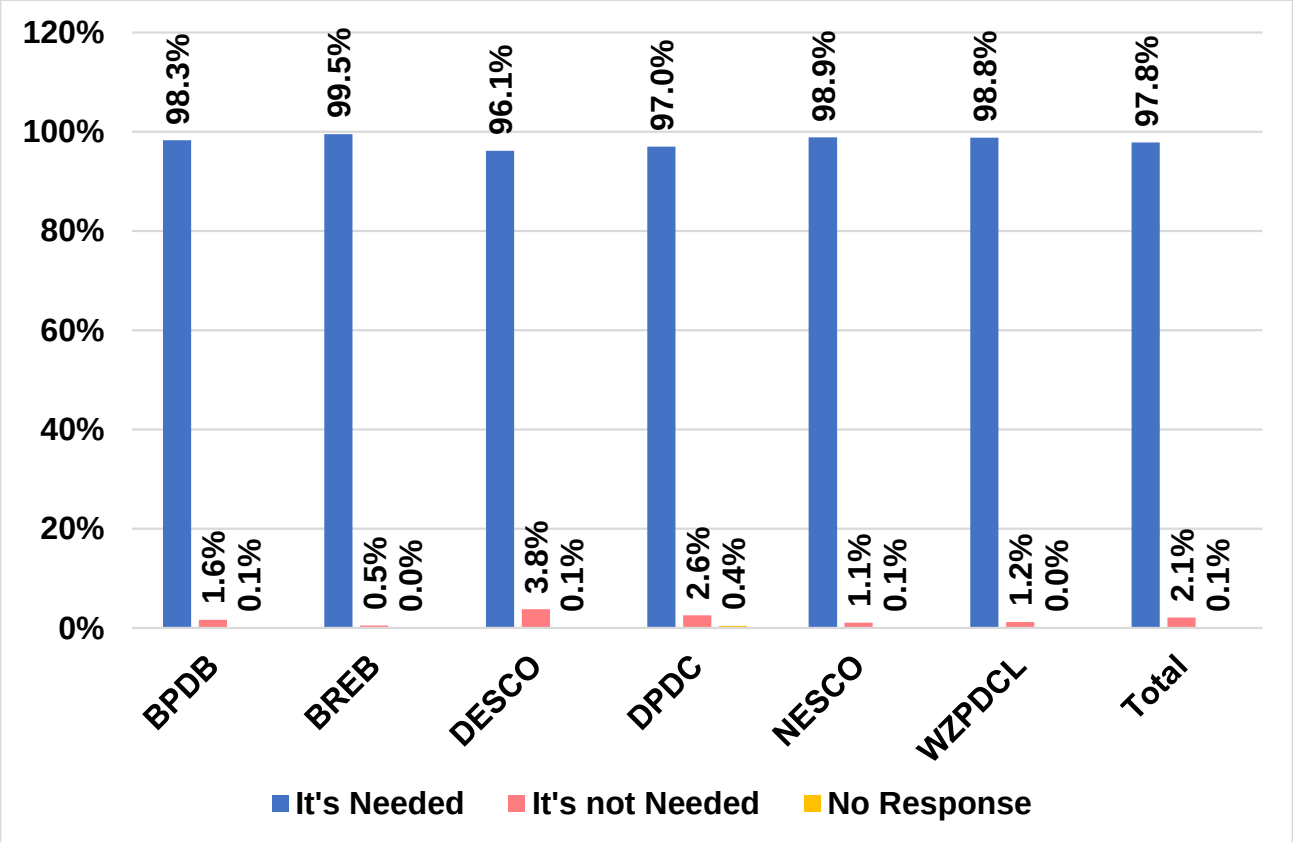
4.1.8.3 Opinion regarding the need of publicity for improving the public awareness regarding electricity usage and bill payment

The customers of six utilities expressed their opinion spontaneously about the need of publicity for improving the public awareness regarding electricity usage and bill payment without any hesitation. The majority of the customers (97.81%) stated as 'Its Needed', publicity is very important to improve the public awareness regarding electricity usage and bill payment, while 2.09% stated the same as 'It's not Needed' and only 0.10% stated as 'No Response'. It is reviled from the analysis that the eye-catchy and modern publicity is required for creating mass awareness about the electricity usage and bill payment. Hence, six utilities need to reshape their publicity activities to make it smarter and 100% publicly acceptable, which will ultimately bring visible improvement in their publicity activities. Details are provided below **(Table-49 and Figure-49):**

TABLE-49: OPINION REGARDING THE NEED OF PUBLICITY FOR IMPROVING THE PUBLIC AWARENESS REGARDING ELECTRICITY USAGE AND BILL PAYMENT

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
It's Needed	2818	18.48	2245	14.73	4117	27.01	2121	13.91	1307	8.57	2303	15.11	14911	97.81
It's not Needed	47	0.31	11	0.07	162	1.06	56	0.37	14	0.09	28	0.18	318	2.09
No Response	3	0.02	0	0.00	3	0.02	9	0.06	1	0.01	0	0	16	0.10
Total	**2868**	**18.81**	**2256**	**14.80**	**4282**	**28.09**	**2186**	**14.34**	**1322**	**8.67**	**2331**	**15.29**	**15245**	**100**

FIGURE-49: OPINION REGARDING THE NEED OF PUBLICITY FOR IMPROVING THE PUBLIC AWARENESS REGARDING ELECTRICITY USAGE AND BILL PAYMENT (%)



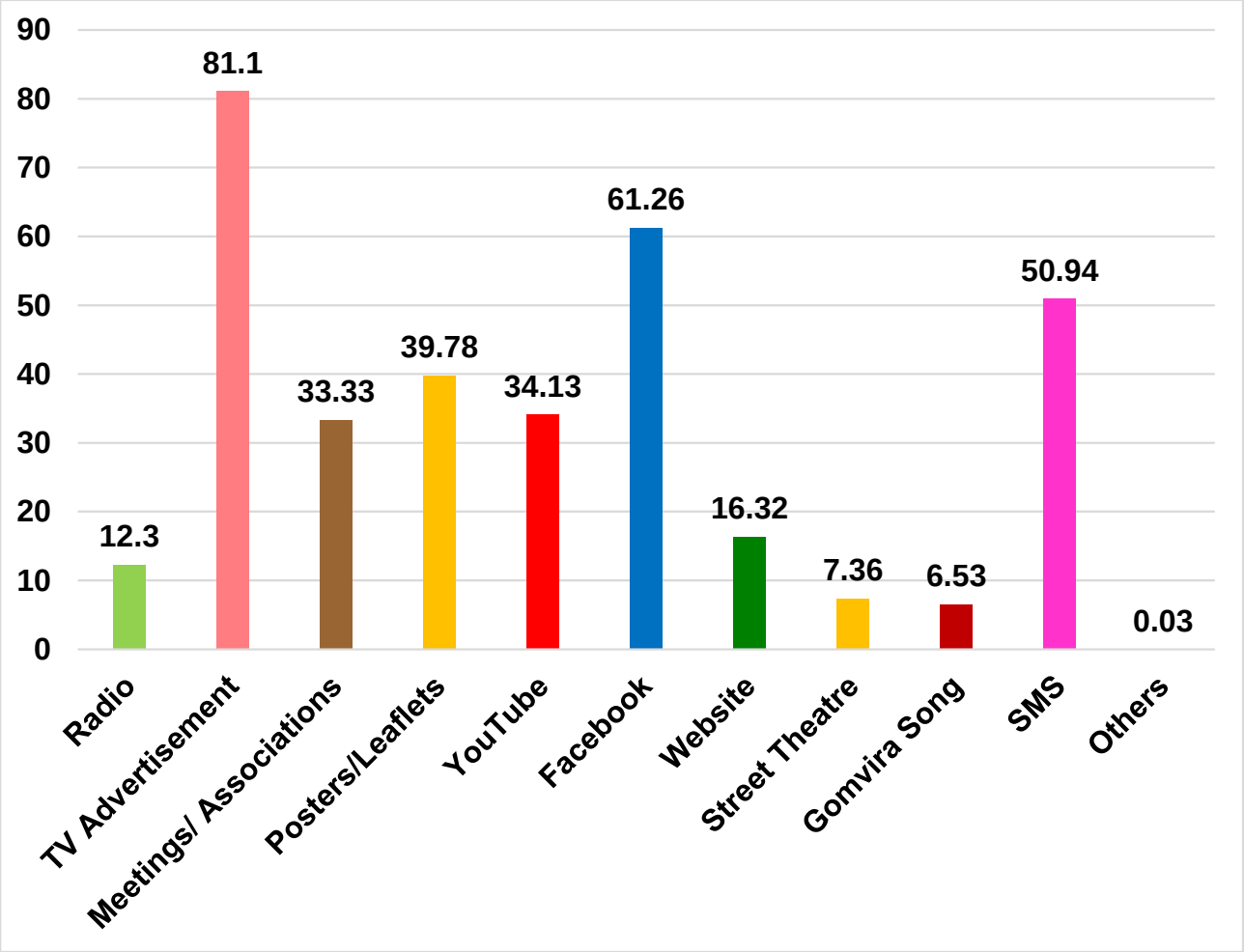
4.1.8.4 Effective media for campaigning (Multiple Response)

For promoting or advertising any campaigning/matter/message/slogan/information, choosing an effective medium is an important work all over the globe. After thinking about the total subject, the respondents have provided their judicious opinions without any hesitation. The majority of the respondents (81.10%) considered TV Advertisement as the effecting media, while 61.26% considered Facebook as the effective media. Rest of the respondents considered the following as the effective medias for campaigning - SMS (50.94%), Posters/Leaflets (39.78%), YouTube (34.13%), Meetings/ Associations (33.33%), Website (16.32%), Radio (12.30%), Street Theatre (7.36%), Gomvira Song (6.53%), and Others (0.03%). The authority of the six utilities may select anyone of the media as an effective media for their campaigning work considering the media ranking, cost and effectiveness. When they take decision for choosing any media, they must keep in their mind that the people's mind is changing frequently all over the globe. Hence, they may also alter their previous choice considering the people's demand and increasing cost of the media. Details are depicted below **(Table-50 and Figure-50):**

TABLE-50: EFFECTIVE MEDIA FOR CAMPAIGNING (MULTIPLE RESPONSE)

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Radio	412	2.72	370	2.44	451	2.98	213	1.41	73	0.48	343	2.27	1862	12.30
TV Advertisement	2343	15.47	1972	13.02	3174	20.96	1854	12.24	915	6.04	2023	13.36	12281	81.10
Meetings/ Associations	1028	6.79	948	6.26	1168	7.71	674	4.45	296	1.95	933	6.16	5047	33.33
Posters/Leaflets	1242	8.20	808	5.34	1514	10.00	952	6.29	618	4.08	890	5.88	6024	39.78
YouTube	1161	7.67	523	3.45	1820	12.02	701	4.63	425	2.81	539	3.56	5169	34.13
Facebook	1908	12.60	1276	8.43	3043	20.10	1202	7.94	680	4.49	1167	7.71	9276	61.26
Website	523	3.45	261	1.72	855	5.65	284	1.88	279	1.84	270	1.78	2472	16.32
Street Theatre	180	1.19	261	1.72	322	2.13	107	0.71	19	0.13	226	1.49	1115	7.36
Gomvira Song	159	1.05	228	1.51	280	1.85	111	0.73	19	0.13	192	1.27	989	6.53
SMS	1357	8.96	1081	7.14	2621	17.31	777	5.13	704	4.65	1174	7.75	7714	50.94
Others	0	0	0	0	4	0.03	1	0.01	0	0	0	0	5	0.03

FIGURE-50: EFFECTIVE MEDIA FOR CAMPAIGNING (MULTIPLE RESPONSE) (%)



4.1.8.5 List of Suggestions to Increase the Satisfaction of Electricity Customers (Multiple Response)

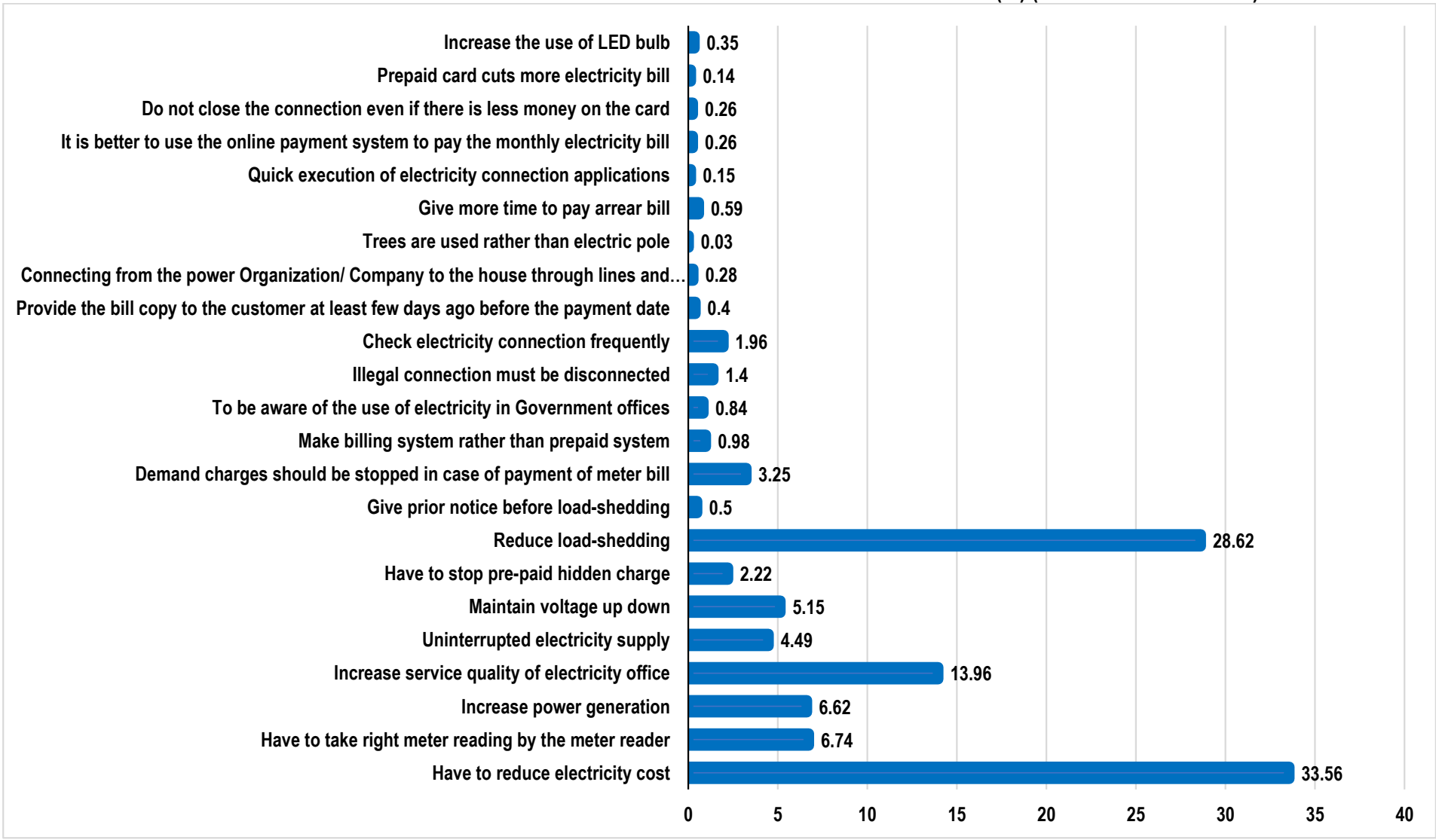
The respondents (surveyed) of the six utilities suggested the following way-forward to build a strong and healthy relationship with the power distribution Organizations/ Companies to remove the disappointments of the customers and uphold their satisfaction level better than the past. Amongst the all provided suggestions, 33.56% customers suggested as 'Have to reduce electricity cost', while 28.62%, recommended as 'Reduce load-shedding'. Others are suggested as 13.96% (Increase service quality of electricity office), 6.74% (Have to take right meter reading by the meter reader), 6.62% (Increase power generation), 5.15% (Maintain voltage up down), 4.49% (Uninterrupted electricity supply), 3.25% (Demand charges should be stopped in case of payment of meter bill), 2.22% (Have to stop pre-paid hidden charge), 1.40% (Illegal connection must be disconnected), 0.98% (Make billing system rather than prepaid system), 0.50% (Give prior notice before load-shedding), 0.84 (To be aware of the use of electricity in Government offices), 1.96% (Check electricity connection frequently), 0.59% (Give more time to pay arrear bill), 0.40% (Provide the bill copy to the customer at least few days ago before the payment date), 0.35% (Increase the use of LED bulb), 0.28% (Connecting from the power distribution Organization/ Company to the house through lines and poles), 0.26% (It is better to use the online payment system to pay the electricity bill through all mobile banking agents), 0.26% (Do not close the connection even if there is less money on the card), 0.15% (Quick

execution of electricity connection applications), 0.14% (Prepaid card cuts more electricity bill) and only 0.03% of the customers recommended as 'Trees are used rather than electric pole'. For the faster growth of the power distribution Organizations/ Companies along with healthy and win-win relationship with their customers, they should choose the best and effective way-forward for their Organizations/ Companies' healthy growth and prosperity. All over the globe, the Organizations/ Companies consider their customers as 'Boss' and listening their expectations and suggestions for positive growth of the Organization/ Company. Because of this consideration, their relationship with the customers is healthy and their Organization/ Company is growing gradually. Six utilities need to think about this matter and formulate the policy to accommodate the best suggestion of the customers to accelerate their Organization/ Company growth and excellent relationship with their customers. Details are shown below **(Table-51 and Figure-51):**

TABLE-51: CUSTOMER'S SUGGESTIONS FOR INCREASING THE SATISFACTION LEVEL (MULTIPLE RESPONSE)

Category	BPDB		BREB		DESCO		DPDC		NESCO		WZPDCL		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Have to reduce electricity cost	771	8.41	405	4.42	857	9.35	335	3.65	269	2.93	440	4.80	3077	33.56
Have to take right meter reading by the meter reader	100	1.09	15	0.16	157	1.71	140	1.53	93	1.01	113	1.23	618	6.74
Increase power generation	147	1.60	66	0.72	139	1.52	103	1.12	65	0.71	87	0.95	607	6.62
Increase service quality of electricity office	284	3.10	110	1.20	405	4.42	159	1.73	122	1.33	200	2.18	1280	13.96
Uninterrupted electricity supply	84	0.92	51	0.56	195	2.13	83	0.91	46	0.50	44	0.48	503	4.49
Maintain voltage up down	130	1.42	47	0.51	86	0.94	30	0.33	68	0.74	111	1.21	472	5.15
Have to stop pre-paid hidden charge	45	0.49	44	0.48	49	0.53	33	0.36	9	0.10	24	0.26	204	2.22
Reduce load-shedding	721	7.86	828	9.03	535	5.83	150	1.64	188	2.05	202	2.20	2624	28.62
Give prior notice before load-shedding	10	0.11	4	0.04	7	0.08	9	0.10	7	0.08	9	0.10	46	0.50
Demand charges should be stopped in case of payment of meter bill	95	1.04	42	0.46	131	1.43	3	0.03	7	0.08	20	0.22	298	3.25
Make billing system rather than prepaid system	5	0.05	9	0.10	51	0.56	14	0.15	5	0.05	6	0.07	90	0.98
To be aware of the use of electricity in Government offices	13	0.14	1	0.01	33	0.36	17	0.19	4	0.04	9	0.10	77	0.84
Illegal connection must be disconnected	29	0.32	9	0.10	70	0.76	15	0.05	3	0.03	12	0.13	128	1.40
Check electricity connection frequently	31	0.34	46	0.50	54	0.59	21	0.23	8	0.09	20	0.22	180	1.96
Provide the bill copy to the customer at least few days ago before the payment date	4	0.04	1	0.01	8	0.09	3	0.03	13	0.14	8	0.09	37	0.40
Connecting from the power Organization/ Company to the house through lines and poles	3	0.03	7	0.08	9	0.10	3	0.03	0	0	4	0.04	26	0.28
Trees are used rather than electric pole	2	0.02	2	0.02	0	0	2	0.02	2	0.02	4	0.04	12	0.03
Give more time to pay arrear bill	19	0.21	4	0.04	7	0.08	8	0.09	8	0.09	8	0.09	54	0.59
Quick execution of electricity connection applications	3	0.03	2	0.02	3	0.03	2	0.02	1	0.01	3	0.03	14	0.15
It is better to use the online payment system to pay the monthly electricity bill	5	0.05	0	0	9	0.10	8	0.09	0	0	2	0.02	24	0.26
Do not close the connection even if there is less money on the card	0	0	0	0	5	0.05	17	0.19	0	0	2	0.02	24	0.26
Prepaid card cuts more electricity bill	1	0.01	0	0	9	0.10	3	0.03	0	0	0	0	13	0.14
Increase the use of LED bulb	1	0.01	20	0.22	5	0.05	0	0	1	0.01	5	0.05	32	0.35

FIGURE-51: CUSTOMER'S SUGGESTIONS FOR INCREASING THE SATISFACTION LEVEL (%) (MULTIPLE RESPONSE)



SECTION 5: FINDING OF SAIDI AND SAIFI

5.1 INTRODUCTION

The reliability of power supply and consumer satisfaction are of paramount importance in the electric utility system. The Expectation of Consumer is a reliable and high-quality power supply that is free from faults and interruptions, allowing them to carry on with their normal lives uninterrupted. Earlier on the reliability and quality of supply were not given much attention, but there has been a shift in attitude towards prioritizing reliability and benchmarking performance. Reliability analysis necessitates a significant amount of data on consumer interruptions, including the number of affected consumers, duration of interruptions, and the type of power cuts (scheduled or unscheduled). This data is essential for evaluating and improving the reliability of the power supply system. By analysing SAIDI (System Average Interruption Duration Index), SAIFI (System Average Interruption Frequency Index), and CAIDI (Customer Average Interruption Duration Index), utilities can assess their performance and identify areas for enhancement. Ensuring a reliable and high-quality power supply involves addressing fault outages and conducting emergency maintenance promptly. Through the implementation of effective strategies, utilities can minimize interruptions, develop customer satisfaction, and perceive the evolving expectations of customers. Definition of unscheduled interruption and scheduled interruption are furnished in the table below:

S/N	Technical words	Outline of meaning
1.	**Unscheduled Interruption**	Supply Interruptions occurred to End-Use customers due to fault outage & emergency maintenance
2.	**Scheduled Interruption**	Supply Interruptions occurred to End-Use customers due to forced load shading and Scheduled maintenance and works.

5.2 METHODOLOGY USED FOR SAIDI, SAIFI AND CAIDI ANALYSIS

The methodology of the study involved measuring the system performance and customer service index (SAIDI, SAIFI and CAIDI) in selected areas of six distribution utilities/companies, which are BPDB, BREB, DPDC, DESCO, NESCO and WZPDCL. Power interruption data was collected from 14 selected zonal offices for the period of January to December 2022 (FY 2021-2022) and July to April (FY 2022-2023) for the six distribution utilities/companies, based on the discussions with the Power Cell Authority. The selected zonal distribution offices (14) included S&D Division Khulshi, Halisahar, and Agrabad under BPDB, Narayanganj PBS-1 and Mymensingh PBS-1 under BREB, NOCS division, Tejgaon and Lalbagh under DPDC, S&D division Pallabi, Uttara (west), and Tongi (west) under DESCO, S&D division-2 and S&D division-3 Rangpur under NESCO and S&D division-3 Khulna, and S&D division Satkhira under

WZPDCL. Feeder-wise interruption data was collected from the selected zonal offices of the six utilities. The data has been collected from the following pre-selected zonal distribution offices as follows:

Name of Utility	Name of Zonal Office	Nos of Feeders	Nos. of Customers
BPDB	Khulshi	29	81917
	Halisahar	10	53648
	Agrabad	14	58552
BREB	Narayanganj PBS-1	91	321005
	Mymensingh PBS-1	63	360862
DESCO	Pallabi	17	59431
	Uttara west	19	53329
	Tongi west	27	53677
DPDC	Tejgaon	34	40669
	Lalbagh	30	28665
WZPDCL	Khulna S&D -3	13	44023
	Satkhira S&D	8	52587
NESCO	Rangpur S&D-2	10	51243
	Rangpur S&D -3	7	26958
Total		372	1286566

The MIDAS team collected interruption data from the automated system-generated records of each selected zonal offices. In case, where the automated data was not available, interruption data was collected from logbooks, registers, and other available sources. The following lists provide details of the zonal offices along with the periods for which automated and manual data were collected. The MIDAS team made efforts to prioritize the use of auto generated interruption data for the reliability of the study. Auto-generated interruption data is provided by the respective zonal office in the prescribed format.

Name of Utility	Name of zonal office	Interruption Data		Remarks
		Automated	Manual	
BPDB	Khulshi	√		Automated and Manually interruption dada provided by concern divisional Company/ Organization.
	Halisahar		√	
	Agrabad	√		
BREB	Narayanganj PBS-1	√	√	
	Mymensingh PBS-1	√	√	
DESCO	Pallabi	√	√	
	Uttara west	√	√	
	Tongi west	√	√	
DPDC	Tejgaon	√		
	Lalbagh	√		
WZPDCL	Khulna S&D -3	√		
	Satkhira S&D	√		
NESCO	Rangpur S&D-1	√		
	Rangpur S&D -2	√		

5.2.1 Materials and Method

As part of the study on SAIDI, SAIFI, and CAIDI within each zonal distribution division of the six (06) utilities, the following tasks were conducted. The aim of these tasks was to assess the SAIDI, SAIFI, and CAIDI performance at the feeder level within each zonal distribution division of the six (06) utilities. By analysing these metrics, the study aimed to evaluate the reliability and quality of power supply provided by each division. As part of the scope of work, monthly calculations of SAIDI, SAIFI, and CAIDI were conducted for each zonal distribution division of the six utilities. This involved calculating the SAIDI, SAIFI, and CAIDI values on a feeder-wise basis within each division. The purpose of these calculations was to assess and analyse the interruption data at a more detailed level, allowing for a comprehensive evaluation of the reliability and performance of the distribution system in each division**.** The following tasks were conducted during collection of data:

a) Collection of data for the period of January 2022 to June 2022 of FY 2021-2022 and July 2022 to April 2023 of FY 2022-2023 of each selected zonal division.
b) Collection of interruption data from registers and logbooks of each 33/11 KV Sub-station and 11 KV switching station under 14 zonal divisional offices where automated interruption reports are not available.
c) MIDAS team collected the automated interruption data from each divisional office which is auto-generated interruption data sheet (SAS, SCADA, metering system, etc.) As per decision of the power cell.
d) The monthly feeder-wise data sheet has been prepared by extracting the necessary information from the available documents. All the data required for computation has been diligently entered into the sheet.
e) SAIDI, SAIFI, and CAIDI values have been computed on a monthly basis, taking into account the specific feeders.
f) Computed of SAIDI, SAIFI and CAIDI scheduled, unscheduled and total interruption separately.
g) Interruption due to fault is consider as unscheduled, interruption due to load shedding and schedule maintenance is considered as scheduled and sum of all consider as total interruption.
h) Prepared of graph, table, and chart of SAIDI, SAIFI and CAIDI which was analysed from data provided by divisional offices.
i) Prepared of Table and Graph on targets and achievements of SAIDI, SAIFI under six Utilities / Companies from FY 2019-20, FY 2020-21, FY 2021-22 and FY 2022-23 (July'22 to March'23).
j) The outcome of the result analysis and processed with the support of MS-Excel. The analysis included tables, charts and graphs. Report prepared based on the findings which was discussed with the professional of the six utilities and obtained the required information.
k) The collected data was processed, analysed and verified with the help of concern divisional office to ensure its accuracy.

5.2.2 RELIABILITY EVALUATION CRITERIA

5.2.2.1 System Average Interruption Duration Index (SAIDI)

The most often used performance measurement for a sustained interruption in the System Average Interruption Duration Index (SAIDI). This index measured the total duration of an interruption for the average customer during a given period of time. SAIDI is normally calculated monthly or yearly basis; however, it can also be calculated daily, or for any other time period. To calculate SAIDI, each interruption during the time period (minute) multiplied by the duration of the interruption to find the customer-minute of interruption. The customer-minutes of all interruptions are then summed to determine the total customer-minutes. To find the SAIDI value, the customer-minutes are divided by the total customers.

The formula is,

$$\mathbf{SAIDI = \Sigma (Ti * Ni) / N_T}$$

Where,

SAIDI = System Average Interruption Duration Index
Σ = Sum
Ti = Restoration time, minutes /hours.
Ni = Total number of customers interrupted.
N_T = Total number of customers served.

5.2.2.2 System Average Interruption Frequency Index (SAIFI)

The System Average Interruption Frequency Index (SAIFI) is the average number of times that a system customer experiences an outage during the month/year (or time period under study). The SAIFI is found by divided the total number of customers interrupted by the total number of customers served. SAIFI, which is a dimensionless number.

The formula is,

$$\mathbf{SAIFI = \Sigma (Ni * F_i) / N_T}$$

Where,

SAIFI = System Average Interruption frequency index
∑ = Summation function.
Ni = Total number of customers interrupted.
F_i = Number of interruptions.
N_T = Total number of customers served.

5.2.2.3 Customer Average Interruption Duration Index (CAIDI)

Once an outage occurs the average time to restore service is found from the Customer Average Interruption Duration Index (CAIDI). CAIDI is calculated similar to SAIDI except that the denominator is the number of customers interrupted versus the total number of utility customers.

The formula is,

CAIDI = Σ (Ti * Ni) / Σ (Ni)

Where,

CAIDI = Customer Average Interruption Duration Index.
∑ = Summation function.
Ti = Restoration time, minutes /hours.
Ni = Total number of customers interrupted.

Relation between SAIDI, SAIFI and CAIDI

$$\textbf{CAIDI} = \frac{System\ Average\ Interruption\ Duration\ Index}{System\ Average\ Interruption\ Frequency\ Index} = \frac{SAIDI}{SAIFI}$$

CAIDI gives the average outage duration that is experienced by any customer. CAIDI can also be viewed as the average restoration time. CAIDI is measured in units of time, often minutes or hours.

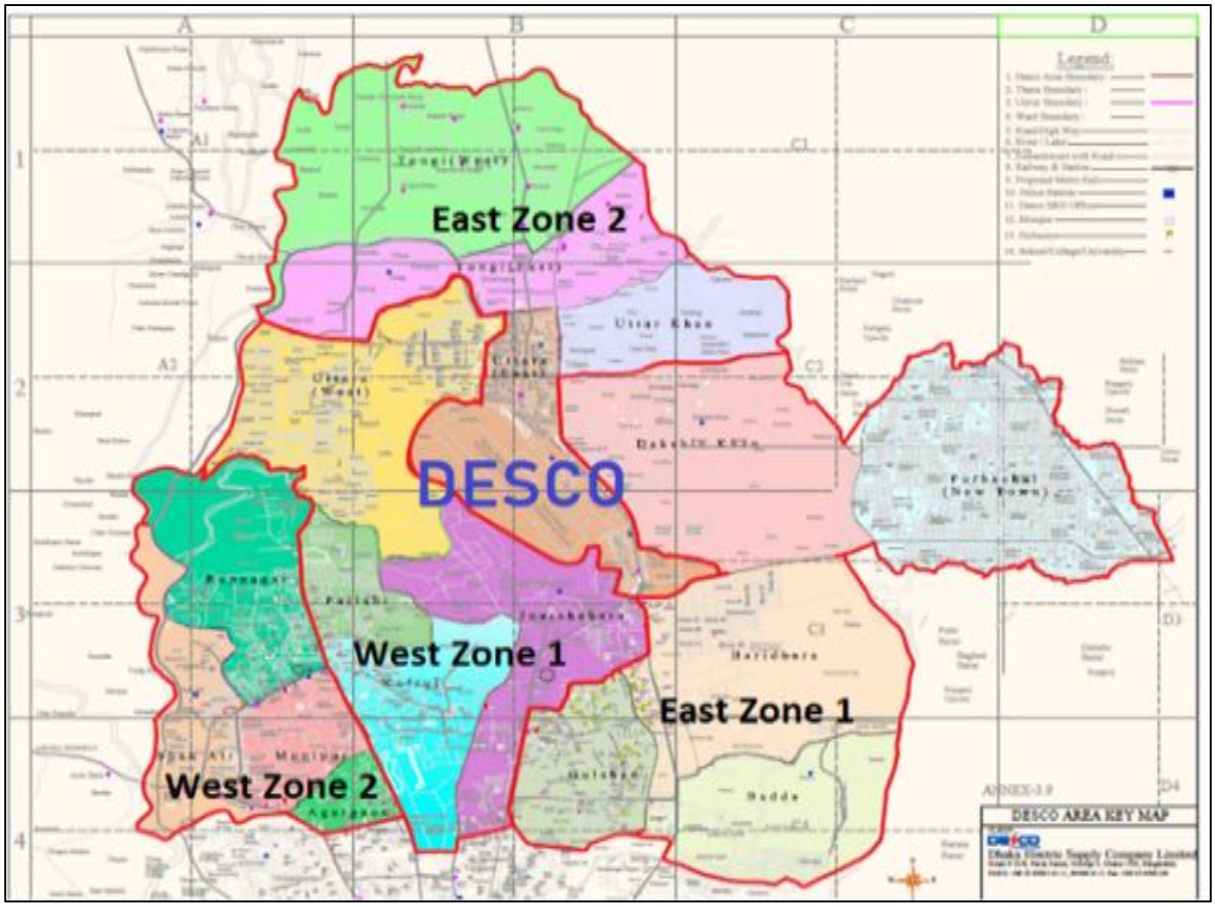
5.2.3 FINDINGS OF RESULTS

5.2.3.1 Dhaka Electric Supply Company Ltd. (DESCO)

There are 24 Sales & Distribution Divisions zonal office under DESCO. The total number of customers are 11,57,890 (June 2022) and the total number of Feeders are 533 in DESCO. By discussion with Power cell, the study conducted of Three selected areas S&D Division Pallabi, S&D Division Uttara (West), and S&D Division Tongi (West) that fall under the jurisdiction of DESCO (Dhaka Electric Supply Company Limited). The study conducted on 63 feeders and 1,66,437 customers for the periods of 16 months from January 2022 to April 2023.

The interruption data for the periods of January to June 2022 and July to April 2023 was collected. Feeder wise interruption data was computed for each month within these periods, considering both January to June 2022 and July 2022 to April 2023. The monthly SAIDI, SAIFI, and CAIDI report was summarized for the fiscal years 2021-2022 and 2022-2023. The table below shows the month-wise SAIDI, SAIFI, and CAIDI values for S&D Division Pallabi, S&D Division Uttara (West), and S&D Division Tongi (West) are details in **table-52 to 57 and figure-52**:

FIGURE-52: DESCO GEOGRAPHYCAL AREA MAP



5.2.3.1.1 STATUS OF SAIDI, SAIFI AND CAIDI FOR S&D DIVISION PALLABI, DESCO

SAIDI:

The analysis of the collected data unveiled that the total duration of **SAIDI** for the period of January 2022 to June 2022 of S&D Division Pallabi was 514.87 minutes per customer, while the scheduled load-shedding and maintenance accounted for 411.75 minutes per customer, and unscheduled fault outages were 103.11 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 1052.93 minutes per customer, where scheduled load-shedding and maintenance counted for 968.97 minutes per customer and unscheduled fault outages were 83.96 minutes per customer.

SAIFI:

The SAIFI of Pallabi, from January 2022 to June 2022, for the unscheduled fault outages was 3.39 interruptions per customer, while the scheduled load-shedding and maintenance accounted was 25.18 interruptions per customer and the total SAIFI of the scheduled and unscheduled was 28.57 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for the unscheduled fault outages was 4.97 interruptions per customer, while the scheduled load-shedding and maintenance accounted was 43.08 interruptions per customer and the result of total SAIFI for both the scheduled and unscheduled was 48.06 interruptions per customer.

CAIDI:

The CAIDI of Pallabi from January 2022 to June 2022, for the unscheduled fault outages was 30.43 minutes per interruption, while the scheduled load-shedding and maintenance accounted was 16.35 minutes per interruption and the total CAIDI of scheduled and unscheduled was 18.02 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for the unscheduled fault outages was 16.88 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 22.49 minutes per interruption and the result of total CAIDI for both the scheduled and unscheduled was 21.91 minutes per interruption.

The SAIDI, SAIFI & CAIDI of Pallabi are provided in **Table-52 to 53.**

TABLE-52: MONTHLY SAIDI, SAIFI AND CAIDI UNDER DESCO: S&D DIVISION PALLABI FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Division	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JAN_22	4	0	60	64	143	0	1896	2039	81233	81233	622528	17531	4864788	218644	5487316	236175	7.66	59.89	67.55	0.22	2.69	2.91	35.51	22.25	23.23
2	FEB_22	7	0	93	100	195	0	2047	2242	81368	81368	665499	24673	7607525	366179	8273024	390852	8.18	93.50	101.67	0.30	4.50	4.80	26.97	20.78	21.17
3	MAR_22	7	0	108	115	192	0	1563	1755	81368	81368	769945	26937	5782358	390700	6552303	417637	9.46	71.06	80.53	0.33	4.80	5.13	28.58	14.80	15.69
4	APR_22	13	2	89	104	546	58	1293	1897	81437	81437	2640729	55574	5317022	374226	7957751	429800	32.43	65.29	97.72	0.68	4.60	5.28	47.52	14.21	18.52
5	MAY_22	26	0	71	97	750	0	927	1677	81600	81600	2730780	98552	3372931	261003	6103711	359555	33.47	41.33	74.80	1.21	3.20	4.41	27.71	12.92	16.98
6	JUN_22	12	0	102	114	244	0	1553	1797	83434	83434	999049	53698	6711971	447321	7711020	501019	11.97	80.45	92.42	0.64	5.36	6.00	18.60	15.00	15.39
Total	Year JAN 2022-JUN 2022	69	2	523	594	2070	58	9279	11407	81740	490440	8428530	276965	33656595	2058073	42085125	2335038	103.11	411.75	514.87	3.39	25.18	28.57	30.43	16.35	18.02

TABLE-53: MONTHLY SAIDI, SAIFI, CAIDI UNDER DESCO: S&D DIVISION PALLABI FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JUL-22	6	0	189	195	60	0	5329	5389	58777	58777	148372	16222	16405639	587125	16554011	603347	2.52	279.12	281.64	0.28	9.99	10.27	9.15	27.94	27.44
2	AUG-22	9	0	87	96	152	0	1935	2087	58049	58049	430599	29695	8397671	383884	8828270	413579	7.42	144.67	152.08	0.51	6.61	7.12	14.50	21.88	21.35
3	SEP-22	8	0	44	52	85	0	780	865	58049	58049	397893	31869	3890706	220020	4288599	251889	6.85	67.02	73.88	0.55	3.79	4.34	12.49	17.68	17.03
4	OCT-22	11	0	82	93	210	0	1936	2146	58182	58182	879974	49806	9526503	398058	10406477	447864	15.12	163.74	178.86	0.86	6.84	7.70	17.67	23.93	23.24
5	NOV-22	4	0	40	44	130	0	851	981	58412	58412	699213	19947	3818005	174838	4517218	194785	11.97	65.36	77.33	0.34	2.99	3.33	35.05	21.84	23.19
6	DEC-22	4	0	32	36	79	0	514	593	58615	58615	227265	10964	2392591	144416	2619856	155380	3.88	40.82	44.70	0.19	2.46	2.65	20.73	16.57	16.86
7	JAN-23	4	0	34	38	77	0	745	822	58752	58752	459903	23304	2873655	128256	3333558	151560	7.83	48.91	56.74	0.40	2.18	2.58	19.73	22.41	21.99
8	FEB-23	3	0	45	48	80	0	911	991	58910	58910	322028	9484	3234787	166520	3556815	176004	5.47	54.91	60.38	0.16	2.99	2.99	0	19.43	20.21
9	MAR-23	11	0	32	43	125	0	568	693	59103	59103	555927	49428	2501344	142847	3057271	192275	9.41	42.32	51.73	0.84	2.42	3.25	11.25	17.51	15.90
10	APR-23	11	0	46	57	176	0	897	1073	59431	59431	801512	50845	3767655	179871	4569167	230716	13.49	63.40	76.88	0.86	3.03	3.88	15.76	20.95	19.80
Total	July 2022 To April 2023	71	0	631	702	1174	0	14466	15640	58628	586280	4922686	291564	56808556	2525835	61731242	2817399	83.96	968.97	1052.93	4.97	43.08	48.06	16.88	22.49	21.91

5.2.3.1.2 STATUS OF SAIDI, SAIFI AND CAIDI FOR S&D DIVISION UTTARA WEST, DESCO

SAIDI:

The analysis of the collected data unearths that the total duration of SAIDI for the period of January 2022 to June 2022 of S&D Division Uttara west was 681.11 minutes per customer, while the scheduled Load Shedding and maintenance accounted for 521.17 minutes per customer, and unscheduled fault outages were 159.93 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 1847.26 minutes per customer, where the scheduled Load Shedding and maintenance counted for 1576.32 minutes per customer and the unscheduled fault outages were 270.94 minutes per customer.

SAIFI:

The SAIFI of Uttara west, from January 2022 to June 2022, for the unscheduled fault outages was 5.57 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 28.17 interruptions per customer. And the total SAIFI of scheduled and unscheduled was 33.74 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for unscheduled fault outages was 24.03 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 29.45 interruptions per customer and the result of total SAIFI for both the scheduled and unscheduled was 53.48 interruptions per customer**.**

CAIDI:

The CAIDI of Uttara west, from January 2022 to June 2022, for the unscheduled fault outages was 28.71 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 18.66 minutes per interruption. And the total CAIDI of scheduled and unscheduled was 20.32 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for unscheduled fault outages was 11.20 minutes per interruption, while scheduled Load Shedding and maintenance accounted was 53.83 minutes per interruption and the result of total CAIDI for both scheduled and unscheduled was 34.55 minutes per interruption.

The SAIDI, SAIFI & CAIDI of Uttara west are provided in **Table 54-55:**

TABLE-54: MONTHLY SAIDI, SAIFI, CAIDI UNDER DESCO: S&D DIVISION UTTARA WEST FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JAN_22	1	0	50	51	10	0	1551	1561	55444	55444	51260	5126	5938812	208820	5990072	213946	0.92	107.11	108.04	0.09	3.77	3.86	10.00	28.44	28.00
2	FEB_22	10	0	36	46	317	0	1212	1529	55499	55499	1532285	48529	4293904	174697	5826189	223226	27.61	77.37	104.98	0.87	3.15	4.02	31.57	24.58	26.10
3	MAR_22	7	0	65	72	95	0	1182	1277	51600	51600	327270	26157	4571684	248415	4898954	274572	6.34	88.60	94.94	0.51	4.81	5.32	12.51	18.40	17.84
4	APR_22	24	0	58	82	906	0	835	1741	52123	52123	4658733	111976	3576156	242820	8234889	354796	89.38	68.61	157.99	2.15	4.66	6.81	41.60	14.73	23.21
5	MAY_22	33	0	69	102	587	0	1068	1655	52290	52290	1339792	82592	4695781	289152	6035573	371744	25.62	89.80	115.42	1.58	5.53	7.11	16.22	16.24	16.24
6	JUN_22	10	0	77	87	242	0	1306	1548	50210	50210	504829	18723	4502861	313948	5007690	332671	10.05	89.68	99.73	0.37	6.25	6.63	26.96	14.34	15.05
Total	Year JAN 2022-JUN 2022	85	0	355	440	2157	0	7154	9311	52861	317166	8414169	293103	27579198	1477852	35993367	1770955	159.93	521.17	681.11	5.57	28.17	33.74	28.71	18.66	20.32

TABLE-55: MONTHLY SAIDI, SAIFI, CAIDI UNDER DESCO: S&D DIVISION UTTARA WEST FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JUL-22	9	0	113	122	112	0	3064	3176	49037	49037	1077141	69019	7734412	289524	8811553	358543	21.97	157.73	179.69	1.41	5.90	7.31	15.61	26.71	24.58
2	AUG-22	13	0	61	74	478	0	19591	20069	49516	49516	1146606	75666	50144277	138844	51290883	214510	23.16	1012.69	1035.84	1.53	2.80	4.33	15.15	361.16	239.11
3	SEP-22	9	0	42	51	142	0	681	823	49722	49722	886667	69019	1535100	92727	2421767	161746	17.83	30.87	48.71	1.39	1.86	3.25	12.85	16.56	14.97
4	OCT-22	30	0	108	138	315	0	2624	2939	50110	50110	2567599	224990	7452810	293836	10020409	518826	51.24	148.73	199.97	4.49	5.86	10.35	11.41	25.36	19.31
5	NOV-22	10	0	43	53	142	0	806	948	50558	50558	1550332	105070	1699688	100095	3250020	205165	30.66	33.62	64.28	2.08	1.98	4.06	14.76	16.98	15.84
6	DEC-22	9	0	45	54	113	0	925	1038	50709	50709	721928	66347	3230613	155006	3952541	221353	14.24	63.71	77.95	1.31	3.06	4.37	10.88	20.84	17.86
7	JAN-23	15	0	28	43	132	0	748	880	51180	51180	784453	99882	2020558	79442	2805011	179324	15.33	39.48	54.81	1.95	1.55	3.50	7.85	25.43	15.64
8	FEB-23	15	0	24	39	125	0	513	638	51180	51180	1188817	123939	1255570	69650	2444387	193589	23.23	24.53	47.76	2.42	1.36	3.78	9.59	18.03	12.63
9	MAR-23	35	0	40	75	405	0	698	1103	52905	52905	2941592	295537	2273260	124203	5214852	419740	55.60	42.97	98.57	5.59	2.35	7.93	9.95	18.30	12.42
10	APR-23	15	0	48	63	143	0	913	1056	53329	53329	905241	99567	2769743	144921	3674984	244488	16.97	51.94	68.91	1.87	2.72	4.58	9.09	19.11	15.03
Total	YEAR: JULY 2022 TO APRIL 2023	160	0	552	712	2107	0	30563	32670	50825	508246	13770376	1229036	80116031	1488248	93886407	2717284	270.23	1606.26	1876.49	24.03	29.45	53.48	11.20	53.83	34.55

5.2.3.1.3 STATUS OF SAIDI, SAIFI AND CAIDI FOR S&D DIVISION TONGI WEST, DESCO

SAIDI:

The analysis of the collected data revealed that the total duration of **SAIDI** for the period of January 2022 to June 2022 of S&D division Tongi West was 414.76 minutes per customer, while the scheduled Load Shedding and maintenance accounted for 249.11 minutes per customer, and the unscheduled fault outages were 165.64 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 862.88 minutes per customer where the scheduled Load Shedding and maintenance counted for 805.86 minutes per customer and the unscheduled fault outages were 57.02 minutes per customer.

SAIFI:

The SAIFI of Tongi West from January 2022 to June 2022, for the unscheduled fault outages was 5.50 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 14.27 interruptions per customer. And the total SAIFI of the scheduled and unscheduled was 20.63 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for the unscheduled fault outages was 3.89 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 41.30 interruptions per customer and the result of total SAIFI for both the scheduled and unscheduled was 45.19 interruptions per customer.

CAIDI:

The CAIDI of Tongi West from January 2022 to June 2022, for the unscheduled fault outages was 30.12 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 17.45 minutes per interruption. And the total CAIDI of the scheduled and unscheduled was 20.10 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for the unscheduled fault outages was 14.64 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 19.51 minutes per interruption and the result of total CAIDI for both the scheduled and unscheduled was 19.09 minutes per interruption.

The SAIDI, SAIFI & CAIDI of Tongi West are provided in **Table-56 to 57:**

TABLE-56: MONTHLY SAIDI, SAIFI, CAIDI UNDER DESCO: S&D DIVISION TONGI WEST FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of the Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JAN_22	13	0	30	43	177	0	295	472	64291	64291	995790	52382	1353390	116075	2349180	182377	15.49	21.05	36.54	0.81	1.81	2.84	19.01	11.66	12.88
2	FEB_22	8	0	34	42	145	0	876	1021	64291	64291	633699	30675	3481422	139512	4115121	170187	9.86	54.15	64.01	0.48	2.17	2.65	20.66	24.95	24.18
3	MAR_22	28	0	29	57	794	0	651	1445	65814	65814	2851096	96618	1384782	70947	4235878	181665	43.32	21.04	64.36	1.47	1.08	2.76	29.51	19.52	23.32
4	APR_22	21	0	58	79	538	0	715	1253	65814	65814	2480020	55411	2476965	218844	4956985	288355	37.68	37.64	75.32	0.84	3.33	4.38	44.76	11.32	17.19
5	MAY_22	18	0	51	69	419	0	685	1104	65814	65814	2020998	61130	2538331	179443	4559329	247623	30.71	38.57	69.28	0.93	2.73	3.76	33.06	14.15	18.41
6	JUN_22	17	8	45	70	404	340	952	1696	66453	66453	1853673	63522	5060254	208761	6913927	279387	27.89	76.15	104.04	0.96	3.14	4.20	29.18	24.24	24.75
Total	Year JAN 2022-JUN 2022	105	8	247	360	2477	340	4174	6991	65413	392477	10835276	359738	16295144	933582	27130420	1349594	165.64	249.11	414.76	5.50	14.27	20.63	30.12	17.45	20.10

TABLE-57: MONTHLY SAIDI, SAIFI, CAIDI UNDER DESCO: S&D DIVISION, TONGI WEST FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JUL-22	4	0	68	72	77	0	1780	1857	53072	53072	188728	10693	4860807	187301	5049535	197994	3.56	91.59	95.14	0.20	3.53	3.73	17.65	25.95	25.50
2	AUG-22	6	0	77	83	40	0	1529	1569	53346	53346	111876	17704	6150266	315194	6262142	332898	2.10	115.29	117.39	0.33	5.91	6.24	6.32	19.51	18.81
3	SEP-22	4	0	78	82	48	0	1279	1327	53709	53709	188993	14789	4222831	255187	4411824	269976	3.52	78.62	82.14	0.28	4.75	5.03	12.78	16.55	16.34
4	OCT-22	6	0	113	119	132	0	2688	2820	63878	63878	615586	22061	11063647	467206	11679233	489267	9.64	173.20	182.84	0.35	7.31	7.66	27.90	23.68	23.87
5	NOV-22	4	0	34	38	119	0	715	834	55377	55377	557212	15895	2761249	139649	3318461	155544	10.06	49.86	59.92	0.29	2.52	2.81	35.06	19.77	21.33
6	DEC-22	8	0	31	39	57	0	612	669	55377	55377	354019	47822	2500762	135362	2854781	183184	6.39	45.16	51.55	0.86	2.44	3.31	7.40	18.47	15.58
7	JAN-23	2	0	75	77	18	0	1318	1336	55377	55377	45839	4859	3484337	207081	3530176	211940	0.83	62.92	63.75	0.09	3.74	3.83	9.43	16.83	16.66
8	FEB-23	3	0	53	56	20	0	824	844	54197	54197	104886	14296	2882080	167485	2986966	181781	1.94	53.18	55.11	0.26	3.09	3.35	7.34	17.21	16.43
9	MAR-23	15	0	52	67	224	0	895	1119	54197	54197	714684	44279	3577604	220066	4292288	264345	13.19	66.01	79.20	0.82	4.06	4.88	16.14	16.26	16.24
10	APR-23	8	0	68	76	115	0	1117	1232	53677	53677	267075	22625	2996542	185863	3263617	208488	4.98	55.83	60.80	0.42	3.46	3.88	11.80	16.12	15.65
Total	YEAR: JULY-22 TO APRIL 2023	60	0	649	709	850	0	12757	13607	55221	552207	3148898	215023	44500125	2280394	47649023	2495417	57.02	805.86	862.88	3.89	41.30	45.19	14.64	19.51	19.09

5.2.3.1.4 SUMMARY OF DESCO- PALLABI, UTTARA (WEST) AND TONGI (WEST) ARE GIVEN BELOW BASED ON THE TABLE-52 TO 57

Power Cell established SAIDI and SAIFI targets for DESCO as key performance indicators (KPIs) during the FY 2021-2022, with targets of 500 minutes per customer for SAIDI and 25 interruptions per customer for SAIFI. In the selected three S&D Divisions, the average SAIFI was 27.28 interruptions per customer and the average SAIDI was 526.01 minutes per customer over a period of 6 months (January 22 to June 22).

In the FY 2022-2023, the targets for SAIDI and SAIFI were set as 1420 minutes per customer and 25 interruptions per customer respectively. In the selected divisions, the average SAIDI and SAIFI were 1234.36 minutes per customer and 48.75 interruptions per customer respectively, over a period of 10 months (July 22 to April 23).

The average SAIDI and SAIFI due to fault outage were 132.64 minutes per customer and 10.54 interruptions per customer respectively, which were within the targets set by Power Cell. During the period of July 22 to November 2022, NLDC[10] imposed more forced load shedding due to generation and transmission limitations.

The SAIDI and SAIFI due to forced load shedding were 1101.73 minutes per customer and 38.22 interruptions per customer respectively. SAIDI, SAIFI, and CAIDI were separately calculated for the unscheduled (fault outage) and scheduled (load shedding and scheduled maintenance) events.

After July 2022, it was observed that SAIDI and SAIFI increased during the scheduled outages due to generation and transmission limitations. The summary of average of SAIDI, SAIFI, and CAIDI for the three divisional offices under DESCO is shown in **Table-58 and Table-59** for the FY 2021-2022 and 2022-2023 respectively.

[10] National Load Dispatch Centre

TABLE-58: SUMMARY FOR THE MONTH OF JANUARY 2022–JUNE 2022 (FY2021-2022)
DESCO: AVERAGE SAIDI SAIFI AND CAIDI OF S&D: PALLABI, UTTARA WEST AND TONGI WEST

Name of the Division	Name of the year	Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
				Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
PALLABI	YEAR: JAN - JUN 2022	81740	490440	8428530	276965	33656595	2058073	42085125	2335038.00	103.11	411.75	514.87	3.39	25.18	28.57	30.43	16.35	18.02
UTTARA	YEAR: JAN - JUN 2022	52861	317166	8414169	293103	27579198	1477852	35993367	1770955.00	159.18	521.73	680.91	5.54	27.96	33.50	28.71	18.66	20.32
TONGI	YEAR: JAN 22-JUN22	65413	392477	10835276	359738	16295144	933582	27130420	1349594	165.64	249.11	414.76	5.50	14.27	20.63	30.12	17.45	20.10
Total	YEAR: JAN22-JUN22	200014	1200083	27677975	929806	77530937	4469507	105208912	5455587	138.38	387.63	526.01	4.65	22.35	27.28	29.77	17.35	19.28

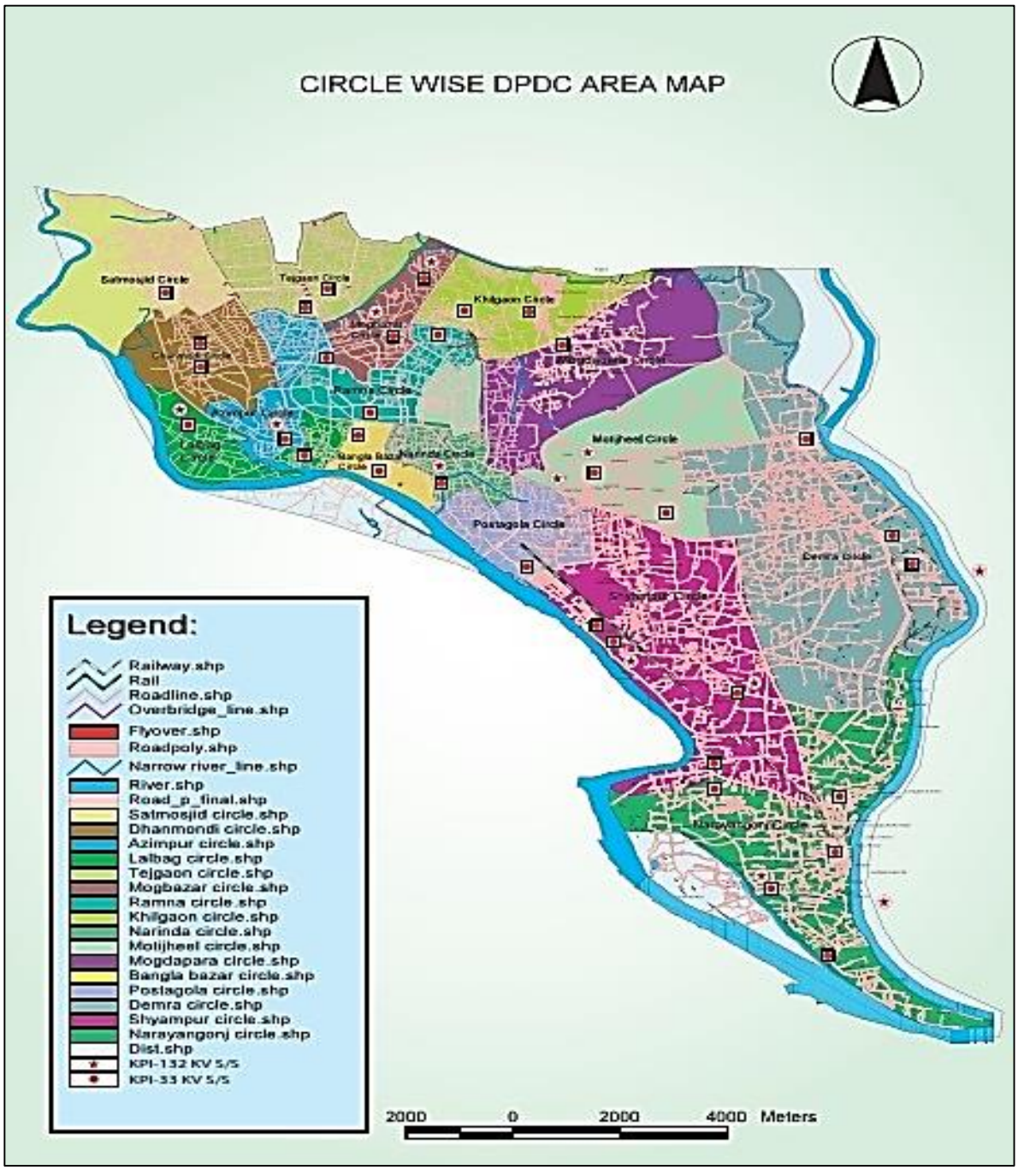
TABLE -59: SUMMARY: FOR THE MONTH OF JULY 2022- APRIL 2023 (FY 2022-2023)
DESCO: AVERAGE SAIDI SAIFI AND CAIDI OF S&D: PALLABI, UTTARA WEST AND TONGI WEST

Name of the Division	Name of the year	Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
				Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
PALLABI	YEAR: JUL22-APR23	58628	586280	4922686	291564	56808556	2525835	61731242	2817399.00	83.96	968.97	1052.93	4.97	43.08	48.06	16.88	22.49	21.91
UTTARA	YEAR: JUL22-APR23	50825	508246	13770376	1229036	80116031	1488248	93886407	2717284.00	270.94	1576.32	1876.26	24.18	29.28	53.48	11.20	53.83	34.55
TONGI	YEAR: JUL22-APR23	55221	552207	3148898	215023	44500125	2280394	47649023	2495417	57.02	805.86	862.88	3.89	41.30	45.19	14.64	19.51	19.09
Total	YEAR: JUL22-APR23	164673	1646733	21841960	1735623	181424712	6294477	203266672	8030100.00	132.64	1101.73	1234.36	10.54	38.22	48.76	12.58	28.82	25.31

5.2.3.2 Dhaka Power Distribution Company Ltd. (DPDC)

The interruption data was collected from NOCS Division Lalbagh and NOCS Division Tejgaon, which fall under the area of DPDC. The data was collected for the period of January to June 2022 and July to April 2023. Feeder-wise interruption data was computed for each month during this period. A monthly summary report of SAIDI, SAIFI, and CAIDI was prepared for the FY 2021-2022 and FY 2022-2023. The month-wise SAIDI, SAIFI, and CAIDI values for NOCS Division Lalbagh and NOCS Division Tejgaon are given in **Table-60 to 63 and figure-53** respectively for the FY 2021-2022 and FY 2022-2023.

FIGURE-53: DPDC GEOGRAPHICAL AREA MAP



5.2.3.2.1 STATUS OF SAIDI, SAIFI AND CAIDI FOR NOCS LALBAGH, DPDC

SAIDI:

The analysis of the collected data unveiled that the total duration of **SAIDI** for the period of January 2022 to June 2022 of NOCS Lalbagh was 305.91 minutes per customer, while the scheduled Load Shedding and maintenance accounted for 135.38 minutes per customer, and the unscheduled fault outages were 170.53 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 4810.03 minutes per customer, where the scheduled Load Shedding and maintenance counted for 4481.97 minutes per customer and the unscheduled fault outages were 328.05 minutes per customer.

SAIFI:

The SAIFI of NOCS Lalbagh, from January 2022 to June 2022, for the unscheduled fault outages was 7.02 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 5.53 interruptions per customer. And the total SAIFI of the scheduled and unscheduled was 12.55 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for unscheduled fault outages was 22.57 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 90.32 interruptions per customer and the result of total SAIFI for both the scheduled and unscheduled was 112.89 interruptions per customer.

CAIDI:

The CAIDI of NOCS Lalbagh from January 2022 to June 2022, for the unscheduled fault outages was 24.28 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 24.49 minutes per interruption and the total CAIDI of the scheduled and unscheduled was 24.37 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for the unscheduled fault outages was 14.54 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 49.62 minutes per interruption and the result of total CAIDI for both the scheduled and unscheduled was 42.61 minutes per interruption.

The SAIDI, SAIFI & CAIDI of NOCS Lalbagh are provided in **Table-60 to 61 below:**

TABLE-60: MONTHLY SAIDI, SAIFI, CAIDI UNDER DPDC: NOCS LALBAGH FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JAN_22	44	0	19	63	2008	0	415	2423	27028	27028	840718	29982	454246	21690	1294964	51672	31.11	16.81	47.91	1.11	0.80	1.91	28.04	20.94	25.06
2	FEB_22	38	0	25	63	773	0	601	1374	27089	27089	735540	30982	584945	23676	1320485	54658	27.15	21.59	48.75	1.14	0.87	2.02	23.74	24.71	24.16
3	MAR_22	34	0	20	54	677	0	431	1108	27268	27268	726101	33388	468328	20386	1194429	53774	26.63	17.18	43.80	1.22	0.75	1.97	21.75	22.97	22.21
4	APR_22	35	0	29	64	780	0	824	1604	27329	27329	714577	28965	706842	27957	1421419	56922	26.15	25.86	52.01	1.06	1.02	2.08	24.67	25.28	24.97
5	MAY_22	33	0	26	59	768	0	800	1568	27521	27521	766655	32380	728702	26660	1495357	59040	27.86	26.48	54.34	1.18	0.97	2.15	23.68	27.33	25.33
6	JUN_22	41	0	28	69	897	0	800	1697	27647	27647	874230	36164	754707	30631	1628937	66795	31.62	27.30	58.92	1.31	1.11	2.42	24.17	24.64	24.39
Total	Year 2022	225	0	147	372	5903	0	3871	9774	27314	163882	4657821	191861	3697770	151000	8355591	342861	170.53	135.38	305.91	7.02	5.53	12.55	24.28	24.49	24.37

TABLE-61: MONTHLY SAIDI, SAIFI AND CAIDI UNDER DPDC: NOCS LALBAGH FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JUL-22	35	421	34	490	724	19809	1264	0	27829	27829	603413	32106	19565028	428667	20168441	460773	21.68	703.04	724.73	1.15	15.40	16.56	18.79	45.64	43.77
2	AUG-22	47	465	71	583	354	22544	1636	0	27904	27904	320230	49821	23871720	524573	24191950	574394	11.48	855.49	866.97	1.79	18.80	20.58	6.43	45.51	42.12
3	SEP-22	86	331	43	460	1547	18236	639	20422	28084	28084	1386912	80842	19543525	378290	20930437	459132	49.38	695.90	745.28	2.88	13.47	16.35	17.16	51.66	45.59
4	OCT-22	121	868	31	1020	1547	54439	837	56823	28097	28097	1390142	112102	58257243	950595	59647385	1062697	49.48	2073.43	2122.91	3.99	33.83	37.82	12.40	61.29	56.13
5	NOV-22	87	46	31	164	2293	1801	642	4736	28197	28197	1610666	76689	2642471	84878	4253137	161567	57.12	93.71	150.84	2.72	3.01	5.73	21.00	31.13	26.32
6	DEC-22	60	0	43	103	1721	0	717	2438	28336	28336	1255446	55328	755084	48114	2010530	103442	44.31	26.65	70.95	1.95	1.70	3.65	22.69	15.69	19.44
7	JAN-23	89	0	34	123	1706	0	721	0	28350	28350	1250855	80262	793603	39495	2044458	119757	44.12	27.99	72.11	2.83	1.39	4.22	15.58	20.09	17.07
8	FEB-23	83	0	40	123	852	0	569	1421	28446	28446	718077	77937	466293	36870	1184370	114807	25.24	16.39	41.64	2.74	1.30	4.04	9.21	12.65	10.32
9	MAR-23	74	0	54	128	805	0	717	0	28484	28484	728269	72268	672376	59174	1400645	131442	25.57	23.61	49.17	2.54	2.08	4.61	10.08	11.36	10.66
10	APR-23	66	0	52	118	904	0	720	0	28665	28665	817454	66911	607998	50658	1425452	117569	28.52	21.21	49.73	2.33	1.77	4.10	12.22	12.00	12.12
Total	JULY 22-APR23	682	2131	381	3194	11549	116829	7742	85840	28239	253727	9264010	637355	126567343	2550656	135831353	3188011	328.05	4481.97	4810.03	22.57	90.32	112.89	14.54	49.62	42.61

5.2.3.2.2 STATUS OF SAIDI, SAIFI AND CAIDI FOR NOCS TEJGAON, DPDC

SAIDI:

The analysis of the collected data disclosed that the total duration of **SAIDI** for the period of January 2022 to June 2022 of NOCS Tejgaon was 359.22 minutes per customer, while the scheduled Load Shedding and maintenance accounted for 240.20 minutes per customer, and the unscheduled fault outages were 119.03 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 8437.95 minutes per customer, where the scheduled Load Shedding and maintenance counted for 8206.24 minutes per customer and the unscheduled fault outages were 231.70 minutes per customer.

SAIFI:

The SAIFI of NOCS Tejgaon, from January 2022 to June 2022, for the unscheduled fault outages was 11.92 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 31.18 interruptions per customer and the total SAIFI of the scheduled and unscheduled was 35.61 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for the unscheduled fault outages was 21.99 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 189.57 interruptions per customer and the result of total SAIFI for both the scheduled and unscheduled was 212.57 interruptions per customer.

CAIDI:

The CAIDI of NOCS Tejgaon, from January 2022 to June 2022, for the unscheduled fault outages was 9.99 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 7.70 minutes per interruption and the total CAIDI of the scheduled and unscheduled was 10.09 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for the unscheduled fault outages was 10.54 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 43.29 minutes per interruption and the result of total CAIDI for both the scheduled and unscheduled was 39.70 minutes per interruption.

The SAIDI, SAIFI & CAIDI of NOCS Tejgaon are provided in **Table-62 to 63 below:**

TABLE-62: MONTHLY SAIDI, SAIFI AND CAIDI UNDER DPDC: NOCS TEJGAON FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JAN_22	33	0	66	99	259	0	448	707	38435	38435	518113	68212	1064215	171084	1582328	239336	13.48	27.69	41.17	1.77	4.45	6.23	7.60	6.22	6.61
2	FEB_22	25	0	104	129	147	0	1560	1707	38607	38607	319005	52887	3940695	262713	4259700	315640	8.26	102.07	110.33	1.37	6.80	8.18	6.03	15.00	13.50
3	MAR_22	42	0	66	0	416	0	448	864	38775	38775	1113822	118018	1073891	172654	2187713	0	28.73	27.70	56.42	3.04	4.45	0.00	9.44	6.22	0.00
4	APR_22	38	0	66	104	367	0	448	815	38860	38860	944989	104888	1076437	173021	2021426	277949	24.32	27.70	52.02	2.70	4.45	7.15	9.01	6.22	7.27
5	MAY_22	31	0	80	111	410	0	448	858	39012	39012	1019660	65201	1080655	214788	2100315	280029	26.14	27.70	53.84	1.67	5.51	7.18	15.64	5.03	7.50
6	JUN_22	19	0	80	99	252	0	448	700	39122	39122	702899	53173	1084156	215431	1787055	268604	17.97	27.71	45.68	1.36	5.51	6.87	13.22	5.03	6.65
Total	YEAR: JAN22-JUN22	188	0	462	542	1851	0	3800	5651	38802	232811	4618488	462379	9320049	1209691	13938537	1381558	119.03	240.20	359.22	11.92	31.18	35.61	9.99	7.70	10.09

TABLE-63: MONTHLY SAIDI, SAIFI, CAIDI UNDER DPDC: NOCS TEJGAON FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JUL-22	31	193	82	306	345	11580	569	12494	39341	39341	724233	61771	24245692	597965	24969925	659777	18.41	616.30	634.70	1.57	15.20	16.77	11.72	40.55	37.85
2	AUG-22	42	514	82	638	426	30840	570	31836	39438	39438	1028580	101133	62348964	1233539	63377544	1334712	26.08	1580.94	1607.02	2.56	31.28	33.84	10.17	50.54	47.48
3	SEP-22	38	442	94	574	415	26520	570	27505	39781	39781	1021690	82483	51841318	1094791	52863008	1177274	25.68	1303.17	1328.85	2.07	27.52	29.59	12.39	47.35	44.90
4	OCT-22	30	1336	96	1462	300	80160	531	80991	39976	39976	729090	72909	142304388	2600435	143033478	2673344	18.24	3559.75	3577.98	1.82	65.05	66.87	10.00	54.72	53.50
5	NOV-22	37	94	86	217	370	5640	531	6541	40077	40077	1030130	103013	14171791	432569	15201921	535582	25.70	353.61	379.32	2.57	10.79	13.36	10.00	32.76	28.38
6	DEC-22	39	94	86	219	390	5640	531	6561	40157	40157	875090	87509	14199649	433447	15074739	520956	21.79	353.60	375.40	2.18	10.79	12.97	10.00	32.76	28.94
7	JAN-23	30	94	86	210	300	5640	531	6471	40278	40278	735560	73556	14241682	434757	14977242	508313	18.26	353.58	371.85	1.83	10.79	12.62	10.00	32.76	29.46
8	FEB-23	34	0	97	131	340	0	531	871	40358	40358	868620	86862	1345051	262468	2213671	349330	21.52	33.33	54.85	2.15	6.50	8.66	10.00	5.12	6.34
9	MAR-23	42	0	90	132	398	0	734	1132	40496	40496	1142304	119519	1960291	245898	3102595	365417	28.21	48.41	76.61	2.95	6.07	9.02	9.56	7.97	8.49
10	APR-23	52	0	89	141	425	0	769	1194	40669	40669	1126272	132207	2068577	258084	3194849	390291	27.69	50.86	78.56	3.25	6.35	9.60	8.52	8.02	8.19
TOTAL	YEAR: JUL 2022 TO APR 2023	375	2767	888	4030	3709	166020	5867	175596	40058	400571	9281569	920962	328727403	7593953	338008972	8514996	231.70	8206.24	8437.95	22.99	189.57	212.57	10.08	43.29	39.70

5.2.3.2.3 SUMMARY OF DPDC- LALBAGH AND TEJGAON ARE GIVEN BELOW BASED ON THE TABLE-60 TO 63

The collected data was analysed and verified with the support of the Power Cell. The Power Cell set up the target of SAIDI and SAIFI for DPDC as Key Performance Indicators (KPIs). The target for SAIDI and SAIFI of DPDC during the FY 2021-2022 was 700 minutes per customer and 70 interruptions per customer. The average SAIFI and SAIDI of the two NOCS divisions under DPDC were 26.08 interruptions per customer and 337.20 minutes per customer for a period of 6 months (January to July 2022) which within the Target Set Up by The Power Cell.

For the financial year 2022-2023, the target of SAIDI and SAIFI for DPDC was set as 1390 minutes per customer and 95 interruptions per customer. Under the selected division, the average SAIDI and SAIFI were 6937.90 minutes per customer and 171.35 interruptions per customer for a period of 10 months (July 2022 to April 2023).

It is mentioned that the average SAIDI and SAIFI due to fault outage were 22.23 interruptions per customer and 271.54 minutes per customer, which were within the target set up by the Power Cell. The SAIDI and SAIFI due to forced load shedding were 6666.36 minutes per customer and 148.54 interruptions per customer.

SAIDI, SAIFI, and CAIDI due to the unscheduled (fault outage) and scheduled (load shedding and maintenance) are separately calculated. After July 2022, it shows that SAIDI and SAIFI increased in scheduled outages due to the generation and transmission limitations. The summary of average SAIDI, SAIFI, and CAIDI for the two NOCS divisions under DPDC is shown in **Table-64 and 65** for the FY 2021-2022 and 2022-2023, respectively.

TABLE-64: SUMMARY FOR THE MONTH OF JANUARY 2022 - JUNE 2022 (FY 2021-2022)
DPDC: AVERAGE SAIDI SAIFI AND CAIDI OF NOCS LALBAGH AND TEJGAON

Name of the Division	Name of the year	Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
				Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
LALBAGH	YEAR: JAN - JUN 2022	27314	163882	4657821	191861	3697770	151000	8355591	342861.00	170.53	135.38	305.91	7.02	12.55	12.55	24.28	24.49	24.37
TEJGAON	YEAR: JAN22-JUN22	38802	232811	4618488	462379	9320049	1209691	13938537	1381558	119.03	240.20	359.22	11.92	31.18	35.61	9.99	7.70	10.09
Total	YEAR: JAN22-JUN22	66116	396693	9276309	654240	13017819	1360691	22294128	1724419	140.30	196.90	337.20	9.90	20.58	26.08	14.18	9.57	12.93

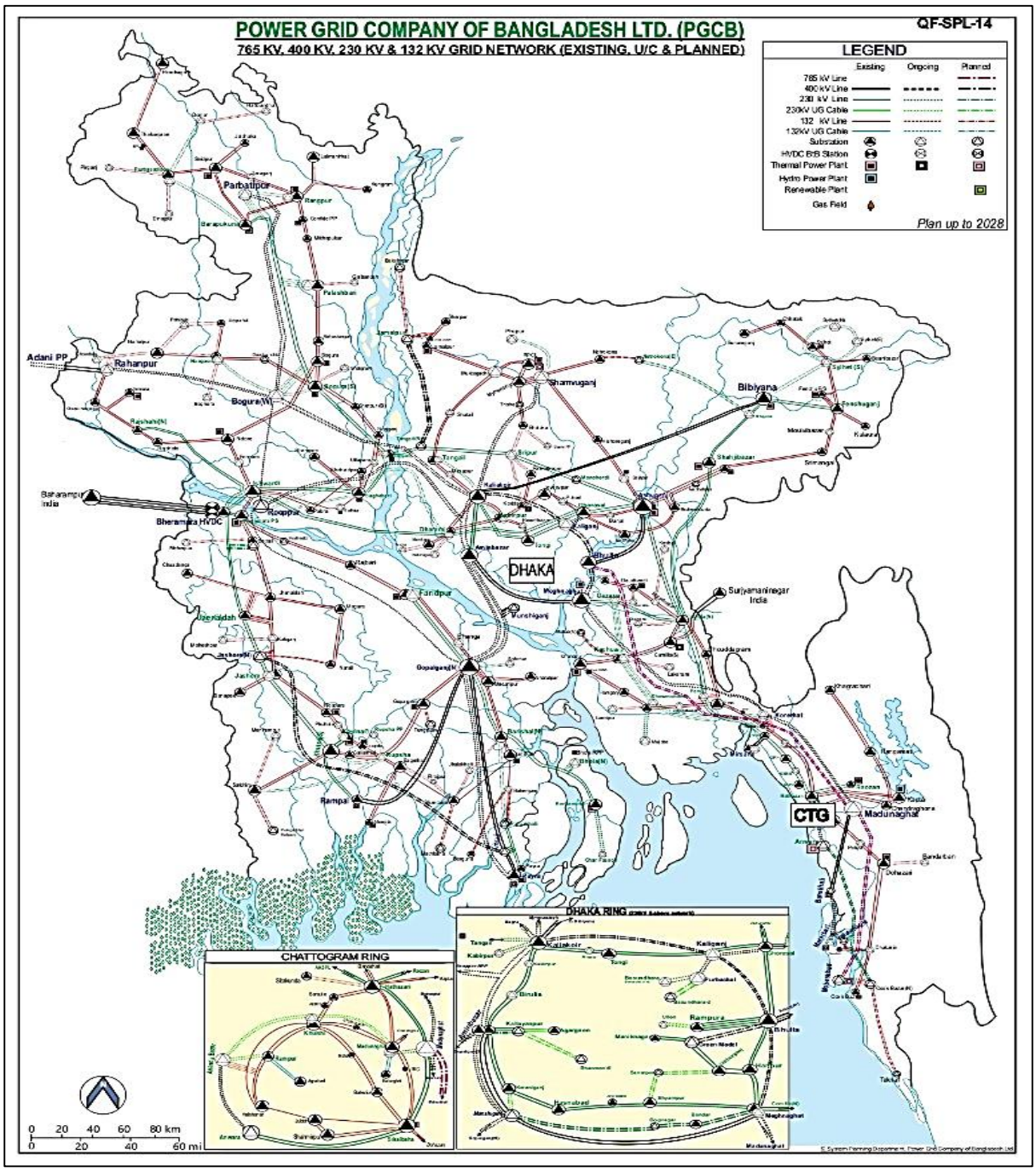
TABLE-65: SUMMARY FOR THE MONTH OF JULY 2022- APRIL 2023 (FY 2022-2023)
DPDC: AVERAGE SAIDI SAIFI AND CAIDI OF NOCS LALBAGH AND TEJGAON

Name of the Division	Name of the year	Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
				Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
LALBAGH	YEAR: JUL22 - APR2023	28239	253727	9264010	637355	126567343	2550656	135831353	3188011.00	328.05	4481.97	4810.03	22.57	90.32	112.89	14.54	49.62	42.61
TEJGAON	YEAR: JUL22-APR23	40058	400571	9281569	920962	328727403	7593953	338008972	8514996	231.70	8206.24	8437.95	22.99	189.57	212.57	10.08	43.29	39.70
Total	YEAR: JUL22-APR23	68297	654298	18545579	1558317	455294746	10144609	473840325	11703007	271.54	6666.36	6937.90	22.82	148.54	171.35	11.90	44.88	40.49

5.2.3.3 Bangladesh Power Development Board (BPDB)

Interruption data of S&D Division Halisahar, S&D Division Khulshi, and S&D Division Agrabad, Chattogram were collected from their respective divisional offices for the period of January to June 2022 and July to April 2023. Feeder-wise interruption data was computed for each month during the mentioned periods. The monthly feeder-wise SAIDI, SAIFI, and CAIDI reports are provided below. **Table-66 to 71 and figure-54** illustrate the month-wise SAIDI, SAIFI, and CAIDI of S&D Division Halisahar, Khulshi, and Agrabad for the FY 2021-2022 and 2022-2023.

FIGURE-54: BPDB GEOGRAPHICAL AREA MAP



5.2.3.3.1 STATUS OF SAIDI, SAIFI AND CAIDI FOR S&D DIVISION HALISAHAR OF BPDB, CHATTOGRAM

SAIDI:

The analysis of the collected data unveiled that the total duration of SAIDI for the period of January 2022 to June 2022 of S&D division Halisahar was 156.19 minutes per customer, while the scheduled Load Shedding and maintenance accounted for 91.69 minutes per customer, and the unscheduled fault outages were 64.50 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 6440.96 minutes per customer where the scheduled Load Shedding and maintenance counted for 6237.45 minutes per customer and the unscheduled fault outages were 203.51 minutes per customer.

SAIFI:

The SAIFI of Halisahar from January 2022 to June 2022, for the unscheduled fault outages was 5.98 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 6.78 interruptions per customer. And the total SAIFI of the scheduled and unscheduled was 12.76 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for the unscheduled fault outages was 17.44 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 136.03 interruptions per customer and the result of total SAIFI for both the scheduled and unscheduled was 153.47 interruptions per customer.

CAIDI:

The CAIDI of Halisahar, from January 2022 to June 2022, for the unscheduled fault outages was 10.79 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 13.53 minutes per interruption. And the total CAIDI of the scheduled and unscheduled was 12.24 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for the unscheduled fault outages was 11.67 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 45.85 minutes per interruption and the result of total CAIDI for both the scheduled and unscheduled was 41.97 minutes per interruption.

The SAIDI, SAIFI & CAIDI of Halisahar are provided in **Table-66 to 71.**

TABLE-66: MONTHLY SAIDI, SAIFI, CAIDI UNDER BPDB: S&D DIVISION HALISAHAR FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JAN_22	65	0	50	115	462	0	576	1038	50644	12972	594279	82886	754406	65179	1348685	148065	11.73	14.90	26.63	1.64	1.29	2.92	7.17	11.57	9.11
2	FEB_22	32	0	34	66	352	0	393	745	50710	13399	468354	42497	521581	45092	989935	87589	9.24	10.29	19.52	0.84	0.89	1.73	11.02	11.57	11.30
3	MAR_22	38	0	38	76	414	0	474	888	50834	13970	578844	52779	659372	52920	1238216	105699	11.39	12.97	24.36	1.04	1.04	2.08	10.97	12.46	11.71
4	APR_22	30	10	30	70	405	236	399	1040	50925	13274	546587	40703	840130	52399	1386717	93102	10.73	16.50	27.23	0.80	1.03	1.83	13.43	16.03	14.89
5	MAY_22	26	0	29	55	321	0	366	687	51034	14479	486648	39470	550894	43113	1037542	82583	9.54	10.79	20.33	0.77	0.84	1.62	12.33	12.78	12.56
6	JUN_22	29	20	35	84	387	405	464	1256	51144	15425	607188	45902	1338933	86133	1946121	132035	11.87	26.18	38.05	0.90	1.68	2.58	13.23	15.54	14.74
TOTAL	YEAR: JAN22-JUN22	220	30	216	466	2341	641	2672	5654	50882	83519	3281900	304237	4665316	344836	7947216	649073	64.50	91.69	156.19	5.98	6.78	12.76	10.79	13.53	12.24

TABLE-67: MONTHLY SAIDI, SAIFI, CAIDI UNDER BPDB: S&D DIVISION HALISAHAR FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	Jul-22	24	20	32	76	299	469	409	1177	51343	14577	464510	37355	1323596	79334	1788106	116689	9.05	25.78	34.83	0.73	1.55	2.27	12.44	16.68	15.32
2	Aug-22	26	0	30	56	357	0	383	740	52168	15258	525895	37685	582983	46483	1108878	84168	10.08	11.18	21.26	0.72	0.89	1.61	13.96	12.54	13.17
3	Sep-22	27	278	31	336	329	13633	417	14379	52469	48435	1621363	134606	68031015	1504453	69652378	1639059	30.90	1296.59	1327.50	2.57	28.67	31.24	12.05	45.22	42.50
4	Oct-22	42	270	44	356	505	13246	545	14296	52689	50862	2689650	221999	70051419	1608831	72741069	1830830	51.05	1329.53	1380.57	4.21	30.53	34.75	12.12	43.54	39.73
5	Nov-22	25	279	34	338	324	13312	439	14075	52689	49350	1534399	119533	68308754	1560573	69843153	1680106	29.12	1296.45	1325.57	2.27	29.62	31.89	12.84	43.77	41.57
6	Dec-22	24	0	34	58	280	0	258	538	52871	13911	392804	33845	359852	46219	752656	80064	7.43	6.81	14.24	0.64	0.87	1.51	11.61	7.79	9.40
7	Jan-23	20	144	33	197	172	8439	376	8987	53065	32266	519744	60209	28914177	574481	29433921	634690	9.79	544.88	554.68	1.13	10.83	11.96	8.63	50.33	46.38
8	Feb-23	29	151	31	211	311	9060	365	9736	53312	36399	1183521	109994	34576574	671157	35760095	781151	22.20	648.57	670.77	2.06	12.59	14.65	10.76	51.52	45.78
9	Mar-23	34	40	38	112	343	2423	474	3240	53495	13970	478871	47043	4199289	111317	4678160	158360	8.95	78.50	87.45	0.88	2.08	2.96	10.18	37.72	29.54
10	Apr_23	33	250	37	320	376	15111	399	15886	53648	34274	1329645	118060	52833216	975982	54162861	1094042	24.78	984.81	1009.60	2.20	18.19	20.39	11.26	54.13	49.51
Total	July 22-APR 23	284	1432	344	2060	3296	75693	4065	83054	52775	309302	10740402	920329	329180875	7178830	339921277	8099159	203.51	6237.45	6440.96	17.44	136.03	153.47	11.67	45.85	41.97

5.2.3.3.2 STATUS OF SAIDI, SAIFI AND CAIDI FOR S&D DIVISION KHULSHI OF BPDB, CHATTOGRAM

SAIDI:

The analysis of the collected data disclosed that the total duration of **SAIDI** for the period of January 2022 to June 2022 of S&D division Khulshi was 119.24 minutes per customer while the scheduled Load Shedding and maintenance accounted for 0.20 minutes per customer, and the unscheduled fault outages were 119.04 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 360.83 minutes per customer where the scheduled Load Shedding and maintenance counted for 264.87 minutes per customer and the unscheduled fault outages were 95.96 minutes per customer.

SAIFI:

The SAIFI of Khulshi, from January 2022 to June 2022, for unscheduled fault outages was 6.87 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 0.05 interruptions per customer. And the total SAIFI of the scheduled and unscheduled was 7.22 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for the unscheduled fault outages was 5.31 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 18.51 interruptions per customer and the result of total SAIFI for both the scheduled and unscheduled was 23.82 interruptions per customer.

CAIDI:

The CAIDI of Khulshi from January 2022 to June 2022, for the unscheduled fault outages was 17.33 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 3.69 minutes per interruption. And the total CAIDI of the scheduled and unscheduled was 16.52 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for the unscheduled fault outages was 18.06 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 14.31 minutes per interruption and the result of total CAIDI for both the scheduled and unscheduled was 15.15 minutes per interruption.

The SAIDI, SAIFI & CAIDI of Khulshi are provided in **Tables 68-69.**

TABLE-*68:* MONTHLY SAIDI, SAIFI AND CAIDI UNDER BPDB: S&D DIVISION KHULSHI FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	Jan_22	54	0	0	54	1405	0	0	1405	53450	24390	1765661	87411	0	0	1765661	88713	33.03	0.00	33.03	1.64	0.00	1.66	20.20	0.00	19.90
2	Feb_22	23	0	1	24	355	0	15	370	53368	18737	112276	14379	3975	265	116251	15112	2.10	0.07	2.18	0.27	0.00	0.28	7.81	15.00	7.69
3	Mar_22	92	0	2	94	1586	0	10	1596	53719	18258	1221024	80620	4200	1240	1225224	83420	22.73	0.08	22.81	1.50	0.02	1.55	15.15	3.39	14.69
4	Apr_22	66	0	2	68	1602	0	0	1602	54090	21872	1978235	78006	0	0	1978235	83214	36.57	0.00	36.57	1.44	0.00	1.54	25.36	0.00	23.77
5	May_22	79	0	1	80	959	0	0	959	54432	17308	1009798	76842	0	1165	1009798	82347	18.55	0.00	18.55	1.41	0.02	1.51	13.14	0.00	12.26
6	Jun_22	63	0	1	64	993	0	10	1003	52541	19137	293420	30887	2650	265	296070	33960	5.58	0.05	5.64	0.59	0.01	0.65	9.50	10.00	8.72
Total	YEAR: JAN 22-JUN 22	377	0	7	384	6900	0	35	6935	53600	119702	6380414	368145	10825	2935	6391239	386766	119.04	0.20	119.24	6.87	0.05	7.22	17.33	3.69	16.52

TABLE-*69:* MONTHLY SAIDI, SAIFI, CAIDI UNDER BPDB: S&D DIVISION KHULSHI FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	Jul-22	30	84	22	136	201	307	179	687	55643	23127	192007	34791	490445	132035	682452	166826	3.45	8.81	12.26	0.63	2.37	3.00	5.52	3.71	4.09
2	Aug-22	35	119	27	181	393	1360	249	2002	59986	23122	438339	40645	1456502	149153	1894841	189798	7.31	24.28	31.59	0.68	2.49	3.16	10.78	9.77	9.98
3	Sep-22	40	106	28	174	681	883	227	1791	60422	23122	547242	42301	904918	131714	1452160	174015	9.06	14.98	24.03	0.70	2.18	2.88	12.94	6.87	8.35
4	Oct-22	40	112	35	187	889	2325	571	3785	55579	25802	698134	40315	2523689	147756	3221823	188071	12.56	45.41	57.97	0.73	2.66	3.38	17.32	17.08	17.13
5	Nov-22	18	47	11	76	267	467	165	899	57782	24347	170868	12236	443750	44201	614618	56437	2.96	7.68	10.64	0.21	0.76	0.98	13.96	10.04	10.89
6	Dec-22	39	91	21	151	459	1009	261	1729	80917	32437	471600	49580	1516035	167220	1987635	216800	5.83	18.74	24.56	0.61	2.07	2.68	9.51	9.07	9.17
7	Jan-23	75	131	29	235	2297	4776	853	7926	80917	32437	2440241	105505	5865712	247641	8305953	353146	30.16	72.49	102.65	1.30	3.06	4.36	23.13	23.69	23.52
8	Feb-23	21	65	7	93	307	337	85	729	81917	32296	194332	11955	390746	122109	585078	134064	2.37	4.77	7.14	0.15	1.49	1.64	16.26	3.20	4.36
9	Mar-23	94	139	25	258	663	531	183	1377	81917	1377	75542	8194	60267	8343	135809	16537	0.92	0.74	1.66	0.10	0.10	0.20	9.22	7.22	8.21
10	Apr_23	21	130	0	151	745	4052	381	5178	81917	32246	1460034	24900	4809020	139916	6269054	164816	17.82	58.71	76.53	0.30	1.71	2.01	58.64	34.37	38.04
Total	July 22-APR 23	413	1024	205	1642	6902	16047	3154	26103	69700	250313	6688339	370422	18461084	1290088	25149423	1660510	95.96	264.87	360.83	5.31	18.51	23.82	18.06	14.31	15.15

5.2.3.3.3 STATUS OF SAIDI, SAIFI AND CAIDI FOR S&D DIVISION AGRABAD OF BPDB, CHATTOGRAM

SAIDI:

The analysis of the collected data unveiled that the total duration of SAIDI for the period of January 2022 to June 2022 of S&D division Agrabad was 24.17 minutes per customer, while the scheduled Load Shedding and maintenance accounted for 13.96 minutes per customer, and the unscheduled fault outages were 10.21 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 166.75 minutes per customer where the scheduled Load Shedding and maintenance counted for 153.71 minutes per customer and the unscheduled fault outages were 13.04 minutes per customer.

SAIFI:

The SAIFI of Agrabad, from January 2022 to June 2022, for the unscheduled fault outages was 0.34 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 0.82 interruptions per customer. And the total SAIFI of the scheduled and unscheduled was 1.15 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for the unscheduled fault outages was 0.56 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 5.66 interruptions per customer and the result of total SAIFI for both the scheduled and unscheduled was 6.22 interruptions per customer.

CAIDI:

The CAIDI of Agrabad from January 2022 to June 2022, for the unscheduled fault outages was 30.27 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 17.09 minutes per interruption. And the total CAIDI of the scheduled and unscheduled was 20.94 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for the unscheduled fault outages was 23.10 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 27.16 minutes per interruption and the result of total CAIDI for both the scheduled and unscheduled was 26.79 minutes per interruption.

The SAIDI, SAIFI & CAIDI of Agrabad are provided in **Tables-70 to 71.**

TABLE-70: MONTHLY SAIDI, SAIFI, CAIDI UNDER BPDB: S&D DIVISION AGRABAD FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	Jan_22	11	0	34	45	535	0	708	1243	55760	2686	146423	2976	154548	7786	300971	10762	2.63	2.77	5.40	0.05	0.14	0.19	49.20	19.85	27.97
2	Feb_22	16	0	33	49	468	0	642	1110	56019	2618	95752	3982	160847	6477	256599	10459	1.71	2.87	4.58	0.07	0.12	0.19	24.05	24.83	24.53
3	Mar_22	10	0	28	38	385	0	487	872	56193	2618	104260	2498	115775	5492	220035	7990	1.86	2.06	3.92	0.04	0.10	0.14	41.74	21.08	27.54
4	Apr_22	12	0	27	39	257	0	433	690	56193	2618	56350	2558	95662	5364	152012	7922	1.00	1.70	2.71	0.05	0.10	0.14	22.03	17.83	19.19
5	May_22	14	0	67	81	415	0	652	1067	56193	2728	120373	4330	146994	15002	267367	19332	2.14	2.62	4.76	0.08	0.27	0.34	27.80	9.80	13.83
6	Jun_22	9	0	23	32	200	0	474	674	56730	2728	50534	2609	110655	5794	161189	8403	0.89	1.95	2.84	0.05	0.10	0.15	19.37	19.10	19.18
Total	YEAR: JAN 22-JUN 22	72	0	212	284	2260	0	3396	5656	56181	15996	573692	18953	784481	45915	1358173	64868	10.21	13.96	24.17	0.34	0.82	1.15	30.27	17.09	20.94

TABLE-71: MONTHLY SAIDI, SAIFI, CAIDI UNDER BPDB: S&D DIVISION AGRABAD FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JUL-22	10	41	60	111	304	1229	852	2385	56846	2714	84173	2661	479817	22469	563990	25130	1.48	8.44	9.92	0.05	0.40	0.44	31.63	21.35	22.44
2	AUG-22	12	59	60	131	253	1526	969	2748	57050	2714	66295	2717	568345	27160	634640	29877	1.16	9.96	11.12	0.05	0.48	0.52	24.40	20.93	21.24
3	SEP-22	12	174	54	240	276	7233	765	8274	57300	2681	58307	2468	1725520	42948	1783827	45416	1.02	30.11	31.13	0.04	0.75	0.79	23.63	40.18	39.28
4	OCT-22	11	263	54	328	289	12944	776	14009	57741	2681	77472	2923	3067179	71091	3144651	74014	1.34	53.12	54.46	0.05	1.23	1.28	26.50	43.14	42.49
5	NOV-22	9	52	66	127	300	1460	677	2437	57741	2928	85922	2512	521784	29659	607706	32171	1.49	9.04	10.52	0.04	0.51	0.56	34.20	17.59	18.89
6	DEC-22	16	32	55	103	348	1020	749	2117	57905	2928	77553	3373	459437	23088	536990	26461	1.34	7.93	9.27	0.06	0.40	0.46	22.99	19.90	20.29
7	JAN-23	16	62	56	134	412	1362	777	2551	58321	2969	98495	3526	524382	29812	622877	33338	1.69	8.99	10.68	0.06	0.51	0.57	27.93	17.59	18.68
8	FEB-23	17	45	46	108	296	1049	647	1992	58303	2907	63728	3464	402935	21689	466663	25153	1.09	6.91	8.00	0.06	0.37	0.43	18.40	18.58	18.55
9	MAR-23	18	77	59	154	233	1600	763	2596	58396	2945	54449	4303	583746	34194	638195	38497	0.93	10.00	10.93	0.07	0.59	0.66	12.65	17.07	16.58
10	APR_23	20	57	53	130	396	1461	916	2773	58552	2736	87321	4684	553772	25130	641093	29814	1.49	9.46	10.95	0.08	0.43	0.51	18.64	22.04	21.50
Total	JULY22-APR23	141	862	563	1566	3107	30884	7891	41882	57816	28203	753715	32631	8886917	327240	9640632	359871	13.04	153.71	166.75	0.56	5.66	6.22	23.10	27.16	26.89

5.2.3.3.4 SUMMARY OF BPDB- HALISAHAR, KHULSHI, AND AGRABAD ARE GIVEN BELOW BASED ON THE TABLE-66 TO 71

The target of SAIDI and SAIFI during the financial year 2021-2022 was 745 minutes per customer and 45 interruptions per customer and for the financial year 2022-2023, it was set at 1240 minutes per customer and 45 interruptions per customer as Key Performance Indicators (KPIs). Under the selected three S&D divisions, the average SAIFI was 6.85 interruptions per customer and SAIDI was 97.70 minutes per customer for the 6-month period from January to June 2022.

The average SAIDI and SAIFI for the 10-month period from July 2022 to April 2023 were 2078.38 minutes per customer and 56.13 interruptions per customer. The average SAIDI and SAIFI due to fault outage were 100.85 minutes per customer and 7.34 interruptions per customer, which were within the target set up by the power cell. NLDC imposed forced the load shedding due to generation and transmission limitations, particularly from July 2023 to November 2023.

SAIDI and SAIFI due to force the load shedding were 1977.53 minutes per customer and 48.79 interruptions per customer. The summary of average SAIDI, SAIFI, and CAIDI for three divisional offices under BPDB is presented in **Table-72 and Table-73**, illustrating the data for FY 2021-2022 and FY 2022-2023, respectively.

Following July 2022, there has been an increase in the calculated values of the SAIDI and SAIFI during scheduled outages, primarily due to limitations in generation and transmission. Since July 2022, there has been a notable escalation in the computed the values of SAIDI and SAIFI during scheduled outages, primarily attributed to constraints in generation and transmission capabilities.

TABLE-72: SUMMARY FOR THE MONTH OF JANUARY2022 - JUNE 2022 (FY 2021-2022)
BPDB: AVERAGE SAIDI SAIFI AND CAIDI OF NOCS AGRABAD, KHULSHI AND HALISAHAR

Name of the Division	Name of the year	Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
				Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
AGRABAD	YEAR: JAN - JUN 2022	56181	15996	573692	18953	784481	45915	1358173	64868.00	10.21	13.96	24.17	0.34	1.15	1.15	30.27	17.09	20.94
KHULSHI	YEAR: JAN - JUN 2022	53600	119702	6380414	368145	10825	2935	6391239	386766.00	119.04	0.20	119.24	6.87	0.05	7.22	17.33	3.69	16.52
HALISAHAR	YEAR: JAN22-JUN22	50882	83519	3281900	304237	4665316	344836	7947216	649073	64.50	91.69	156.19	5.98	6.78	12.76	10.79	13.53	12.24
TOTAL	YEAR: JAN22-JUN22	160663	219217	10236006	691335	5460622	393686	15696628	1100707	63.71	33.99	97.70	4.30	2.45	6.85	14.81	13.87	14.26

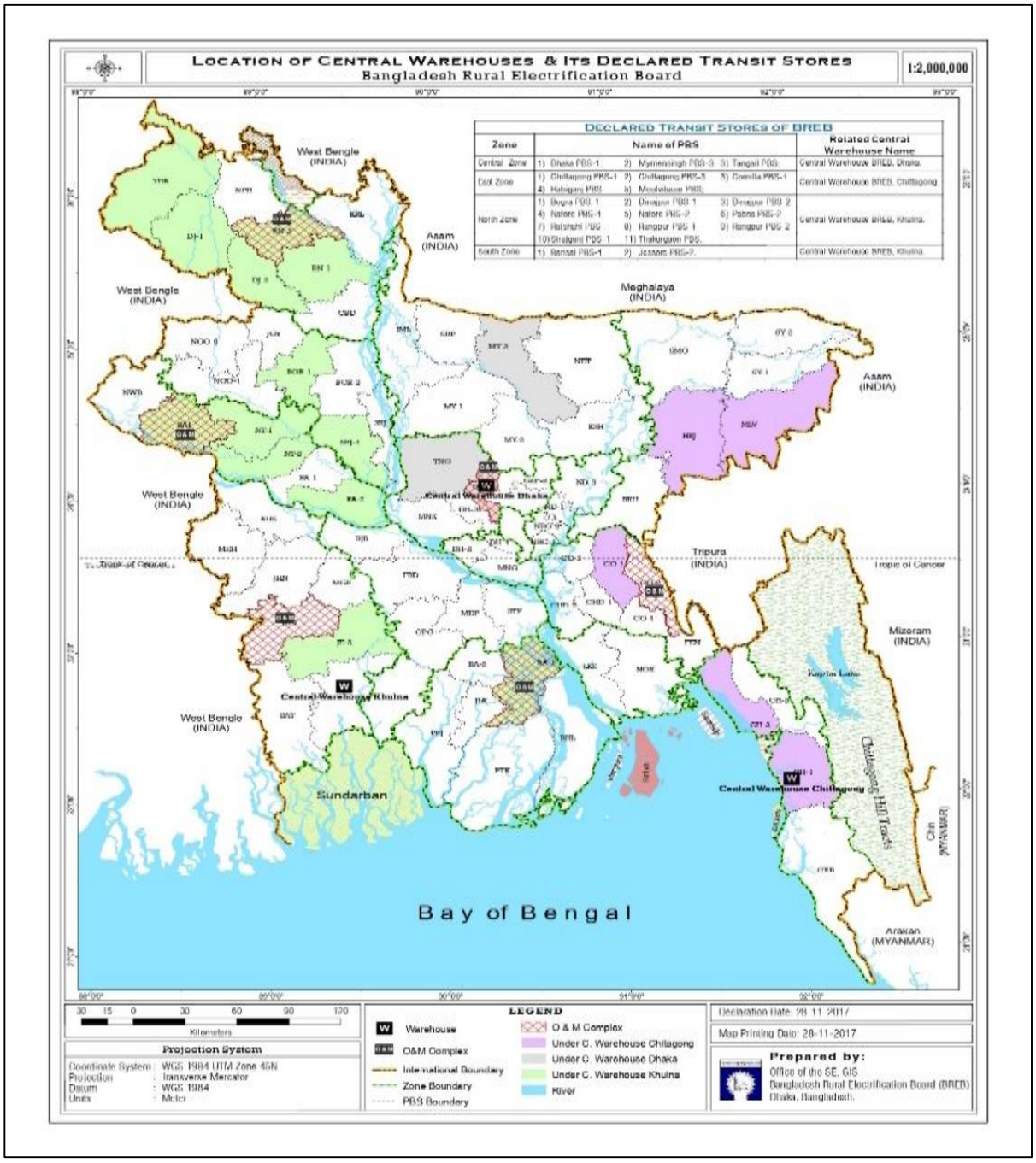
TABLE-73: SUMMARY FOR THE MONTH OF JULY2022- APRIL2023 (FY 2022-2023)
BPDB: AVERAGE SAIDI SAIFI AND CAIDI OF NOCSAGRABAD, KHULSHI AND HALISAHAR

Name of the Division	Name of the year	Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
				Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
AGRABAD	YEAR: JUL22-APR23	57816	28203	753715	32631	8886917	327240	9640632	359871.00	13. 04	153.71	166.75	0.56	5.66	6.22	23.10	27.16	26.79
KHULSHI	YEAR: JUL22-APR23	69700	250313	6688339	370422	18461084	1290088	25149423	1660510.00	95.96	264.87	360.83	5.31	18.51	23.82	18.06	14.31	15.15
HALISAHAR	YEAR: JUL22-APR23	52775	309302	10740402	920329	329180875	7178830	339921277	8099159	203.51	6237.45	6440.96	17.44	136.03	153.47	11.67	45.85	41.97
TOTAL	YEAR: JUL22-APR23	180290	587818	18182456	1323382	356528876	8796158	374711332	10119540	100.85	1977.53	2078.38	7.34	48.79	56.13	13.74	40.53	37.03

5.2.3.4 Bangladesh Rural Development Board (BREB)

Narayanganj PBS-1 and Mymensingh PBS-1 have provided the interruption data from their automated system-generated sheet for the period of January to June 2022 and July to April 2023. Computation of the interruption data on a monthly feeder-wise basis. Feeder-wise SAIDI, SAIFI, and CAIDI have been calculated for each month, which summarized monthly SAIDI, SAIFI, and CAIDI data for FY 2021-2022 and FY 2022-2023. The month-wise SAIDI, SAIFI, and CAIDI values for PBS-Narayanganj and PBS-1 Mymensingh are provided in **Figure-55** below:

FIGURE-55: BREB GEOGRAPHICAL AREA MAP



5.2.3.4.1 STATUS OF SAIDI, SAIFI AND CAIDI FOR PBS-1 DIVISION NARAYANGANJ OF BREB

SAIDI:

The analysis of the collected data unveiled that the total duration of SAIDI for the period of January 2022 to June 2022 of PBS-1 Narayanganj was 2835.28 minutes per customer, while the scheduled Load Shedding and maintenance accounted for 2455.55 minutes per customer, and the unscheduled fault outages were 379.73 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 4314.01 minutes per customer, where the scheduled Load Shedding and maintenance counted for 3699.51 minutes per customer and the unscheduled fault outages were 614.51 minutes per customer.

SAIFI:

The SAIFI of PBS-1 Narayanganj, from January 2022 to June 2022, for the unscheduled fault outages was 17.11 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 82.55 interruptions per customer. And the total SAIFI of the scheduled and unscheduled was 99.66 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for unscheduled fault outages was 28.78 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 98.69 interruptions per customer and the result of total SAIFI for both the scheduled and unscheduled was 127.47 interruptions per customer.

CAIDI:

The CAIDI of PBS-1 Narayanganj from January 2022 to June 2022, for the unscheduled fault outages was 22.20 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 29.75 minutes per interruption. And the total CAIDI of scheduled and unscheduled was 28.45 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for unscheduled fault outages was 21.35 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 37.49 minutes per interruption and the result of total CAIDI for both the scheduled and unscheduled was 33.84 minutes per interruption.

The SAIDI, SAIFI & CAIDI of PBS-1 Narayanganj are provided in **Tables 74-75.**

TABLE-74: MONTHLY SAIDI, SAIFI, CAIDI UNDER BREB PBS-1 NARAYANGANJ FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JAN_22	120	252	275	647	2758	9808	7363	19930	321005	321005	11888277	493480	59039999	1879909	70928276	2373389	37.03	183.92	220.96	1.54	5.86	7.39	24.09	31.41	29.88
2	FEB_22	171	378	413	962	3983	16333	11864	32180	321005	321005	17350882	702263	97227116	2823074	114577997	3525337	54.05	302.88	356.94	2.19	8.79	10.98	24.71	34.44	32.50
3	MAR_22	197	1998	300	2494	1543	19055	13841	34440	321005	321005	5469662	826010	113431635	8150371	118901297	8976380	17.04	353.36	370.40	2.57	25.39	27.96	6.62	13.92	13.25
4	APR_22	248	260	528	1037	5829	24420	17796	48045	321005	321005	25384364	1026718	145840516	2824044	171224880	3850762	79.08	454.32	533.40	3.20	8.80	12.00	24.72	51.64	44.47
5	MAY_22	297	694	757	1748	7149	29944	21751	58844	321005	321005	31167974	1222760	178249712	5175637	209417686	6398397	97.09	555.29	652.38	3.81	16.12	19.93	25.49	34.44	32.73
6	JUN_22	294	757	825	1876	6908	32666	23728	63302	321005	321005	30635113	1220324	194454232	5646149	225089344	6866473	95.44	605.77	701.20	3.80	17.59	21.39	25.10	34.44	32.78
Total	YEAR: JAN 22-JUN 22	1327	4339	3097	8764	28170	132226	96344	256740	321005	1926030	121896272	5491555	788243210	26499184	910139481	31990738	379.73	2455.55	2835.28	17.11	82.55	99.66	22.20	29.75	28.45

TABLE-75: MONTHLY SAIDI, SAIFI, CAIDI UNDER BREB PBS-1 NARAYANGANJ FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JUL-22	391	820	894	2105	7732	35388	25705	68825	321005	321005	33803138	1606867	210658751	6116661	244461889	7723528	105.30	656.25	761.55	5.01	19.05	24.06	21.04	34.44	31.65
2	AUG-22	304	631	688	1622	6658	27222	19773	53653	321005	321005	28918156	1259133	162045193	4705124	190963349	5964257	90.09	504.81	594.89	3.92	14.66	18.58	22.97	34.44	32.02
3	SEP-22	291	599	654	1543	6850	25861	18785	51495	321556	321556	28982467	1198382	154080863	4477406	183063329	5675788	90.13	479.17	569.30	3.73	13.92	17.65	24.18	34.41	32.25
4	OCT-22	229	473	516	1218	5270	20416	14830	40516	331754	331754	22882540	967803	124834081	3646911	147716621	4614714	68.97	376.29	445.26	2.92	10.99	13.91	23.64	34.23	32.01
5	NOV-22	153	315	344	812	3358	13611	9887	26855	321646	321646	14475141	630622	81107048	2357177	95582189	2987799	45.00	252.16	297.17	1.96	7.33	9.29	22.95	34.41	31.99
6	DEC-22	139	284	310	732	3451	12250	8898	24599	321005	321005	14457746	569736	72920337	2117306	87378083	2687042	45.04	227.16	272.20	1.77	6.60	8.37	25.38	34.44	32.52
7	JAN-23	210	423	396	1029	2541	25401	6162	34104	321005	321005	11182038	816290	112540965	2928877	123723004	3745166	34.83	350.59	385.42	2.54	9.12	11.67	13.70	38.42	33.04
8	FEB-23	135	287	322	744	3706	17242	11434	32381	321005	321005	16327087	491045	102077204	2181064	118404290	2672110	50.86	317.99	368.85	1.53	6.79	8.32	33.25	46.80	44.31
9	MAR-23	218	271	230	718	2828	16235	13540	32604	321005	321005	9933281	853928	104839901	1737206	114773182	2591134	30.94	326.60	357.54	2.66	5.41	8.07	11.63	60.35	44.29
10	APR_23	212	228	200	641	4185	13700	5051	22937	321005	321005	17032287	879891	66873043	1529674	83905331	2409565	53.06	208.32	261.38	2.74	4.77	7.51	19.36	43.72	34.82
TOTAL	JULY 22 - APR 23	2282	4331	4552	11165	46578	207325	134066	387969	322199	3221991	197993881	9273696	1191977386	31797407	1389971266	41071103	614.51	3699.51	4314.01	28.78	98.69	127.47	21.35	37.49	33.84

5.2.3.4.2 STATUS OF SAIDI, SAIFI AND CAIDI FOR PBS-1 DIVISION MYMENSINGH OF BREB

SAIDI:

The analysis of the collected data unveiled that the total duration of SAIDI for the period of January 2022 to June 2022 of PBS-1 Mymensingh was 3825.03 minutes per customer, while the scheduled Load Shedding and maintenance accounted for 2667.77 minutes per customer, and the unscheduled fault outages were1157.27 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 6027.24 minutes per customer, where the scheduled Load Shedding and maintenance counted for 4207.87 minutes per customer and the unscheduled fault outages were 1819.37 minutes per customer.

SAIFI:

The SAIFI of PBS-1 Mymensingh, from January 2022 to June 2022, for the unscheduled fault outages was 57.86 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 133.39 interruptions per customer. And the total SAIFI of scheduled and unscheduled was 191.25 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for unscheduled fault outages was 90.97 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 210.39 interruptions per customer and the result of total SAIFI for both scheduled and unscheduled was 301.36 interruptions per customer.

CAIDI:

The CAIDI of PBS-1 Mymensingh, from January 2022 to June 2022, for the unscheduled fault outages was 20.00 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 20.00 minutes per interruption. And the total CAIDI of scheduled and unscheduled was 20.00 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for unscheduled fault outages was 20.00 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 20.00 minutes per interruption and the result of the total CAIDI for both scheduled and unscheduled was 20.00 minutes per interruption.

The SAIDI, SAIFI & CAIDI of PBS-1 Mymensingh, are provided in **Tables 76-77.**

TABLE-76: MONTHLY SAIDI, SAIFI AND CAIDI UNDER BREB PBS-1 MYMENSINGH FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	Jan_22	546	0	1197	1743	10920	0	23940	34860	360506	360506	70537060	3526853	160247720	8012386	230784780	11539239	195.66	444.51	640.17	9.78	22.23	32.01	20.00	20.00	20.00
2	Feb_22	531	0	1157	1688	10620	0	23140	33760	360506	360506	67742560	3387128	154275780	7713789	222018340	11100917	187.91	427.94	615.85	9.40	21.40	30.79	20.00	20.00	20.00
3	Mar_22	529	0	1204	1733	10580	0	24080	34660	360506	360506	66609460	3330473	155917340	7795867	222526800	11126340	184.77	432.50	617.26	9.24	21.62	30.86	20.00	20.00	20.00
4	Apr_22	584	0	1304	1888	11680	0	26080	37760	360506	360506	72712580	3635629	167309680	8365484	240022260	12001113	201.70	464.10	665.79	10.08	23.20	33.29	20.00	20.00	20.00
5	May_22	609	0	1299	1908	12180	0	25980	38160	360506	360506	75063180	3753159	166536680	8326834	241599860	12079993	208.22	461.95	670.17	10.41	23.10	33.51	20.00	20.00	20.00
6	Jun_22	510	0	1253	1763	10200	0	25060	35260	360506	360506	64537080	3226854	157458820	7872941	221995900	11099795	179.02	436.77	615.79	8.95	21.84	30.79	20.00	20.00	20.00
Total	JAN 22 - JUN 22	3309	0	7414	10723	66180	0	148280	214460	360506	2163036	417201920	20860096	961746020	48087301	1378947940	68947397	1157.27	2667.77	3825.03	57.86	133.39	191.25	20.00	20.00	20.00

TABLE-77: MONTHLY SAIDI, SAIFI, CAIDI UNDER BREB PBS-1 MYMENSINGH FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JUL-22	522	0	1146	1668	10440	0	22920	33360	360506	360506	66921540	3346077	151378060	7568903	218299600	10914980	185.63	419.90	605.54	9.28	21.00	30.28	20.00	20.00	20.00
2	AUG-22	552	0	1237	1789	11040	0	24740	35780	360506	360506	67969920	3398496	156924260	7846213	224894180	11244709	188.54	435.29	623.83	9.43	21.76	31.19	20.00	20.00	20.00
3	SEP-22	489	0	1279	1768	9780	0	25580	35360	360506	360506	62123180	3106159	160164720	8008236	222287900	11114395	172.32	444.28	616.60	8.62	22.21	30.83	20.00	20.00	20.00
4	OCT-22	576	0	1295	1871	11520	0	25900	37420	360506	360506	72120040	3606002	165788560	8289428	237908600	11895430	200.05	459.88	659.93	10.00	22.99	33.00	20.00	20.00	20.00
5	NOV-22	479	0	1088	1567	9580	0	21760	31340	360506	360506	61431080	3071554	144264000	7213200	205695080	10284754	170.40	400.17	570.57	8.52	20.01	28.53	20.00	20.00	20.00
6	DEC-22	418	0	1020	1438	8360	0	20400	28760	360506	360506	54299960	2714998	135664880	6783244	189964840	9498242	150.62	376.32	526.94	7.53	18.82	26.35	20.00	20.00	20.00
7	JAN-23	555	0	1171	1726	11100	0	23420	34520	360862	360862	69606260	3480313	150029960	7501498	219636220	10981811	192.89	415.75	608.64	9.64	20.79	30.43	20.00	20.00	20.00
8	FEB-23	490	0	1157	1647	9800	0	23140	32940	360862	360862	62551540	3127577	154436420	7721821	216987960	10849398	173.34	427.97	601.30	8.67	21.40	30.07	20.00	20.00	20.00
9	MAR-23	602	0	1131	1733	12040	0	22620	34660	360862	360862	74602060	3730103	142230140	7111507	216832200	10841610	206.73	394.14	600.87	10.34	19.71	30.04	20.00	20.00	20.00
10	APR_23	511	0	1185	1696	10220	0	23700	33920	360862	360862	64529040	3226452	156679480	7833974	221208520	11060426	178.82	434.18	613.00	8.94	21.71	30.65	20.00	20.00	20.00
TOTAL	JULY 22-APR 23	5194	0	11709	16903	103880	0	234180	338060	360648	3606484	656154620	32807731	1517560480	75878024	2173715100	108685755	1819.37	4207.87	6027.24	90.97	210.39	301.36	20.00	20.00	20.00

5.2.3.4.3 SUMMARY OF BREB-PBS-NARAYANGANJ AND PBS-1 MYMENSINGH ARE GIVEN BELOW BASED ON THE TABLE-74 TO 77

Power Cell has set the SAIDI and SAIFI targets for BREB as KPIs. For the financial year 2021-2022, the target for SAIDI was set at 1250 minutes per customer, and the target for SAIFI was set at 42 interruptions per customer.

Consecutively, for a period of 6 months (January 2022 to June 2022). The average SAIDI and SAIFI in the selected two PBS divisions during the financial year 2022-2023 were 3358.84 minutes per customer and 148.11 interruptions per customer. Respectively, for a period of 10 months (July 2022 to April 2023).

It is mentioned that the target for SAIDI and SAIFI during the financial year 2022-2023 was 1760 minutes per customer and 50 interruptions per customer as KPI. Moreover, the average SAIDI and SAIFI resulting from fault outages were 1250.86 minutes per customer and 61.63 interruptions per customer thereafter, which is within the target set up by Power Cell. NLDC implemented forced load shedding due to generation and transmission limitations, particularly from July 2023 to November 2023.The SAIDI and SAIFI values resulting from forced load shedding were 3968.00 minutes per customer and 157.69 interruptions per customer, respectively.

The SAIDI, SAIFI, and CAIDI values for the two PBS under BREB during the periods of January 2022 to June 2022 and July 2022 to April 2023 are provided in the table and graph below. SAIDI, SAIFI, and CAIDI values resulting from unscheduled (fault outage) and scheduled (load shedding and scheduled maintenance) events are separately calculated. Following July 2022, there is an increase in SAIDI and SAIFI during scheduled outages due to generation and transmission limitations. A summary of the average SAIDI, SAIFI, and CAIDI values for the two PBS under BREB is depicts in **Tables-78 and 79** for the FY 2021-2022 and 2022-2023

TABLE-78: SUMMARY FOR THE MONTH OF JANUARY2022 - JUNE 2022 (FY 2021-2022)
BREB: AVERAGE SAIDI SAIFI AND CAIDI OF PBS-1 MYMENSINGH AND PBS-1 NARAYANGANJ

Name of the Division	Name of the year	Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
				Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
MYMENSINGH PBS-1	YEAR: JAN - JUN 2022	360506	2163036	417201920	20860096	961746020	48087301	1378947940	68947397	1157.27	2667.77	3825.03	57.86	133.39	191.25	20.00	20.00	20.00
NARAYANGANJ PBS-1	YEAR: JAN 22-JUN 22	321005	1926030	121896272	5491554.6	788243209.8	26499183.6	910139481.5	31990738.2	379.73	2455.55	2835.28	17.11	82.55	99.66	22.20	29.75	28.45
TOTAL	YEAR: JAN22-JUN22	681511	4089066	539098192	26351650.6	1749989230	74586484.6	2289087421	100938135	791.03	2567.81	3358.84	38.67	109.44	148.11	20.46	23.46	22.68

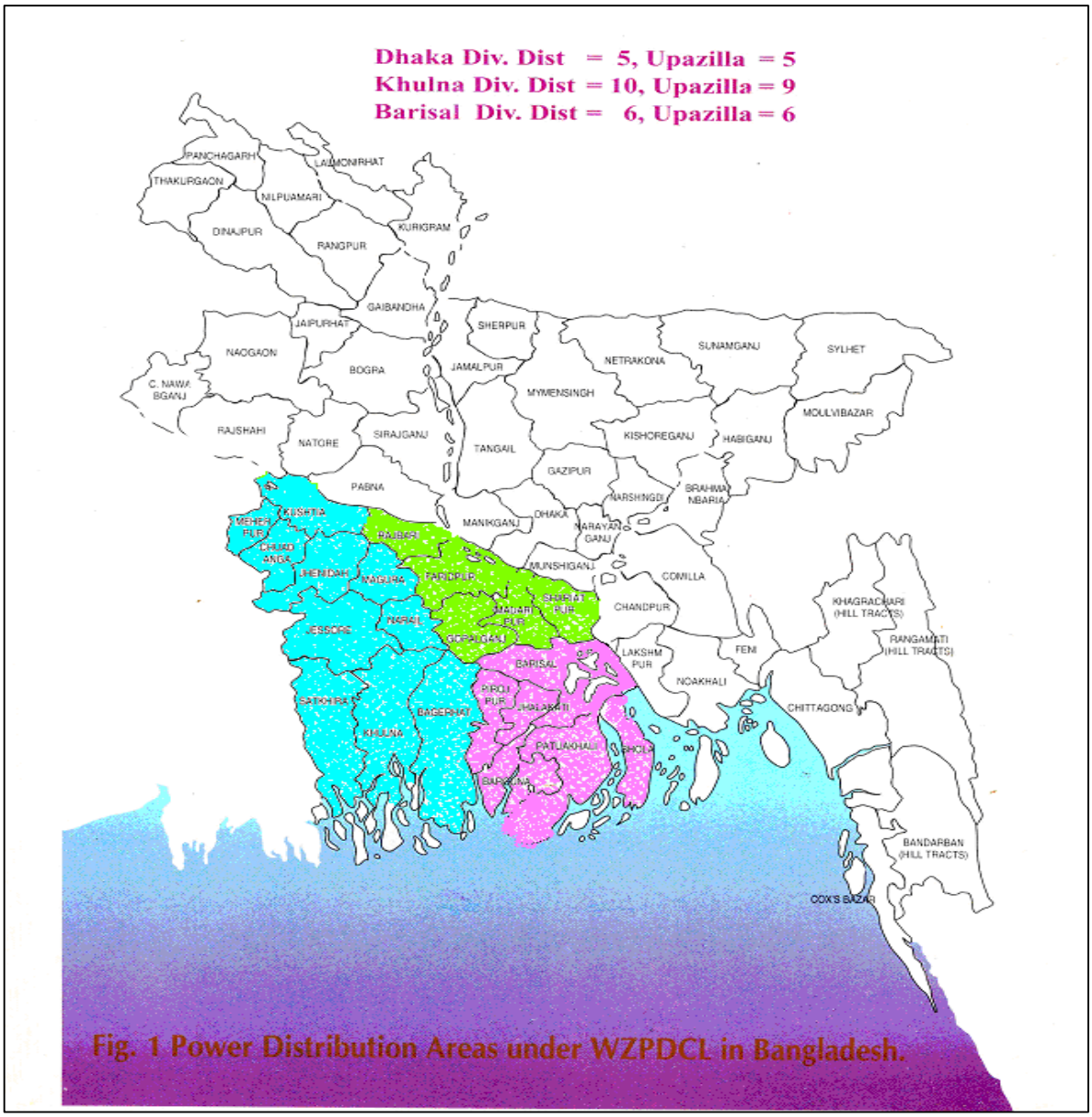
TABLE-79: SUMMARY FOR THE MONTH OF JULY2022- APRIL2023 (FY 2022-2023)
BREB: AVERAGE SAIDI SAIFI AND CAIDI OF PBS-1 MYMENSINGH AND PBS-1 NARAYANGANJ

Name of the Division	Name of the year	Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
				Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
MYMENSINGH PBS-1	YEAR: JUL 22-APR 23	360648	3606484	656154620	32807731	1517560480	75878024	2173715100	108685755	1819.37	4207.9	6027.24	90.97	210.39	301.36	20.00	20.00	20.00
NARAYANGANJ PBS-1	YEAR: JUL 22-APR 23	322199	3221991	197993881	9273696.35	1191977386	31797406.6	1389971266	41071102.91	614.51	3699.51	4314.01	28.78	98.69	127.47	21.35	37.49	33.84
TOTAL	YEAR: JUL 22-APR 23	682848	6828475	854148501	42081427.4	2709537866	107675431	3563686366	149756857.9	1250.86	3968.00	5218.86	61.63	157.69	219.31	20.30	25.16	23.80

5.2.3.5 West Zone Power Distribution Company Ltd. (WZPDCL)

Data has been collected from Khulna S&D Division-3 and Satkhira S&D Division within WZPDCL. Interruption data was collected from Khulna S&D Division-3 and Satkhira S&D Division for the periods of January to June 2022 and July to April 2023.The monthly feeder-wise interruption data for the periods of January to June 2022 and July to April 2023 was computed and analysed. This analysis involved the calculation of feeder-wise SAIDI, SAIFI, and CAIDI for the S&D Division of Khulna-3 and Satkhira. Below, illustrate the month-wise SAIDI, SAIFI, and CAIDI values for Khulna S&D Division-3 and Satkhira S&D Division, as provided in **table 80 to table 83 and figure-56**. The summarized monthly SAIDI, SAIFI, and CAIDI report for FY 2021-2022 and FY 2022-2023 is provided below. These tables present a concise overview of the SAIDI, SAIFI, and CAIDI values for each month throughout the specified financial years.

FIGURE-56: WZPDCL GEOGRAPHYCAL AREA MAP



5.2.3.5.1 STATUS OF SAIDI, SAIFI AND CAIDI FOR S&D-3 DIVISION, KHULNA OF WZPDCL

SAIDI:

The analysis of the collected data unveiled that the total duration of SAIDI for the period of January 2022 to June 2022 of S&D division Khulna-3 was 998.07 minutes per customer, while the scheduled Load Shedding and maintenance accounted for 705.02 minutes per customer, and the unscheduled fault outages were 293.05 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 1799.16 minutes per customer, where the scheduled Load Shedding and maintenance counted for 1332.91 minutes per customer and the unscheduled fault outages were 466.25 minutes per customer.

SAIFI:

The SAIFI of S&D Division Khulna-3 from January 2022 to June 2022, for unscheduled fault outages was 26.21 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 53.77 interruptions per customer. And the total SAIFI of scheduled and unscheduled was 79.98 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for unscheduled fault outages was 39.64 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 96.83 interruptions per customer and the result of total SAIFI for both the scheduled and unscheduled was 136.47 interruptions per customer.

CAIDI:

The CAIDI of S&D Division Khulna-3 from January 2022 to June 2022, for the unscheduled fault outages was 11.18 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 13.11 minutes per interruption. And the total CAIDI of scheduled and unscheduled was 12.48 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for unscheduled fault outages was 11.76 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 13.77 minutes per interruption and the result of total CAIDI for both scheduled and unscheduled was 13.18 minutes per interruption.

The SAIDI, SAIFI & CAIDI of S&D Division Khulna-3 are provided in **Table-80 to 81.**

TABLE-80: MONTHLY SAIDI, SAIFI, CAIDI UNDER WZPDCL: S&D DIVISION KHULNA-3 FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JAN_22	17	0	54	71	109	0	360	469	42169	42169	723076	109679	2228216	331281	2951292	440960	17.15	52.84	69.99	2.60	7.86	10.46	6.59	6.73	6.69
2	FEB_22	20	0	49	69	173	0	448	621	42270	42270	1128018	129337	2798668	309717	3926686	439054	26.69	66.21	92.90	3.06	7.33	10.39	8.72	9.04	8.94
3	MAR_22	25	0	55	80	264	0	429	693	42372	42372	1745177	162870	2637344	348838	4382521	511708	41.19	62.24	103.43	3.84	8.23	12.08	10.72	7.56	8.56
4	APR_22	25	0	55	80	264	0	429	693	42508	42508	1750495	163388	2645709	349921	4396204	513309	41.18	62.24	103.42	3.84	8.23	12.08	10.71	7.56	8.56
5	MAY_22	44	0	40	84	565	0	167	732	42633	42633	3611267	297937	1054944	251247	4666211	549184	84.71	24.74	109.45	6.99	5.89	12.88	12.12	4.20	8.50
6	JUN_22	37	61	50	148	535	2750	273	3558	42783	42783	3483624	249416	18567313	692009	22050937	941425	81.43	433.99	515.41	5.83	16.17	22.00	13.97	26.83	23.42
Total	JAN22-JUN22	168	61	303	532	1910	2750	2106	6766	42456	254735	12441657	1112627	29932194	2283013	42373851	3395640	293.05	705.02	998.07	26.21	53.77	79.98	11.18	13.11	12.48

TABLE-81: MONTHLY SAIDI, SAIFI, CAIDI UNDER WZPDCL: S&D DIVISION KHULNA-3FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JUL-22	21	45	38	104	340	2028	263	2631	42934	42934	2329523	144066	14148635	516014	16478158	660080	54.26	329.54	383.80	3.36	12.02	15.37	16.17	27.42	24.96
2	AUG-22	33	47	31	111	403	1938	232	2573	43062	43062	2665487	221156	13520954	489437	16186441	710593	61.90	313.99	375.89	5.14	11.37	16.50	12.05	27.63	22.78
3	SEP-22	36	55	33	124	443	1593	107	2143	43202	43202	2955039	245667	10615392	553471	13570431	799138	68.40	245.72	314.12	5.69	12.81	18.50	12.03	19.18	16.98
4	OCT-22	34	60	30	124	462	0	94	556	43328	43328	3123687	230135	596019	566670	3719706	796805	72.09	13.76	85.85	5.31	13.08	18.39	13.57	1.05	4.67
5	NOV-22	18	0	57	75	242	0	376	618	43440	43440	1602056	118427	2378082	359748	3980138	478175	36.88	54.74	91.62	2.73	8.28	11.01	13.53	6.61	8.32
6	DEC-22	18	0	59	77	223	0	1261	1484	43582	43582	1556767	117952	6303521	339409	7860288	457361	35.72	144.64	180.36	2.71	7.79	10.49	13.20	18.57	17.19
7	JAN-23	15	0	54	69	133	0	360	493	43701	43701	901143	101880	2303487	343264	3204630	445144	20.62	52.71	73.33	2.33	7.85	10.19	8.85	6.71	7.20
8	FEB-23	21	0	49	70	194	0	424	618	43819	43819	1291572	138471	2738036	320868	4029608	459339	29.48	62.49	91.96	3.16	7.32	10.48	9.33	8.53	8.77
9	MAR-23	28	0	55	83	268	0	416	684	43917	43917	1837704	190110	2660030	361204	4497734	551314	41.84	60.57	102.41	4.33	8.22	12.55	9.67	7.36	8.16
10	APR_23	32	0	55	87	297	0	425	722	44023	44023	2019228	216602	2718436	362074	4737664	578676	45.87	61.75	107.62	4.92	8.22	13.14	9.32	7.51	8.19
Total	JULY22-APR23	256	207	461	924	3005	5559	3958	12522	43501	435008	20282206	1724466	57982592	4212159	78264798	5936625	466.25	1332.91	1799.16	39.64	96.83	136.47	11.76	13.77	13.18

5.2.3.5.2 STATUS OF SAIDI, SAIFI AND CAIDI FOR S&D DIVISION, SATKHIRA OF WZPDCL

SAIDI:

The analysis of the collected data disclosed that the total duration of SAIDI for the period of January 2022 to June 2022 of S&D division Satkhira was 2542.53 minutes per customer, while the scheduled Load Shedding and maintenance accounted for 2300.46 minutes per customer, and the unscheduled fault outages were 242.07 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 8136.90 minutes per customer, where the scheduled Load Shedding and maintenance counted for 7731.80 minutes per customer and the unscheduled fault outages were 405.10 minutes per customer.

SAIFI:

The SAIFI of S&D division Satkhira from January 2022 to June 2022, for the unscheduled fault outages was 29.75 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 159.92 interruptions per customer. And the total SAIFI of the scheduled and unscheduled was 189.67 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for the unscheduled fault outages was 55.62 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 338.50 interruptions per customer and the result of total SAIFI for both the scheduled and unscheduled was 394.11 interruptions per customer.

CAIDI:

The CAIDI of S&D division Satkhira from January 2022 to June 2022, for the unscheduled fault outages was 8.14 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 14.38 minutes per interruption. And the total CAIDI of the scheduled and unscheduled was 13.41 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for the unscheduled fault outages was 7.28 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 22.84 minutes per interruption and the result of total CAIDI for both the scheduled and unscheduled was 20.65 minutes per interruption.

The SAIDI, SAIFI & CAIDI of S&D Division Satkhira are provided in **Tables 82-83.**

TABLE-82: MONTHLY SAIDI, SAIFI, CAIDI UNDER WZPDCL: S&D DIVISION SATKHIRA FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	Jan_22	33	0	158	191	209	0	2376	2585	46747	46747	1506380	228792	15502561	1204346	17008941	1433138	32.22	331.63	363.85	4.89	25.76	30.66	6.58	12.87	11.87
2	Feb_22	24	0	147	171	227	0	2454	2681	47006	47006	1455105	159864	16254719	982902	17709824	1142766	30.96	345.80	376.76	3.40	20.91	24.31	9.10	16.54	15.50
3	Mar_22	27	0	143	170	223	0	2196	2419	47222	47222	1495351	182809	14749033	971069	16244384	1153878	31.67	312.33	344.00	3.87	20.56	24.44	8.18	15.19	14.08
4	Apr_22	43	43	188	274	299	1138	1893	3330	47554	47554	2021639	282204	21258728	1599931	23280367	1882135	42.51	447.04	489.56	5.93	33.64	39.58	7.16	13.29	12.37
5	May_22	27	0	213	240	332	0	2878	3210	49788	49788	2400461	193718	20638909	1521375	23039370	1715093	48.21	414.54	462.75	3.89	30.56	34.45	12.39	13.57	13.43
6	Jun_22	53	8	188	249	389	81	3037	3507	50012	50012	2753685	382160	22144504	1405382	24898189	1787542	55.06	442.78	497.84	7.64	28.10	35.74	7.21	15.76	13.93
Total	JAN 22-JUN 22	207	51	1037	1295	1679	1219	14834	17732	48055	288329	11632621	1429547	110548454	7685005	122181075	9114552	242.07	2300.46	2542.53	29.75	159.92	189.67	8.14	14.38	13.41

TABLE-83: MONTHLY SAIDI, SAIFI, CAIDI UNDER WZPDCL: S&D DIVISION SATKHIRA FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JUL-22	40	204	131	375	360	8444	2120	10924	50315	50315	2549303	278367	78403029	2552703	80952332	2831070	50.67	1558.24	1608.91	5.53	50.73	56.27	9.16	30.71	28.59
2	AUG-22	35	205	213	453	340	9762	2878	12980	50522	50522	2370729	248371	93133247	3037953	95503976	3286324	46.92	1843.42	1890.34	4.92	60.13	65.05	9.55	30.66	29.06
3	SEP-22	47	99	131	277	363	4471	2576	7410	50772	50772	2618423	356497	51731721	1788949	54350144	2145446	51.57	1018.90	1070.47	7.02	35.23	42.26	7.34	28.92	25.33
4	OCT-22	48	25	165	238	409	805	1961	3175	50998	50998	2930204	353720	19744087	1506645	22674291	1860365	57.46	387.15	444.61	6.94	29.54	36.48	8.28	13.10	12.19
5	NOV-22	36	0	204	240	254	0	2120	2374	51219	51219	1908870	271758	15785274	1482037	17694144	1753795	37.27	308.19	345.46	5.31	28.94	34.24	7.02	10.65	10.09
6	DEC-22	28	0	132	160	236	0	2876	3112	51458	51458	1751808	215097	18233655	1063977	19985463	1279074	34.04	354.34	388.38	4.18	20.68	24.86	8.14	17.14	15.62
7	JAN-23	33	57	167	257	188	2648	1722	4558	51898	51898	1418690	252146	33088093	1679793	34506783	1931939	27.34	637.56	664.90	4.86	32.37	37.23	5.63	19.70	17.86
8	FEB-23	33	23	133	189	211	1037	2096	3344	52131	52131	1539715	253194	24090861	1151937	25630576	1405131	29.54	462.12	491.66	4.86	22.10	26.95	6.08	20.91	18.24
9	MAR-23	24	2	149	175	192	108	2109	2409	52416	52416	1370729	186356	16733390	1120033	18104119	1306389	26.15	319.24	345.39	3.56	21.37	24.92	7.36	14.94	13.86
10	APR_23	61	90	178	329	323	4177	2080	6580	52587	52587	2376568	444915	46715494	2025427	49092062	2470342	45.19	888.35	933.54	8.46	38.52	46.98	5.34	23.06	19.87
TOTAL	JULY22 -APR23	385	705	1603	2693	2876	31452	22538	56866	51432	514316	20835039	2860421	397658851	17409454	418493890	20269875	405.10	7731.80	8136.90	55.62	338.50	394.11	7.28	22.84	20.65

5.2.3.5.3 SUMMARY OF WZPDCL - KHULNA AND SHATKHIRA ARE GIVEN BELOW BASED ON THE TABLE-80 TO 83

The Power Cell established SAIDI and SAIFI targets for WZPDCL as key performance indicators (KPIs). For the financial year 2021-2022, the targets were set at 800 minutes per customer for SAIDI and 80 interruptions per customer for SAIFI. Upon analysing the data from the selected two S&D divisions, it was determined that the average SAIFI was 138.22 interruptions per customer and the average SAIDI was 1818.07 minutes per customer during a 6-month period from January 22 to July 22.

The targets for SAIDI and SAIFI during the financial year 2022-2023 were established as 1440 minutes per customer and 95 interruptions per customer, respectively, as key performance indicators (KPIs). After analysing the data from Khulna S&D Division-3 and Satkhira S&D Division, it was found that the average SAIDI was 5232.76 minutes per customer and the average SAIFI was 276.05 interruptions per customer over a 10-month period (July 22 to April 23).

Furthermore, the average SAIDI and SAIFI attributed to fault outages were determined to 433.12 minutes per customer and 48.30 interruptions per customer, respectively, due to generation and transmission limitations, the NLDC (National Load Dispatch Centre) imposed forced load shedding, particularly from July 2023 to November 2023.As a result, the SAIDI and SAIFI values increased. The SAIDI due to forced load shedding was 4799.64 minutes, while the SAIFI was 227.76 interruptions per customer.

Furthermore, SAIDI, SAIFI, and CAIDI values were separately calculated for unscheduled events such as fault outages and scheduled events including load shedding and scheduled maintenance. The data from July 2022 to November 2022 indicates an increase in SAIDI and SAIFI during scheduled outages, which can be attributed to generation and transmission limitations. This resulted in higher values for SAIDI and SAIFI during that period. A summary of the average SAIDI, SAIFI, and CAIDI for Khulna S&D Division-3 and Satkhira S&D Division under WZPDCL is presented in **Table-84 and 85** for the financial years 2021-2022 and 2022-2023.

TABLE-84: SUMMARY FOR THE MONTH OF JANUARY 2022 - JUNE 2022 (FY 2021-2022)
WZPDCL: AVERAGE SAIDI SAIFI AND CAIDI OF S&D DIVISION KHULNA-3 AND SATKHIRA

Name of the Division	Name of the year	Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
				Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
KHULNA	YEAR: JAN - JUN 2022	42456	254735	12441657	1112627	29932194	2283013	42373851	3395640.00	293.05	705.02	998.07	26.21	53.77	79.98	11.18	13.11	12.48
SATKHIRA	YEAR: JAN22-JUN22	48055	288329	11632621	1429547	110548454	7685005	122181075	9114552	242.07	2300.46	2542.53	29.75	159.92	189.67	8.14	14.38	13.41
TOTAL	YEAR: JAN22-JUN22	90511	543064	24074278	2542174	140480648	9968018	164554926	12510192	265.98	1552.09	1818.07	28.09	110.13	138.22	9.47	14.09	13.15

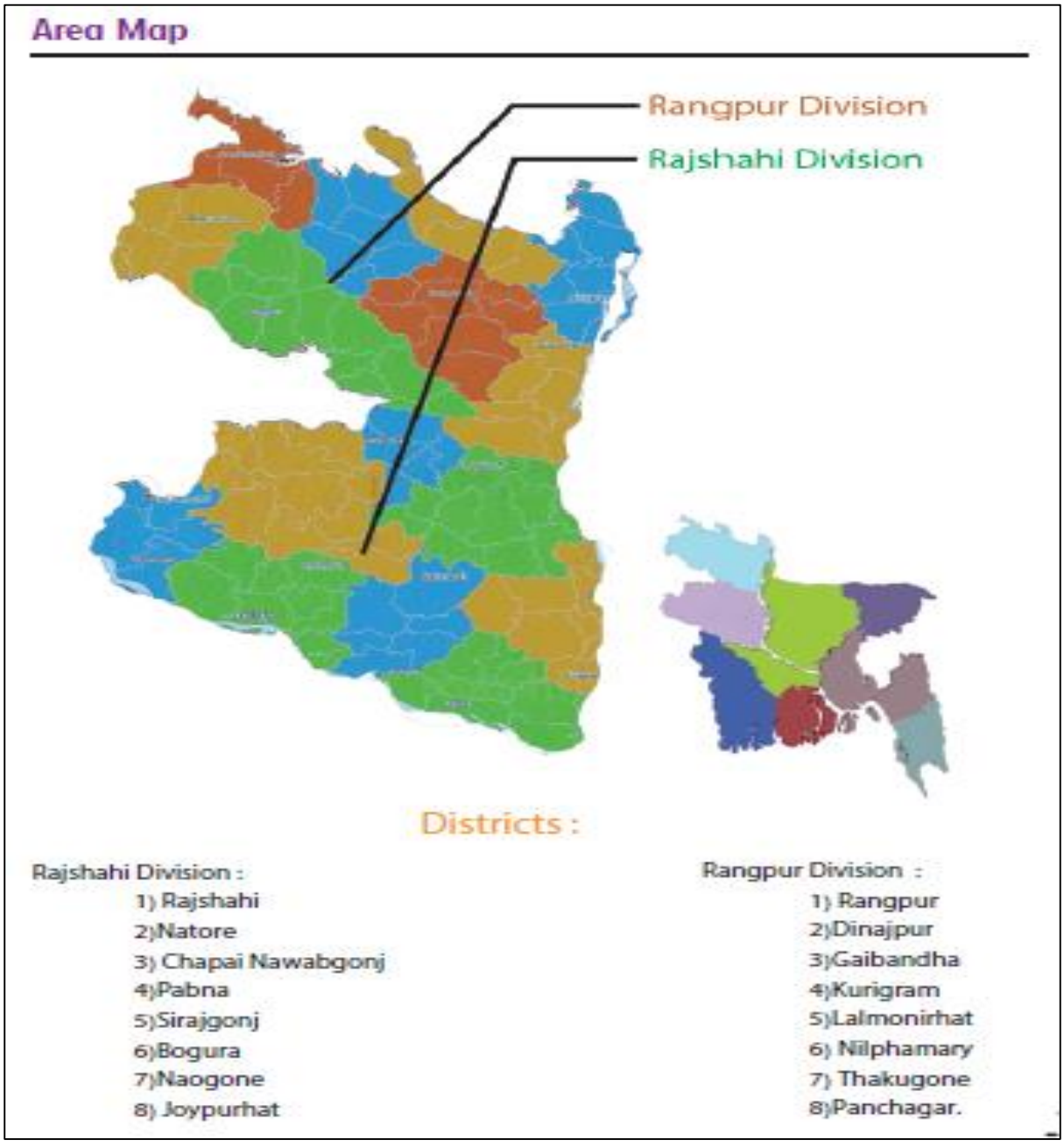
TABLE-85: SUMMARY FOR THE MONTH OF JULY 2022- APRIL 2023 (FY 2022-2023)
WZPDCL: AVERAGE SAIDI SAIFI AND CAIDI OF S&D DIVISION KHULNA-3 AND SATKHIRA

Name of the Division	Name of the year	Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
				Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
KHULNA	YEAR: JUL22-APR23	43501	435008	20282206	1724466	57982592	4212159	78264798	5936625	466.25	1332.91	1799.16	39.64	96.83	136.47	11.76	13.77	13.18
SATKHIRA	YEAR: JUL22-APR23	51432	514316	20835039	2860421	397658851	17409454	418493890	20269875	405.10	7731.80	8136.90	55.62	338.50	394.11	7.28	22.84	20.65
TOTAL	YEAR: JUL22-APR23	94932	949324	41117245	4584887	455641443	21621613	496758688	26206500	433.12	4799.64	5232.76	48.30	227.76	276.05	8.97	21.07	18.96

5.2.3.6 Northern Electric Supply Company Ltd. (NESCO)

Interruption data for Rangpur S&D 2 and Rangpur S&D 3 has been provided in the prescribed form for the periods of January to June 2022 and July to April 2023.The interruption data has been analysed, and the computation of interruption data has been done on a monthly feeder-wise basis. Feeder-wise SAIDI, SAIFI, and CAIDI have been calculated for each month. The monthly SAIDI, SAIFI, and CAIDI reports for FY 2021-2022 and FY 2022-2023 have been summarized. The month-wise SAIDI, SAIFI, and CAIDI values for Rangpur S&D 2 and Rangpur S&D 3 are illustrated below, as provided in **Table no 86 to 89 and figure-57.**

FIGURE-57: NESCO GEOGRAPHICAL AREA MAP



5.2.3.6.1 STATUS OF SAIDI, SAIFI AND CAIDI FOR S&D-2 DIVISION RANGPUR OF NESCO

SAIDI:

The analysis of the collected data unveiled that the total duration of **SAIDI** for the period of January 2022 to June 2022 of S&D Division Rangpur-2 was 20.49 minutes per customer, while the scheduled Load Shedding and maintenance accounted for 10.79 minutes per customer, and the unscheduled fault outages were 9.70 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 2128.94 minutes per customer, where scheduled Load Shedding and maintenance counted for 1326.90 minutes per customer and the unscheduled fault outages were 802.04 minutes per customer.

SAIFI:

The SAIFI of S&D Division Rangpur-2 from January 2022 to June 2022, for the unscheduled fault outages was 1.22 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 1.47 interruptions per customer. And the total SAIFI of scheduled and unscheduled was 2.69 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for unscheduled fault outages was 85.43 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 143.95 interruptions per customer and the result of total SAIFI for both scheduled and unscheduled was 229.38 interruptions per customer.

CAIDI:

The CAIDI of S&D Division Rangpur-2 from January 2022 to June 2022, for the unscheduled fault outages was 7.95 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 7.36 minutes per interruption. And the total CAIDI of scheduled and unscheduled was 7.62 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for unscheduled fault outages was 9.39 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 9.22 minutes per interruption and the result of total CAIDI for both scheduled and unscheduled was 9.28 minutes per interruption.

The SAIDI, SAIFI & CAIDI of S&D Division Rangpur-2 are provided in **Tables 86-87.**

TABLE-86: MONTHLY SAIDI, SAIFI, CAIDI UNDER NESCO: S&D DIVISION RANGPUR-2 FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JAN_22	45	0	61	106	276	0	304	580	47533	2272	41066	9022	42046	12298	83112	21320	0.86	0.88	1.75	0.19	0.26	0.45	4.55	3.42	3.90
2	FEB_22	150	0	204	354	874	0	1360	2234	47730	778	106356	18222	163485	24926	269841	43148	2.23	3.43	5.65	0.38	0.52	0.90	5.84	6.56	6.25
3	MAR_22	139	0	167	306	897	0	998	1895	48041	517	60569	8607	61745	10200	122314	18807	1.26	1.29	2.55	0.18	0.21	0.39	7.04	6.05	6.50
4	APR_22	65	0	31	96	912	0	338	1250	47474	407	50646	3956	23284	2216	73930	6172	1.07	0.49	1.56	0.08	0.05	0.13	12.80	10.51	11.98
5	MAY_22	164	0	178	342	1808	0	1794	3602	47723	453	133366	12099	131322	13126	264688	25225	2.79	2.75	5.55	0.25	0.28	0.53	11.02	10.00	10.49
6	JUN_22	89	0	104	193	1011	0	1354	2365	48041	388	71218	6374	93364	7279	164582	13653	1.48	1.94	3.43	0.13	0.15	0.28	11.17	12.83	12.05
Total	YEAR: JAN 22-JUN 22	652	0	745	1397	5778	0	6148	11926	47757	4815	463221	58280	515246	70045	978467	128325	9.70	10.79	20.49	1.22	1.47	2.69	7.95	7.36	7.62

TABLE-87: MONTHLY SAIDI, SAIFI, CAIDI UNDER NESCO: S&D DIVISION RANGPUR-2FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JUL-22	190	0	307	497	1611	0	2454	4065	48473	48473	13029430	1586940	20486590	2633331	33516020	4220271	268.80	422.64	691.44	32.74	54.33	87.06	8.21	7.78	7.94
2	AUG-22	92	0	120	212	979	0	1389	2368	48900	435	73482	6887	101666	9007	175148	15894	1.50	2.08	3.58	0.14	0.18	0.33	10.67	11.29	11.02
3	SEP-22	113	0	202	315	1273	0	2345	3618	48897	416	92111	8238	168662	14704	260773	22942	1.88	3.45	5.33	0.17	0.30	0.47	11.18	11.47	11.37
4	OCT-22	188	0	310	498	1947	0	3388	5335	49186	49186	15733078	1506361	27869491	2541460	43602569	4047821	319.87	566.61	886.48	30.63	51.67	82.30	10.44	10.97	10.77
5	NOV-22	156	0	484	640	1605	0	4200	5805	49381	557	138318	13765	383737	47026	522055	60791	2.80	7.77	10.57	0.28	0.95	1.23	10.05	8.16	8.59
6	DEC-22	224	0	524	748	1932	0	4945	6877	49744	530	161272	18704	446373	48414	607645	67118	3.24	8.97	12.22	0.38	0.97	1.35	8.62	9.22	9.05
7	JAN-23	57	0	101	158	609	0	1137	1746	50061	439	47649	4353	88859	7957	136508	12310	0.95	1.78	2.73	0.09	0.16	0.25	10.95	11.17	11.09
8	FEB-23	41	0	64	105	414	0	650	1064	50218	471	33039	3315	50867	4998	83906	8313	0.66	1.01	1.67	0.07	0.10	0.17	9.97	10.18	10.09
9	MAR-23	63	0	79	142	608	0	787	1395	50401	50401	5186866	542702	6604157	672618	11791023	1215320	102.91	131.03	233.94	10.77	13.35	24.11	9.56	9.82	9.70
10	APR_23	66	0	148	214	640	0	1243	1883	51243	51243	5326149	550438	9680814	1167543	15006963	1717981	103.94	188.92	292.86	10.74	22.78	33.53	9.68	8.29	8.74
Total	JULY 22-APR 23	1190	0	2339	3529	11618	0	22538	34156	49650	202151	39821394	4241703	65881216	7147058	105702610	11388761	802.04	1326.90	2128.94	85.43	143.95	229.38	9.39	9.22	9.28

5.2.3.6.2 STATUS OF SAIDI, SAIFI AND CAIDI FOR S&D-3 DIVISION, RANGPUR OF NESCO

SAIDI:

The analysis of the collected data unveiled that the total duration of **SAIDI** for the period of January 2022 to June 2022 of S&D Division Rangpur-3 was 34.43 minutes per customer, while the scheduled Load Shedding and maintenance accounted for 14.85 minutes per customer, and the unscheduled fault outages were 19.58 minutes per customer. In the next FY, from July 2022 to April 2023, the total SAIDI of this period was 160.02 minutes per customer, where the scheduled Load Shedding and maintenance counted for 108.22 minutes per customer and the unscheduled fault outages were 51.80 minutes per customer.

SAIFI:

The SAIFI of S&D Division Rangpur-3, from January 2022 to June 2022, for the unscheduled fault outages was 0.69 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 0.82 interruptions per customer. And the total SAIFI of scheduled and unscheduled was 1.33 interruptions per customer. Subsequently, in the next FY July 2022 to April 2023, the SAIFI for unscheduled fault outages was 1.35 interruptions per customer, while the scheduled Load Shedding and maintenance accounted was 3.05 interruptions per customer and the result of total SAIFI for both scheduled and unscheduled was 4.40 interruptions per customer.

CAIDI:

The CAIDI of S&D Division Rangpur-3 from January 2022 to June 2022, for the unscheduled fault outages was 28.36 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 18.03 minutes per interruption. And the total CAIDI of scheduled and unscheduled was 25.81 minutes per interruption. Subsequently, in the next FY July 2022 to April 2023, the CAIDI for unscheduled fault outages was 38.31 minutes per interruption, while the scheduled Load Shedding and maintenance accounted was 35.46 minutes per interruption and the result of total CAIDI for both the scheduled and unscheduled was 36.33 minutes per interruption.

The SAIDI, SAIFI & CAIDI of S&D Division Rangpur-2 are provided in **Tables-88 to 89.**

TABLE-88: MONTHLY SAIDI, SAIFI, CAIDI UNDER NESCO: S&D DIVISION RANGPUR-3 FOR THE PERIOD OF FY 2021-2022

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JAN_22	92	0	64	156	4346	0	2247	6593	26812	99	64462	1463	35942	6336	100404	2536	2.40	1.34	3.74	0.05	0.24	0.09	44.06	5.67	39.59
2	FEB_22	67	0	63	130	2315	0	1352	3667	29646	182	54045	1896	28969	1732	83014	3628	1.82	0.98	2.80	0.06	0.06	0.12	28.50	16.73	22.88
3	MAR_22	202	0	101	303	7138	0	3566	10703	29646	131	130279	3984	72357	2038	202636	6022	4.39	2.44	6.84	0.13	0.07	0.20	32.70	35.50	33.65
4	APR_22	73	0	37	110	1363	0	812	2175	29646	185	36399	1943	21467	962	57866	2905	1.23	0.72	1.95	0.07	0.03	0.10	18.73	22.32	19.92
5	MAY_22	248	0	146	394	8138	0	2769	10907	29646	183	160961	6090	55754	3591	216715	9681	5.43	1.88	7.31	0.21	0.12	0.33	26.43	15.52	22.39
6	JUN_22	209	269	143	621	5892	6999	3280	16171	29646	160	125081	4766	218832	9377	343913	14143	4.22	7.38	11.60	0.16	0.32	0.48	26.24	23.34	24.32
Total	YEAR: JAN 22-JUN 22	891	269	554	1714	29191	6999	14026	50216	29174	940	571227	20142.12	433320.72	24035.72	1004548	38914.84	19.58	14.85	34.43	0.69	0.82	1.33	28.36	18.03	25.81

TABLE-89: MONTHLY SAIDI, SAIFI, CAIDI UNDER NESCO: S&D DIVISION RANGPUR-3 FOR THE PERIOD OF FY 2022-2023

Sl. No.	Name of The Month	Interruption Due to System fault, Load Shedding & Maintenance								Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
		Interruption in Nos.				Interruption in min.																				
		Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total	Unscheduled Fault/ Outage	Schedule Load Shedding and Maintenance		Total			Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	JUL-22	241	520	169	930	8080	15065	5589	28734	29646	122	142700	4285	370027	12310	512727	16595	4.81	12.48	17.29	0.14	0.42	0.56	33.30	30.06	30.90
2	AUG-22	206	308	164	678	10276	17199	5542	33017	29646	77	115000	2403	264593	5465	379593	7868	3.88	8.93	12.80	0.08	0.18	0.27	47.86	48.42	48.25
3	SEP-22	356	621	238	1215	14878	20753	8411	44042	29646	93	204262	5002	397940	11865	602202	16867	6.89	13.42	20.31	0.17	0.40	0.57	40.84	33.54	35.70
4	OCT-22	381	703	278	1362	16692	23715	9043	49450	29646	103	254999	5804	499616	14729	754615	20533	8.60	16.85	25.45	0.20	0.50	0.69	43.94	33.92	36.75
5	NOV-22	416	889	280	1585	17434	33043	11235	61712	29646	95	249072	5882	627087	16403	876159	22285	8.40	21.15	29.55	0.20	0.55	0.75	42.34	38.23	39.32
6	DEC-22	424	969	298	1691	17582	35320	11324	64226	29646	96	255808	6100	671194	18143	927002	24243	8.63	22.64	31.27	0.21	0.61	0.82	41.94	36.99	38.24
7	JAN-23	166	0	113	279	5030	0	3515	8545	29646	153	114570	3878	82105	2674	196675	6552	3.86	2.77	6.63	0.13	0.09	0.22	29.54	30.70	30.02
8	FEB-23	98	0	58	156	4330	0	2089	6419	29646	116	78280	1804	37890	1152	116170	2956	2.64	1.28	3.92	0.06	0.04	0.10	43.39	32.89	39.30
9	MAR-23	80	0	50	130	2073	0	1594	3667	26958	171	39849	2072	37703	1336	77552	3408	1.48	1.40	2.88	0.08	0.05	0.13	19.23	28.22	22.76
10	APR_23	104	176	62	342	2619	5886	2004	10509	26958	134	53286	2131	162061	4764	215347	6895	1.98	6.01	7.99	0.08	0.18	0.26	25.01	34.02	31.23
TOTAL	JULY 22 - APR 23	2472	4186	1710	8368	98994.1	150979.8	60346.16	310320.1	29108	1160	1507825.9	39361	3150215.6	88841	4658041.497	128202	51.80	108.22	160.02	1.35	3.05	4.40	38.31	35.46	36.33

5.2.3.6.3 SUMMARY OF NESCO–S&D 2 AND 3, RANGPUR ARE GIVEN BELOW BASED ON THE TABLE-86 TO 89

The Power Cell set SAIDI and SAIFI targets for NESCO as key performance indicators (KPIs) for the financial year 2021-2022. The targets were 600 minutes per customer for SAIDI and 60 interruptions per customer for SAIFI. Upon analysing the data from the selected two S&D divisions, it was determined that the average SAIFI was 2.17 interruptions per customer and the average SAIDI was 25.78 minutes per customer over a 6-month period (January 22 to July 22).

The target for SAIDI and SAIFI during the financial year 2022-2023 was set at 1370 minutes per customer and 60 interruptions per customer as key performance indicators (KPIs) by the Power Cell. Upon analysing the data from the selected division, it was found that the average SAIDI and SAIFI were 1401.25 minutes per customer and 146.23 interruptions per customer over a period of 10 months (July 22 to April 23).

The average SAIDI and SAIFI due to fault outage were calculated to be 525.76 minutes per customer and 54.36 interruptions per customer, respectively, which are within the target set up by the Power Cell. During the period of July 23 to November 2023, NLDC imposed forced load shedding due to generation and transmission limitations. As a result, the SAIDI and SAIFI due to forced load shedding were 876.49 minutes per customer and 91.87 interruptions per customer.

The SAIDI, SAIFI, and CAIDI of the two divisions under NESCO for the periods of January 22 to June 22 and July 22 to April 23 are provided in the table and graph below. SAIDI, SAIFI, and CAIDI values due to unscheduled (fault outage) and scheduled (load shedding and schedule maintenance) events are separately calculated. After July 2022, it can be observed that the SAIDI and SAIFI values increased during scheduled outages due to generation and transmission limitations. A summary of the average SAIDI, SAIFI, and CAIDI for the two divisional offices under NESCO is presented in **Table-90 and Table-91** for the FY 2021-2022 and 2022-2023.

TABLE-90: SUMMARY FOR THE MONTH OF JANUARY 2022 - JUNE 2022 (FY 2021-2022)
NESCO: AVERAGE SAIDI SAIFI AND CAIDI OF S&D DIVISION RANGPUR-2 AND RANGPUR-3

Name of the Division	Name of the year	Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
				Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
RANGPUR-2	YEAR: JAN - JUN 2022	47757	4815	463220.5	58280	515246	70045	978466.5	128325.00	9.70	10.79	20.49	1.22	1.47	2.69	7.95	7.36	7.62
RANGPUR-3	YEAR: JAN22-JUN22	29174	939.66	571227.233	20142.12	433320.7173	24035.72	1004548	38914.84	19.58	14.85	34.43	0.69	0.82	1.33	28.36	18.03	25.81
TOTAL	YEAR: JAN22-JUN22	76931	5754.66	1034447.73	78422.12	948566.7173	94080.72	1983014.5	167239.84	13.45	12.33	25.78	1.02	1.22	2.17	13.19	10.08	11.86

TABLE-91: SUMMARY FOR THE MONTH OF JULY2022- APRIL2023 (FY 2022-2023)
NESCO: AVERAGE SAIDI SAIFI AND CAIDI OF S&D DIVISION RANGPUR-2 AND RANGPUR-3

Name of the Division	Name of the year	Total Number of Customer of the Div.	Number Customer Interrupted	Unscheduled Fault/Outage		Schedule Load Shedding & Maintenance		Total Schedule and Unscheduled		SAIDI			SAIFI			CAIDI		
				Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Customer-Outage (Min.)	Customer-Interruption (Nos.)	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
RANGPUR-2	YEAR: JUL22-APR23	49650	202151	39821394	4241703	65881216	7147058	105702610	11388761.00	802.04	1326.90	2128.94	85.43	143.95	229.38	9.39	9.22	9.28
RANGPUR-3	YEAR: JUL22-APR23	29108	1160	1507825.88	39361	3150215.622	88841	4658041.497	128202	51.80	108.22	160.02	1.35	3.05	4.40	38.31	35.46	36.33
TOTAL	YEAR: JUL22-APR23	78759	203311	41329219.9	4281064	69031431.62	7235899	110360651.5	11516963	524.76	876.49	1401.25	54.36	91.87	146.23	9.65	9.54	9.58

5.2.3.7 SUMMARY OF SAIDI & SAIFI

The interruptions were collected and recorded from 14 divisional offices under BPBD, BREB, DPDC, DESCO, WZPDCL, and NESCO. It was assumed that the average SAIDI and SAIFI values obtained from the surveyed divisions reflect the approximate SAIDI and SAIFI values of the respective utilities/companies. A summary of the SAIDI and SAIFI achievements is provided in the **table-92**. It is important to note that during the FY 2022-2023, there was forced load shedding imposed by NLDC due to limitations in generation and transmission, particularly from July 22 to November 22. During this period, the SAIDI and SAIFI values in terms of minutes and interruptions increased. The utility-wise summary is presented in **Table-92 to 93** and **figure-58 to 63** for the FY 2021-2022 and FY 2022-2023.

The **Table-92** shows the average values of SAIDI, SAIFI, and CAIDI of 14 divisions under 6 utilities from January 2022 and June 2022, in 6-months. The calculated overall average SAIDI was 2037.10 Minutes per customer, where the unscheduled fault outages were 479.25 Minutes per customer and scheduled Load Shedding and maintenance were 1557.86 Minutes per customer. It is mentioned that in FY 2021-2022, the annual average target of SAIDI was set at 1050 Minutes per customer. The calculated overall average SAIFI was 95.55 interruptions per customer, Which Includes Unscheduled Fault Outages were 24.49 interruptions per customer and the Scheduled Load Shedding and Maintenance were 71.23 interruptions per customer. The overall average CAIDI was 21.32 minutes per interruption. This includes 19.57 minutes per interruption for unscheduled fault outages and 21.87 minutes per interruption for the scheduled Load Shedding and maintenance. However, due to fault outages, SAIDI, SAIFI, and CAIDI were within the target limit. It is observed that the average targeted limit was crossed due to the force load shedding imposed from NLDC.

Apparently, the data in **table-93** represents the average values of SAIDI, SAIFI, and CAIDI for 14 divisions under 6 utilities during the period from July 2022 to April 2023. It is also observed that the data was collected at 10-months intervals. The Calculated Overall Average SAIDI of Selected 14 Divisions under 6 Utilities were 4112.95 minutes per customer, which Includes Unscheduled Fault Outages Are 783.72 minutes per customer and the Scheduled Load Shedding and Maintenance at 3329.23 minutes per customer. It is mentioned that in FY 2022-2023, the annual average target of SAIDI was 1850 minutes per customer.

The Calculated Overall Average SAIFI was 171.16 Interruptions where 'Unscheduled Fault Outages' were 43.73 and 'Scheduled Load Shedding and Maintenance' was 127.40 interruptions. The overall average CAIDI was 24.03 minutes per interruption. This includes 17.92 Minutes for unscheduled fault outages and 26.13 minutes for the scheduled Load Shedding and maintenance. It is also observed that, the SAIDI, SAIFI, and CAIDI data therefore from fault outages remained within the target limit. Although, the target limit was gone beyond due to the imposition of forced load shedding by NLDC.

TABLE-92: SUMMARY OF UTILITY-WISE SAIDI, SAIFI & CAIDI
(YEAR: JANUARY 2022- JUNE 2022)

Division	SAIDI			SAIFI			CAIDI		
	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
BPDB	63.71	33.99	97.70	4.30	2.45	6.85	14.81	13.87	14.26
BREB	791.03	2567.81	3358.84	38.67	109.44	148.11	20.46	23.46	22.68
DPDC	140.30	196.90	337.20	9.90	20.58	26.08	14.18	9.57	12.93
DESCO	138.38	387.63	526.01	4.65	22.35	27.28	29.77	17.35	19.28
WZPDCL	265.98	1552.09	1818.07	28.09	110.13	138.22	9.47	14.09	13.15
NESCO	13.45	12.33	25.78	1.02	1.22	2.17	13.19	10.08	11.86
Total	479.25	1557.86	2037.10	24.49	71.23	95.55	19.57	21.87	21.32

FIGURE-58: SUMMARY OF UTILITY-WISE SAIDI
(YEAR: JANUARY 2022- JUNE 2022)

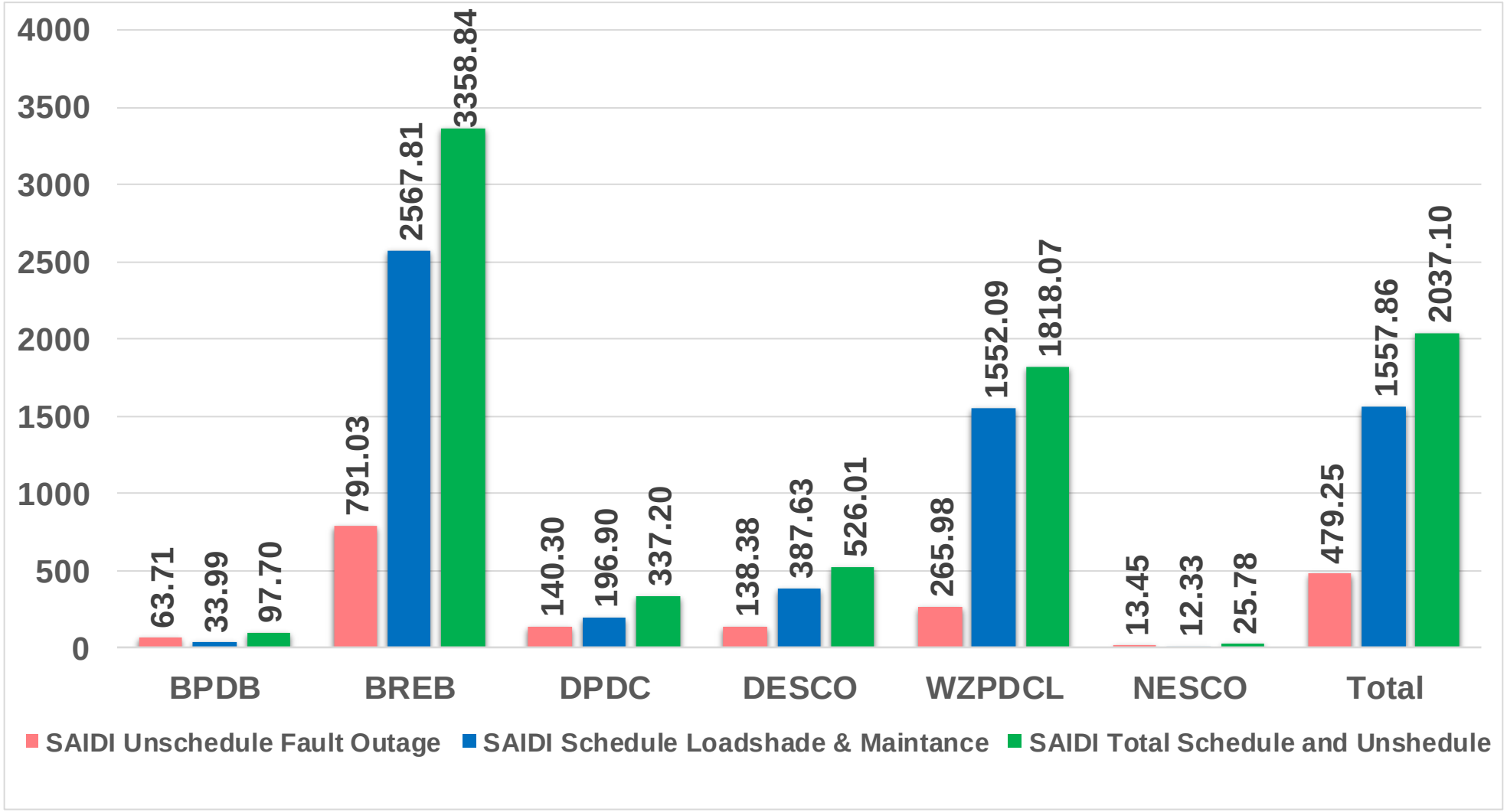


FIGURE-59: SUMMARY OF UTILITY-WISE SAIFI
(YEAR: JANUARY 2022- JUNE 2022)

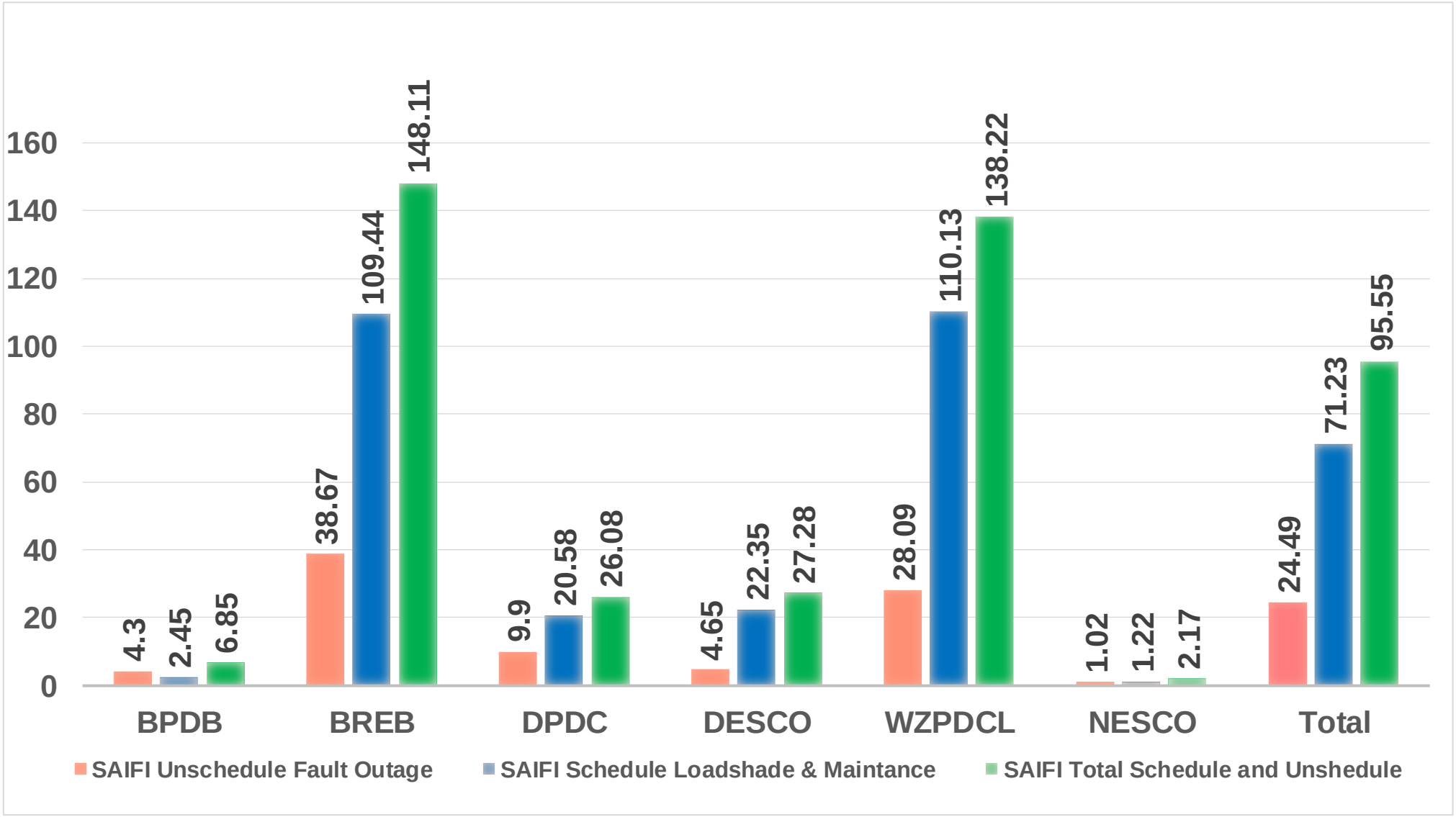


FIGURE-60: SUMMARY OF UTILITY-WISE CAIDI
(YEAR: JANUARY 2022- JUNE 2022)

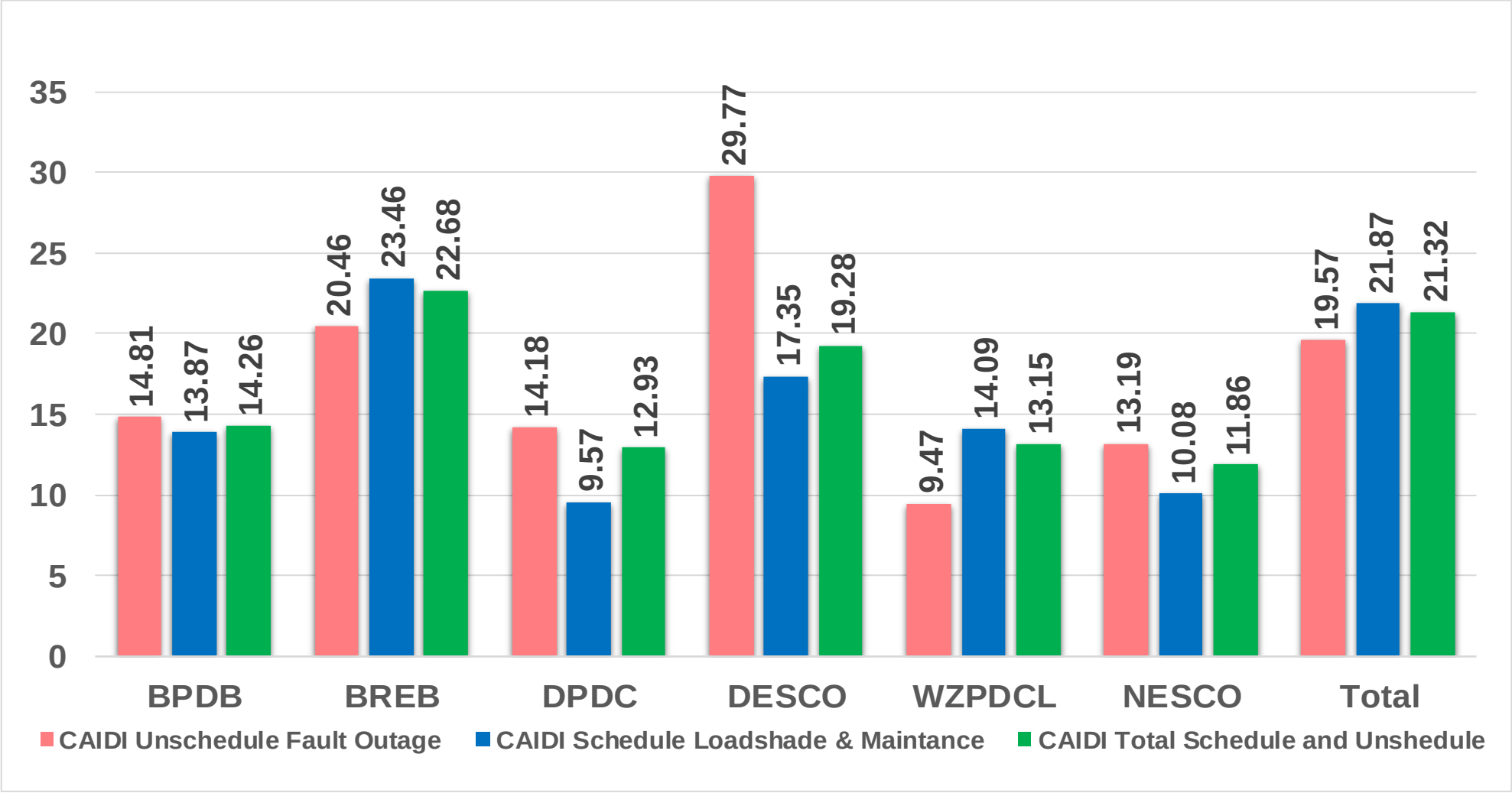


TABLE-93: SUMMARY OF UTILITY-WISE SAIDI, SAIFI & CAIDI
(YEAR: JULY 2022- APRIL 2023)

Division	SAIDI			SAIFI			CAIDI		
	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled	Unscheduled Fault Outage	Schedule Load Shedding & Maintenance	Total Schedule and Unscheduled
0	1	2	3	4	5	6	7	8	9
BPDB	100.85	1977.53	2078.38	7.34	48.79	56.13	13.74	40.53	37.03
BREB	1250.86	3968.00	5218.86	61.63	157.69	219.31	20.30	25.16	23.80
DPDC	271.54	6666.36	6937.90	22.82	148.54	171.35	11.90	44.88	40.49
DESCO	132.64	1101.73	1234.36	10.54	38.22	48.76	12.58	28.82	25.31
WZPDCL	433.12	4799.64	5232.76	48.30	227.76	276.05	8.97	21.07	18.96
NESCO	524.76	876.49	1401.25	54.36	91.87	146.23	9.65	9.54	9.58
Total	783.72	3329.23	4112.95	43.76	127.40	171.16	17.91	26.13	24.03

FIGURE-61: SUMMARY OF UTILITY-WISE SAIDI
(YEAR: JULY2022- APRIL 2023)

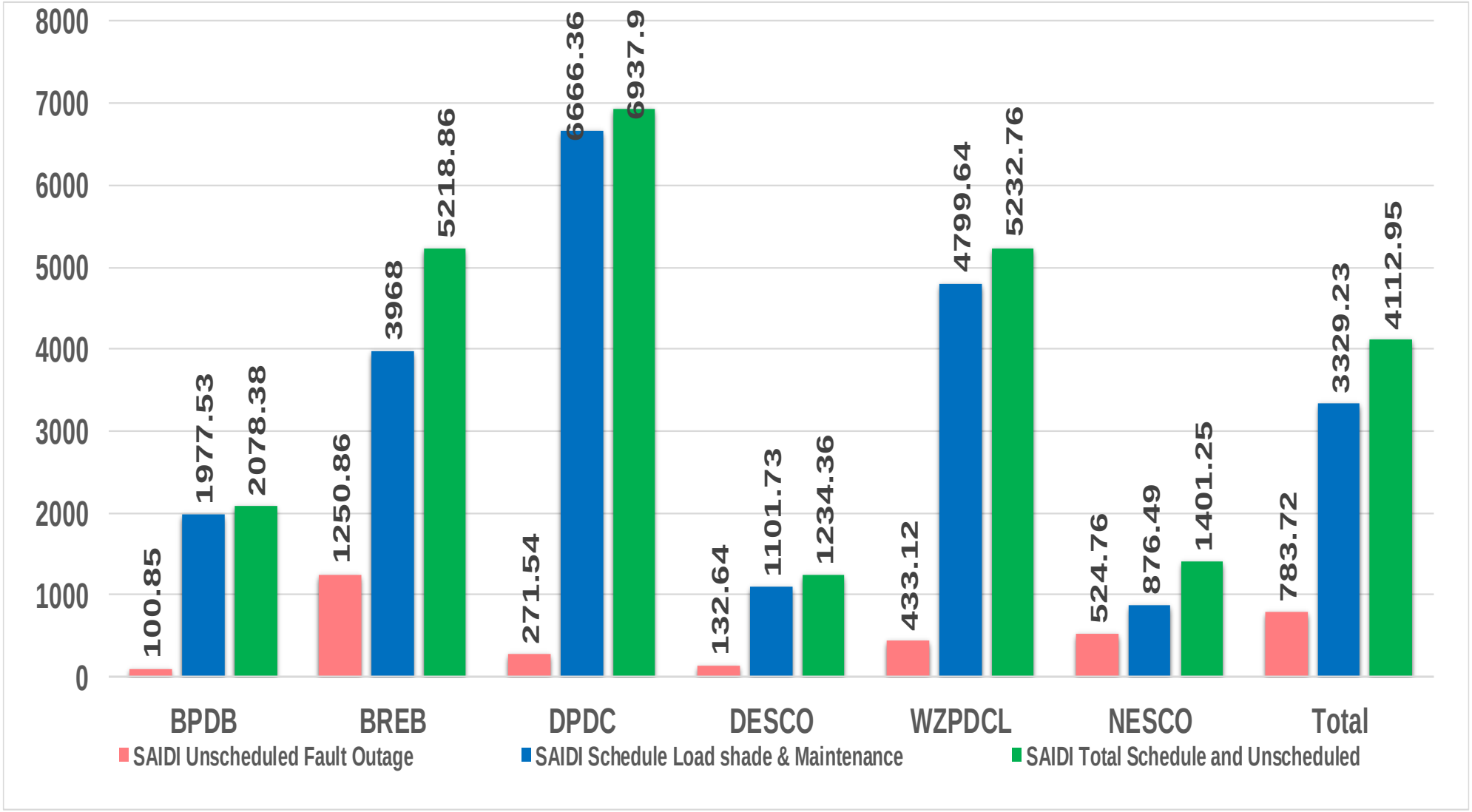


FIGURE-62: SUMMARY OF UTILITY-WISE SAIFI
(YEAR: JULY 2022- APRIL 2023)

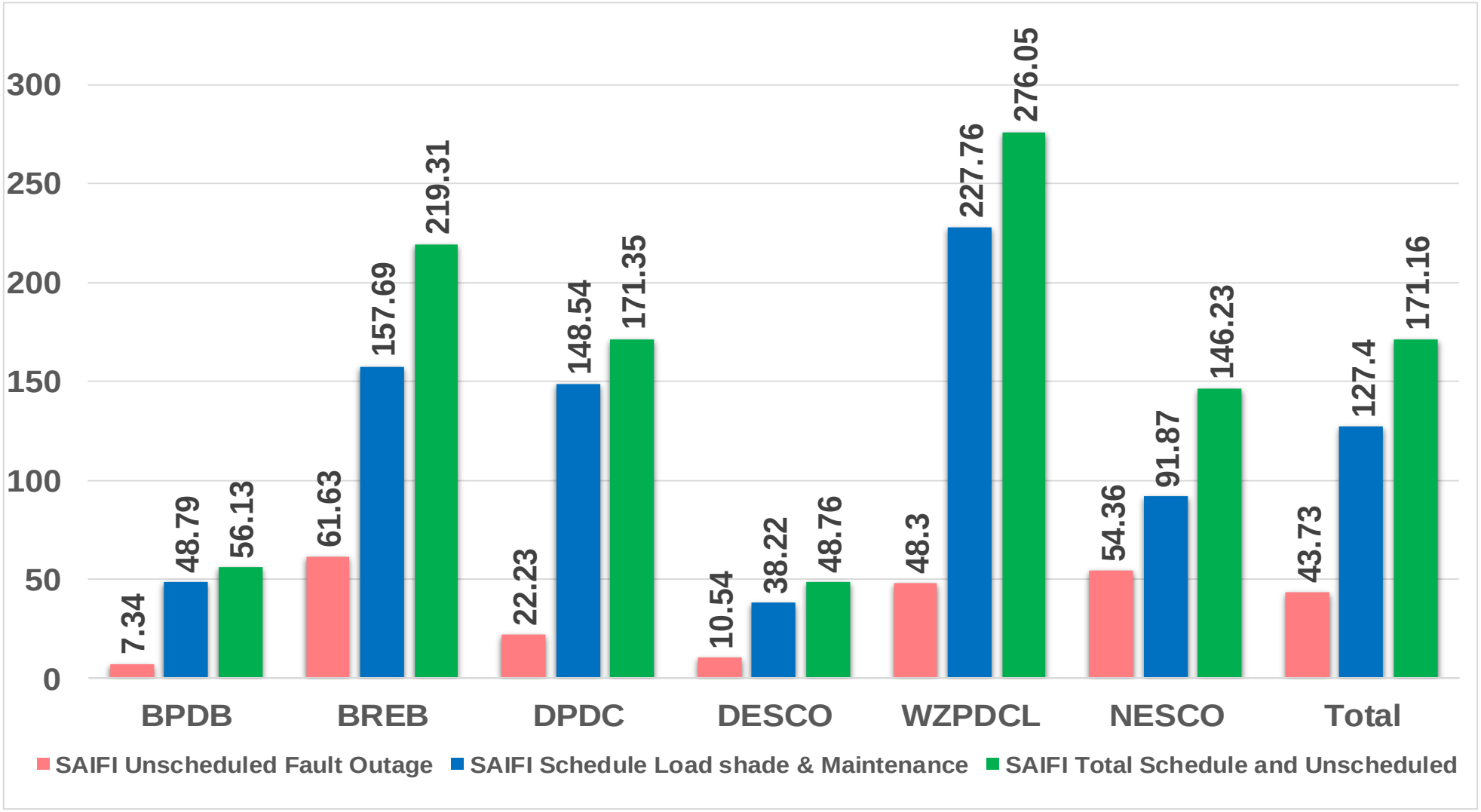
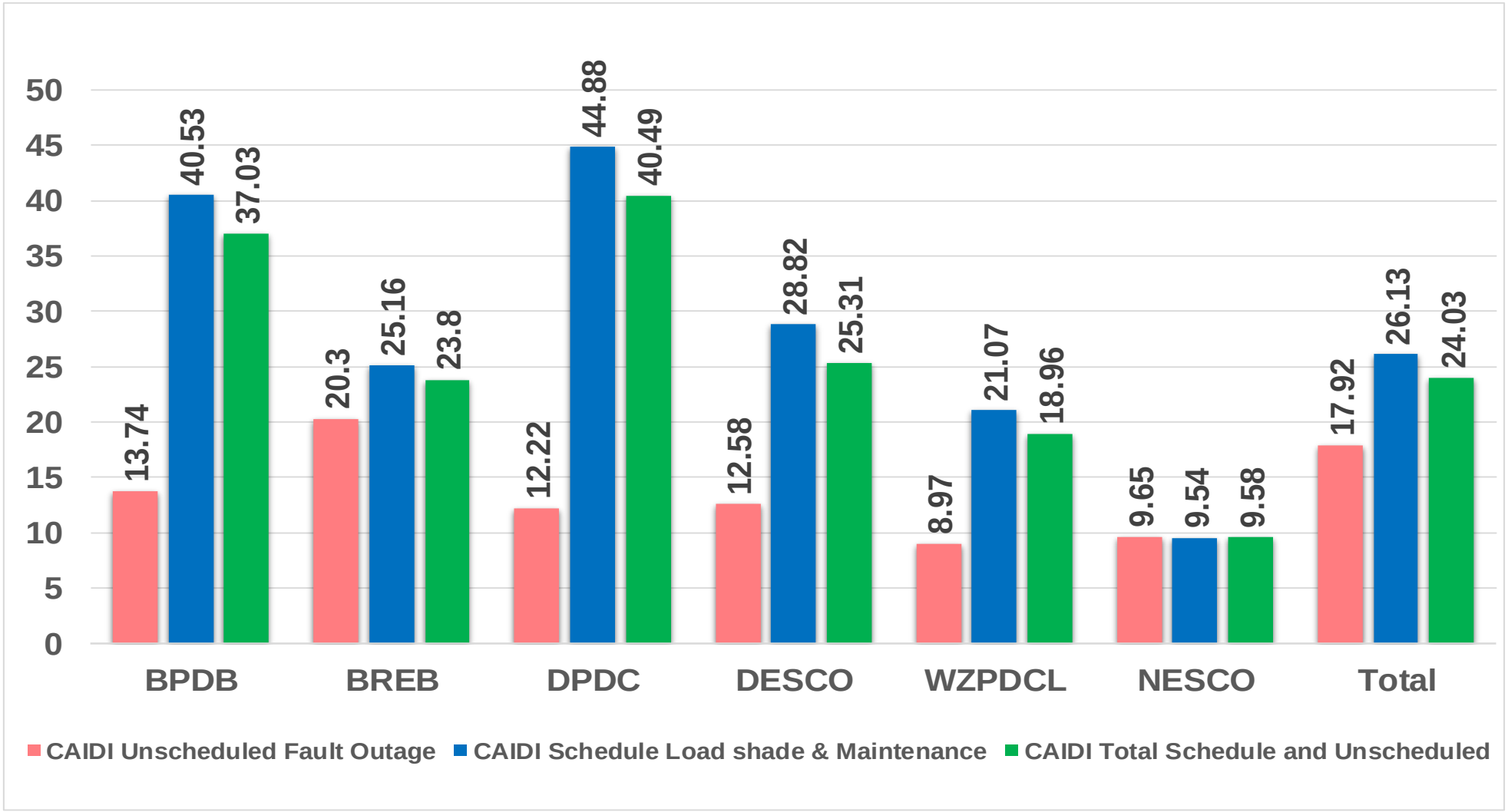


FIGURE-63: SUMMARY OF UTILITY-WISE CAIDI
(YEAR: JULY 2022- APRIL 2023)



5.3 OBSERVATIONS ON SAIDI AND SAIFI OF ALL UTILITIES UNDER POWER DIVISIONS

To verify the collected data of SAIDI and SAIFI from the six utilities for the FY 2019-2020, FY 2020-2021, FY 2021-2022, and 2022-2023 (up to March 2023) and critically analysed the same to derive the required results. To know the target vs achievement of SAIFI and SAIDI of each utility for the FY 2019-2020, FY 2020-2021, FY 2021-2022, and FY 2022-2023 checked the analytical results, generated analytical data tables and drawn the results figures. It is coming out from the analysis that SAIDI and SAIFI are improving in the FY 2019-2020 and FY 2020-2021 while the SAIDI and SAIFI value are increasing in the FY 2021-2022 and FY 2022-2023 (till March 2023). But these are within the range of fixed target. The t**able-94 to 97** and **Figure-64 to 67** below showcase the targets set and the achievements of each utility.

Details of **figure-64 to 67** and **table-94 to 97** are given bellow.

TABLE-94: CALCULATION OF SAIDI AND SAIFI FOR FY 2019-20 (JULY 2019 - JUNE 2020)

Name of the Organization/Company	Targets of SAIDI	Targets of SAIFI	Total Number of consumers served (Nt)	Total Number of Customers Interrupted (ΣNi Fi)	Customer Interruption Durations (Σ Ni Ti)	SAIDI	SAIFI
0	1	2	3	4	5	6	7
BPDB	750	50	3,222,846	156,050,203	2405016599	746.2	48.42
BREB	1350	50	28,900,000	1,386,044,000	38351456000	1,327.0	47.96
DPDC	370	20	1,357,076	23,424,387	311,952,028	229.9	17.26
DESCO	370	14	1,001,799	13,796,025	367,937,273	367.3	13.77
NESCO	450	40	1,566,104	52,464,484	482,829,863	308.3	33.50
WZPDCL	400	20	1,216,288	21,628,362	404,241,484	332.4	17.78
Annual Average			37,264,113	1,653,407,461	42,323,433,247	1,135.8	44.37

FIGURE-64: TARGETS CALCULATION OF SAIDI
(YEAR: JULY 2019-JUNE 2020)

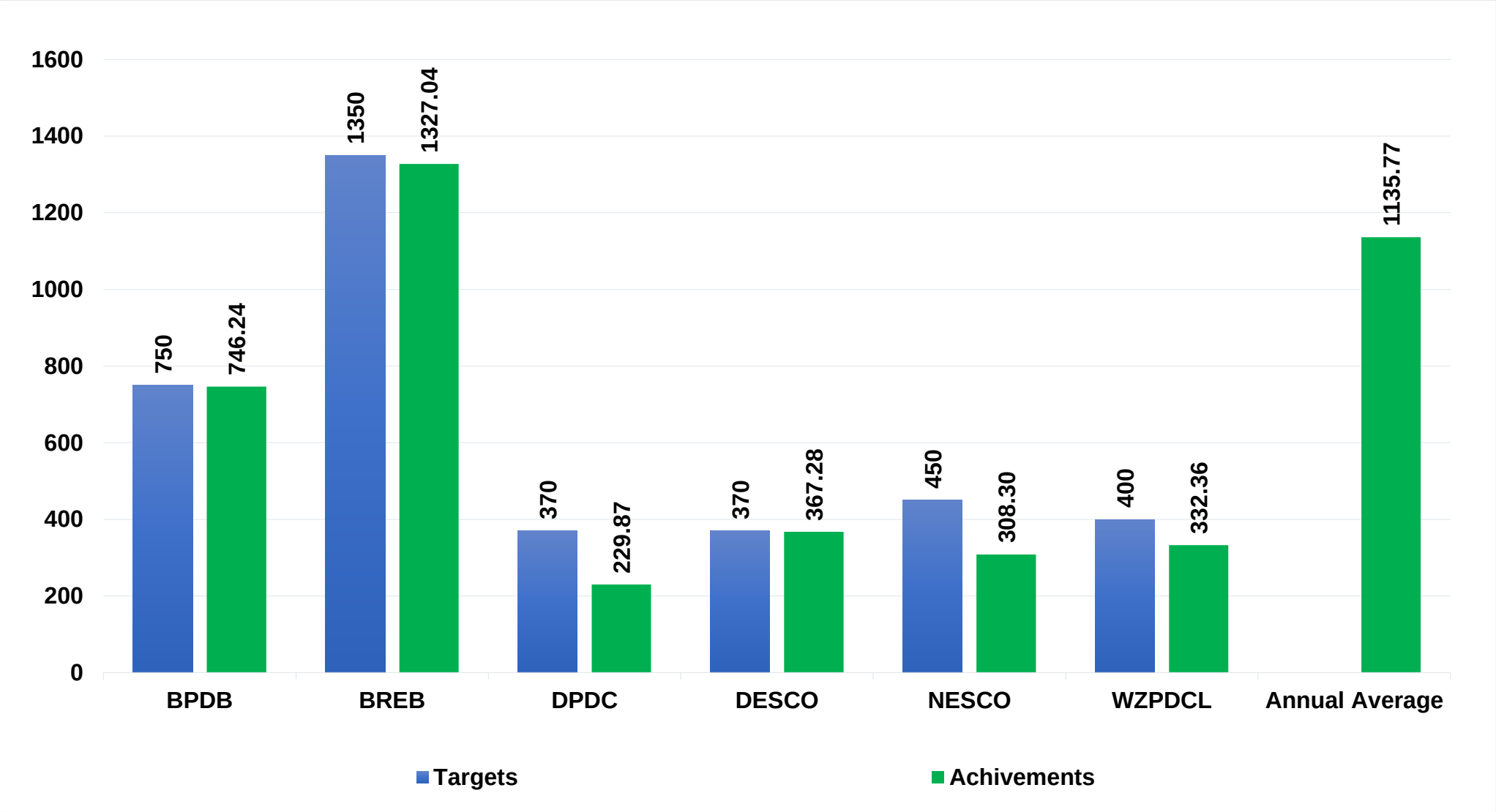


FIGURE-65: TARGETS CALCULATION OF SAIFI
(YEAR: JULY 2019-JUNE 2020)

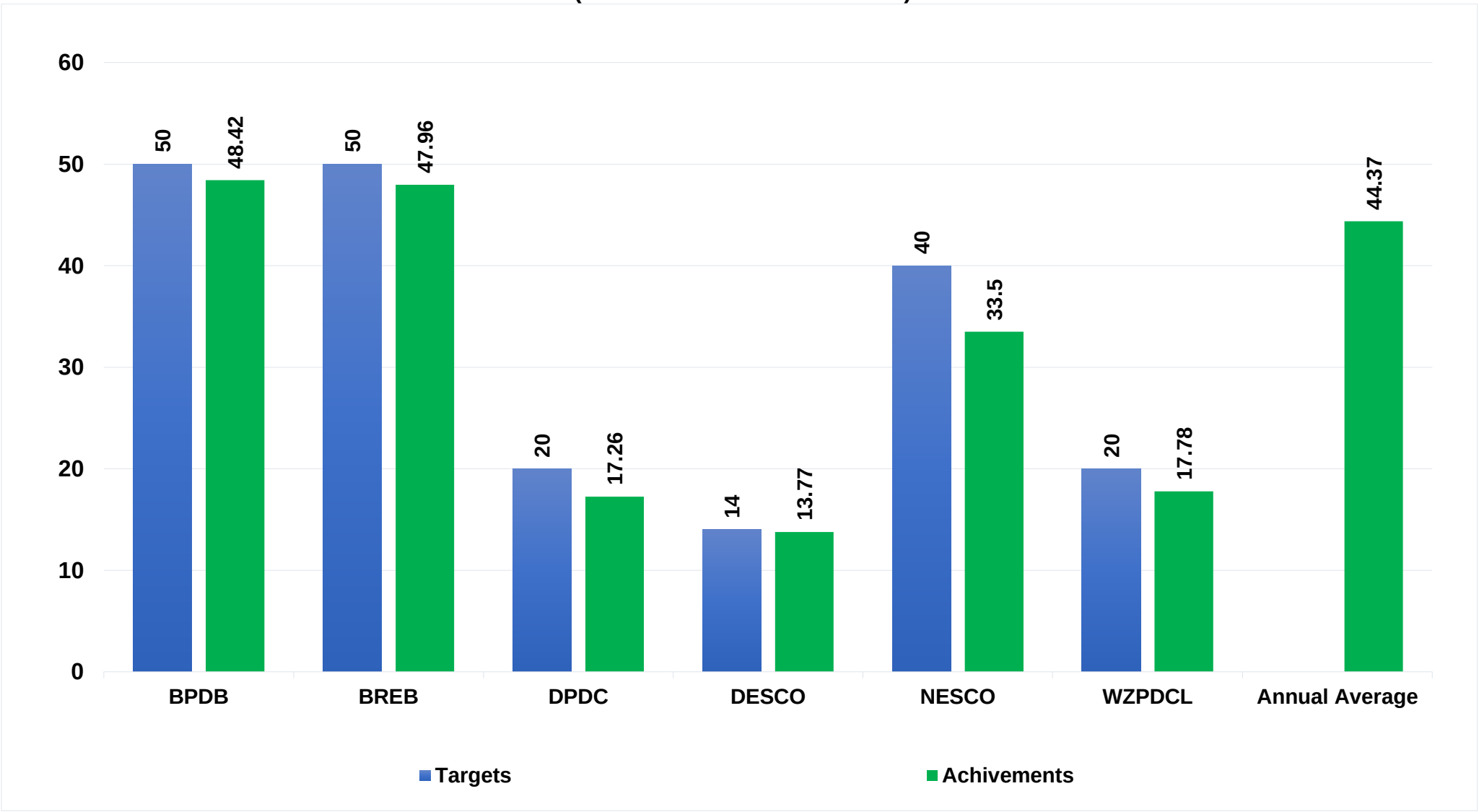


TABLE-95: SAIDI AND SAIFI FOR FY 2020-21
(JULY 2020-JUNE 2021)

Name of the Organization/Company	Targets of SAIDI	Targets of SAIFI	Total Number of consumers served (Nt)	Total Number of Customers Interrupted (ΣNi Fi)	Customer Interruption Durations (Σ Ni Ti)	SAIDI	SAIFI
0	1	2	3	4	5	6	7
BPDB	750	50	3,438,855	163,173,670	2,568,824,685	747.00	47.45
BREB	1300	45	31,693,774	1,362,832,282	40,029,236,562	1,263.00	43.00
DPDC	365	20	1,426,275	27,555,908	345,306,900	242.10	19.32
DESCO	360	14	1,076,000	14,081,232	336,148,361	312.41	13.09
NESCO	420	36	1,685,659	55,550,722	669,840,176	397.38	32.95
WZPDCL	400	20	1,313,960	23,207,444	434,931,778	331.01	17.66
Annual Avg	1100	n/a	40,634,523	1,646,401,258	44,384,288,462	1,092.28	40.52

FIGURE-66: TARGETS CALCULATION OF SAIDI (JULY 2020-JUNE 2021)

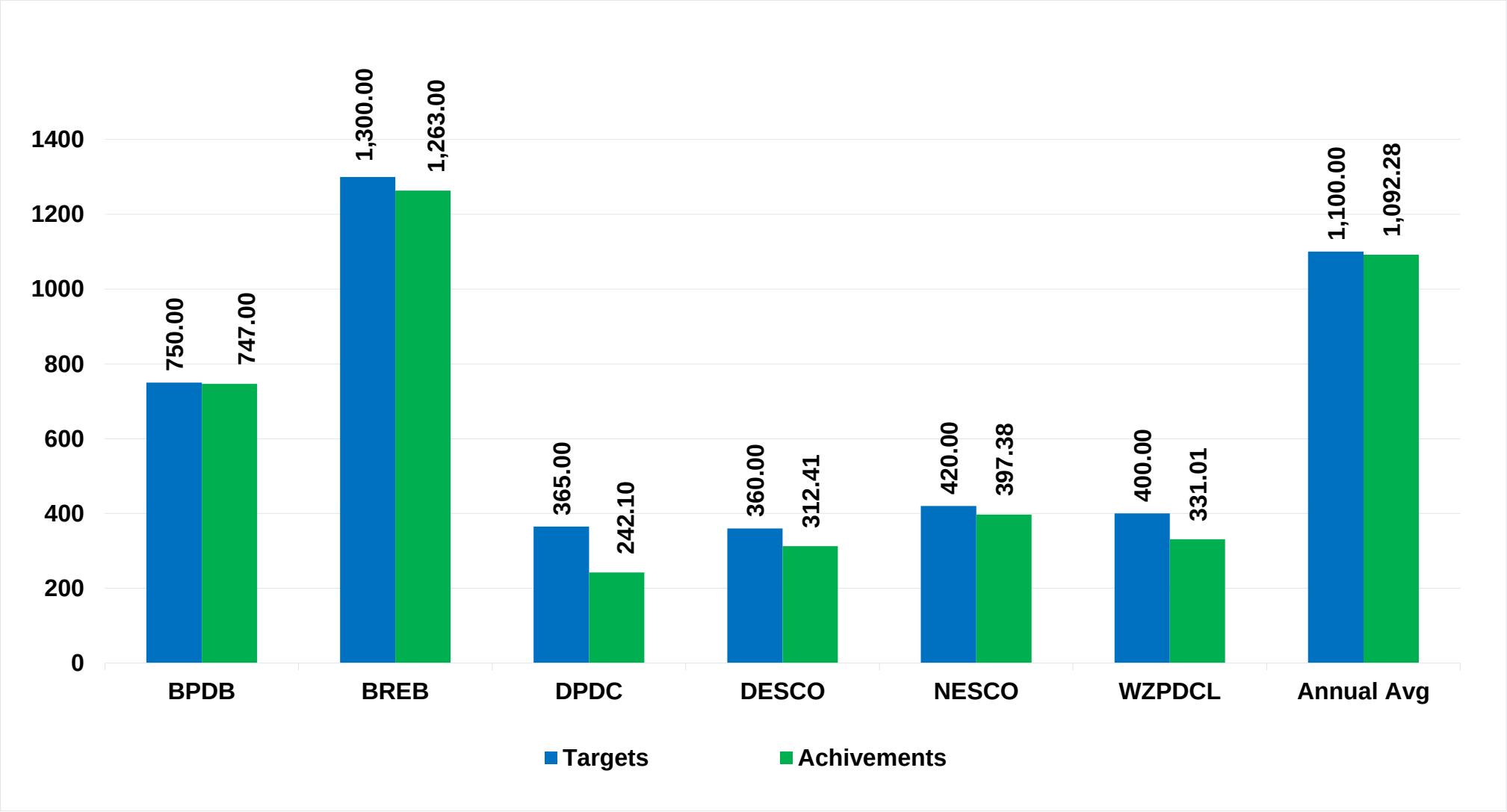


FIGURE-67: TARGETS CALCULATION OF SAIFI (JULY 2020-JUNE 2021)

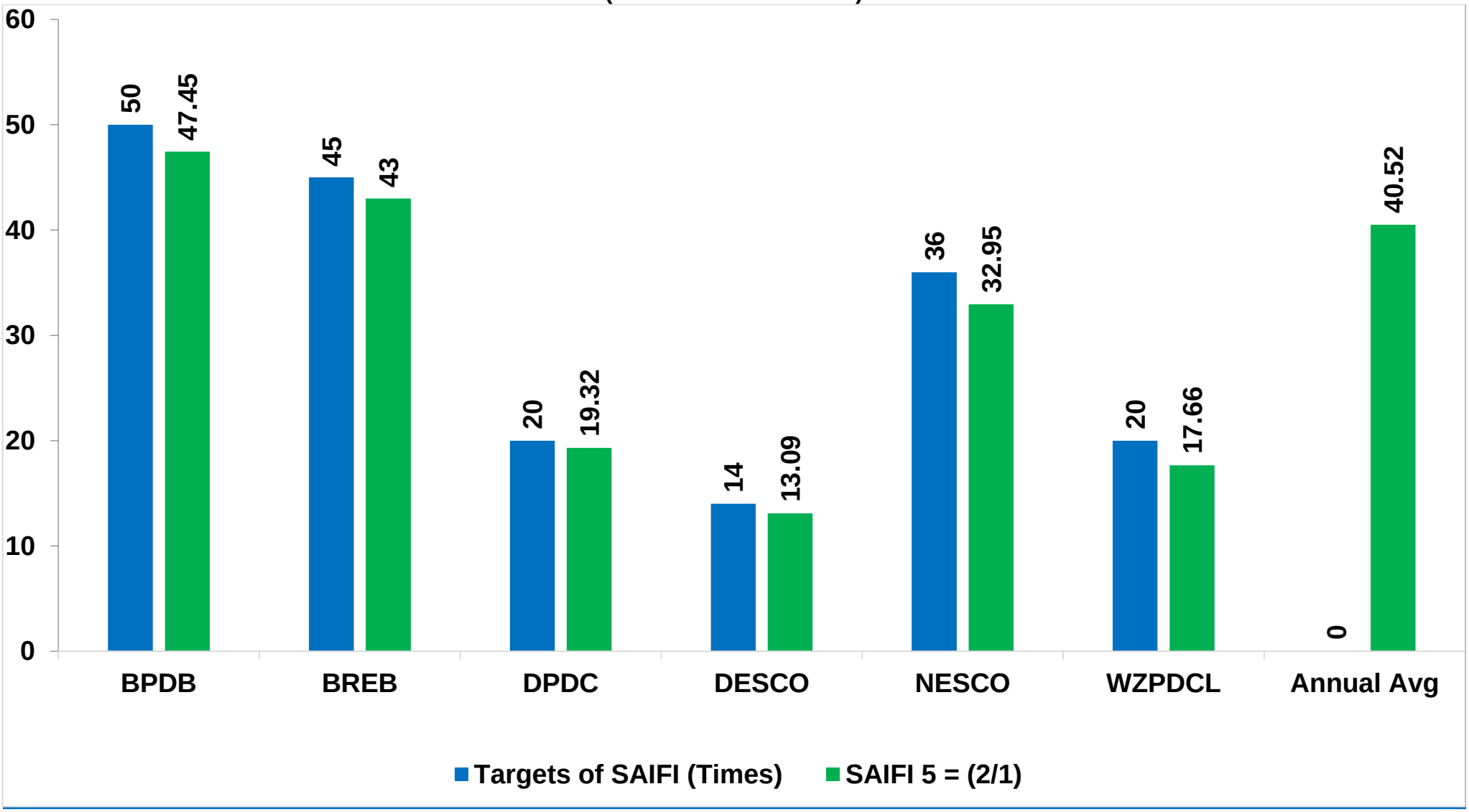


TABLE-96: SAIDI AND SAIFI FOR FY 2021-22
(JULY 2021 – JUNE 2022)

Name of the Organization/Company	Targets of SAIDI	Targets of SAIFI	Total Number of consumers served (Nt)	Total Number of Customers Interrupted (ΣNi Fi)	Customer Interruption Durations (Σ Ni Ti)	SAIDI	SAIFI
0	1	2	3	4	5	6	7
BPDB	745	45	3,634,641	159,924,204	2,696,903,622	742.00	44.00
BREB	1250	42	33,563,804	1,385,178,191	40,947,840,880	1,220.00	41.27
DPDC	700	70	1,533,175	83,917,122	947,854,898	618.23	54.73
DESCO	500	25	1,155,650	25,488,477	526,950,539	455.98	22.06
NESCO	600	60	1,813,988	100,029,461	1,045,510,894	576.36	55.14
WZPDCL	800	80	1,399,043	107,325,183	1,106,209,310	790.69	76.71
Annual Avg	1050	n/a	43,100,301	1,861,862,638	47,271,270,143	1,096.77	43.20

FIGURE-68: TARGETS CALCULATION OF SAIDI
(YEAR: JULY 2021-JUNE 2022)

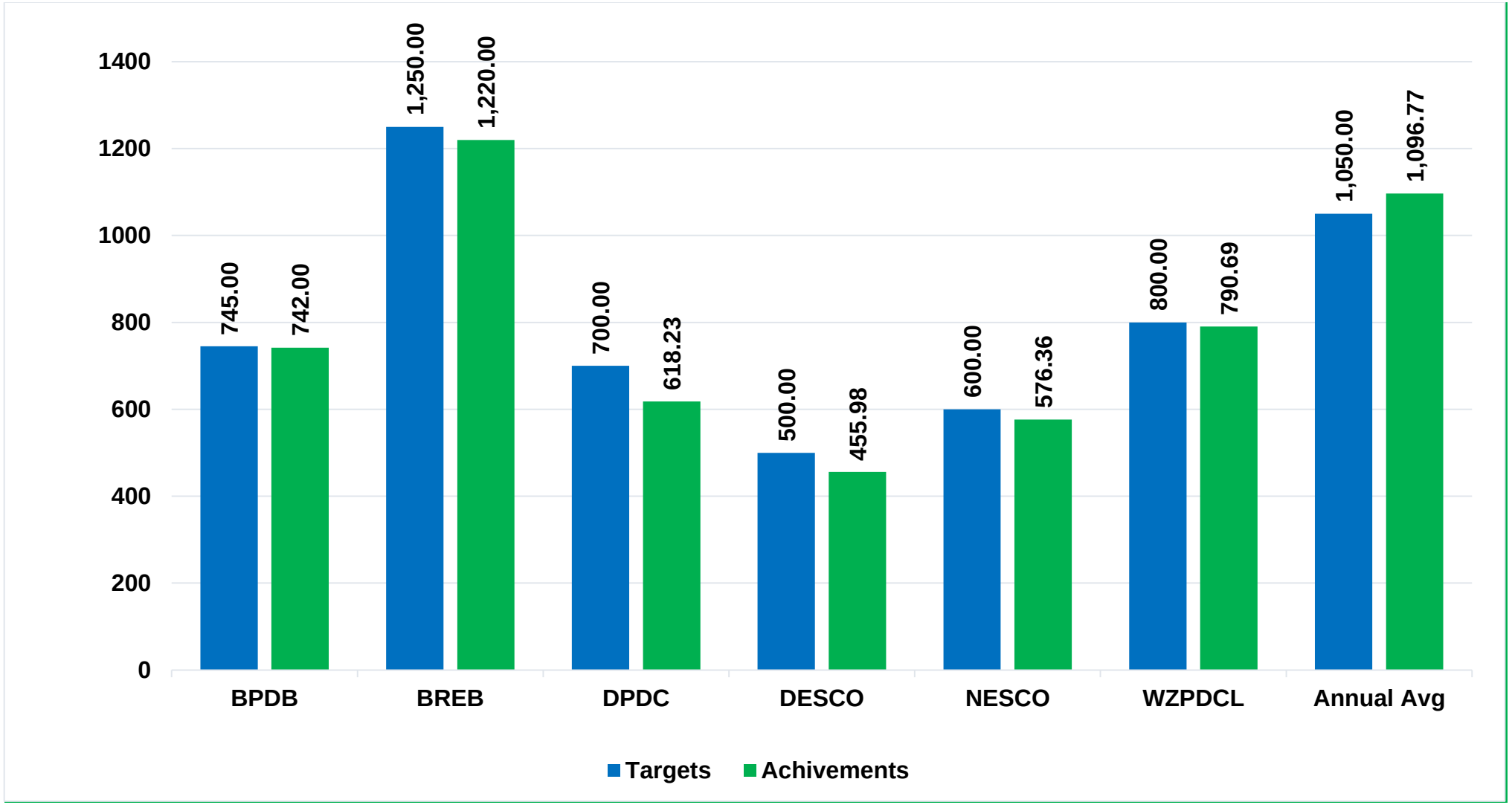


FIGURE-69: TARGETS CALCULATION OF SAIFI
(YEAR: JULY 2021-JUNE 2022)

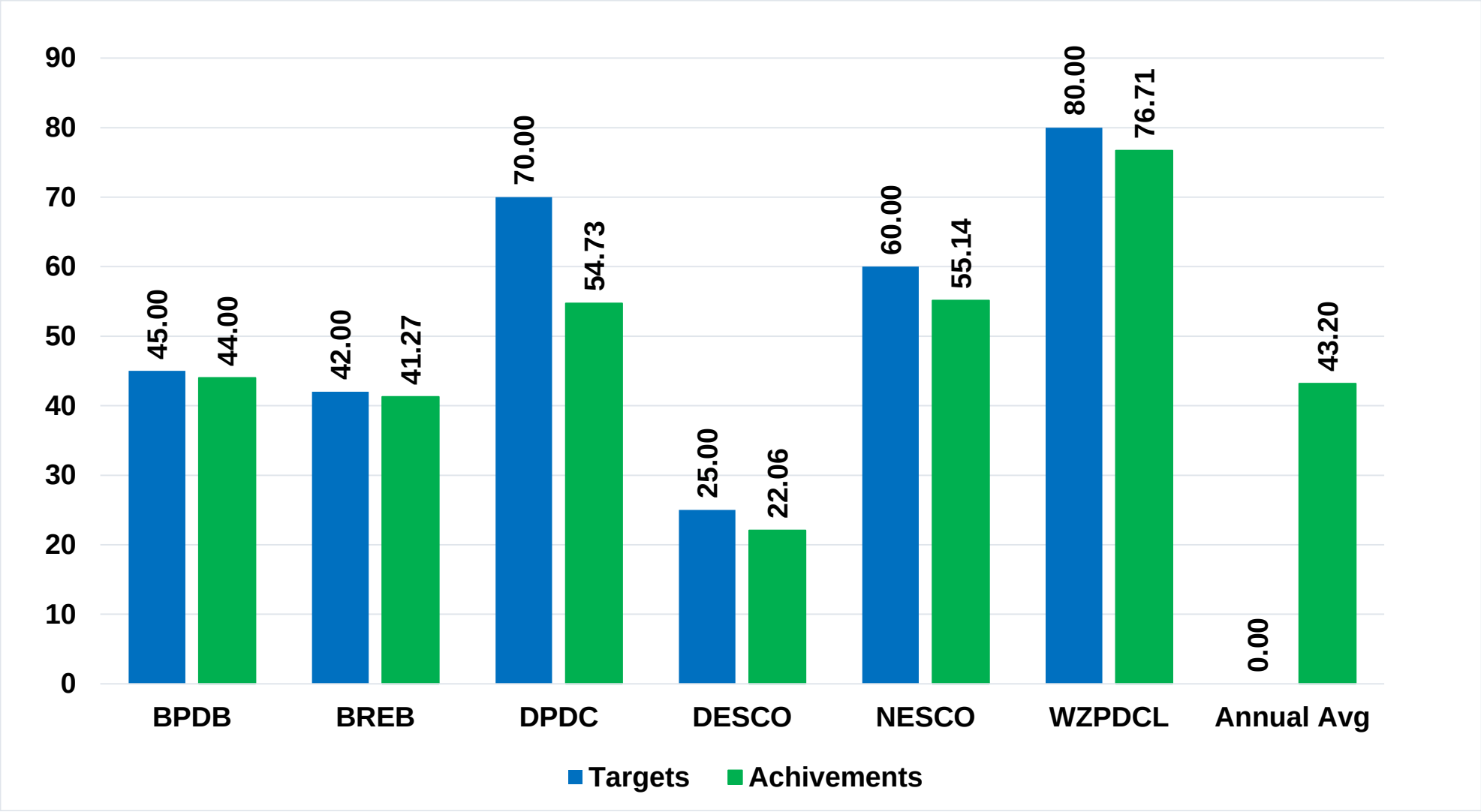


TABLE-97: SAIDI AND SAIFI FOR FY 2022-23
(JULY 2022 TO MARCH 2023)

Name of the Organization/Company	Targets of SAIDI	Targets of SAIFI	Total Number of consumers served (Nt)	Total Number of Customers Interrupted (ΣNi Fi)	Customer Interruption Durations (Σ Ni Ti)	SAIDI	SAIFI
0	1	2	3	4	5	6	7
BPDB	1240	45	3,889,109	126,396,043	3,152,122,845	810.50	32.50
BREB	1760	50	34,525,522	1,242,918,792	42,673,545,192	1,236.00	36.00
DPDC	1390	95	1,618,396	67,082,386	908,647,635	561.45	41.45
DESCO	1420	25	1,208,500	40,111,590	607,515,857	502.70	33.19
WZPDCL	1440	95	1,496,850	98,627,447	1,120,567,879	748.62	65.89
NESCO	1370	60	1,892,905	81,394,915	1,677,113,830	886.00	43.00
Annual Avg	1850	n/a	44,631,282	1,656,531,173	50,139,513,238	1,123.42	37.12

FIGURE-70: TARGETS CALCULATION OF SAIDI
(YEAR: JULY 2022 – MARCH 2023)

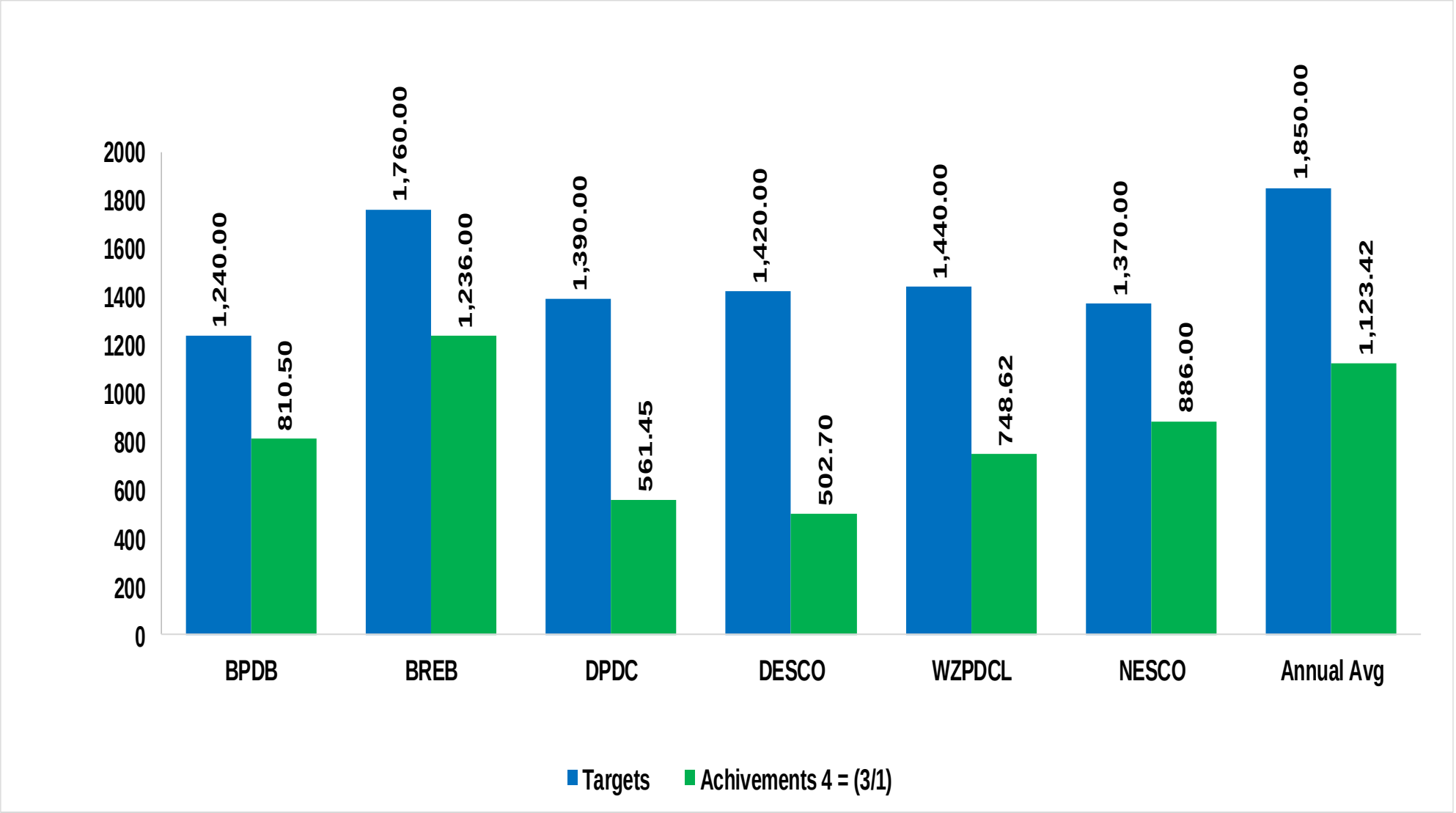
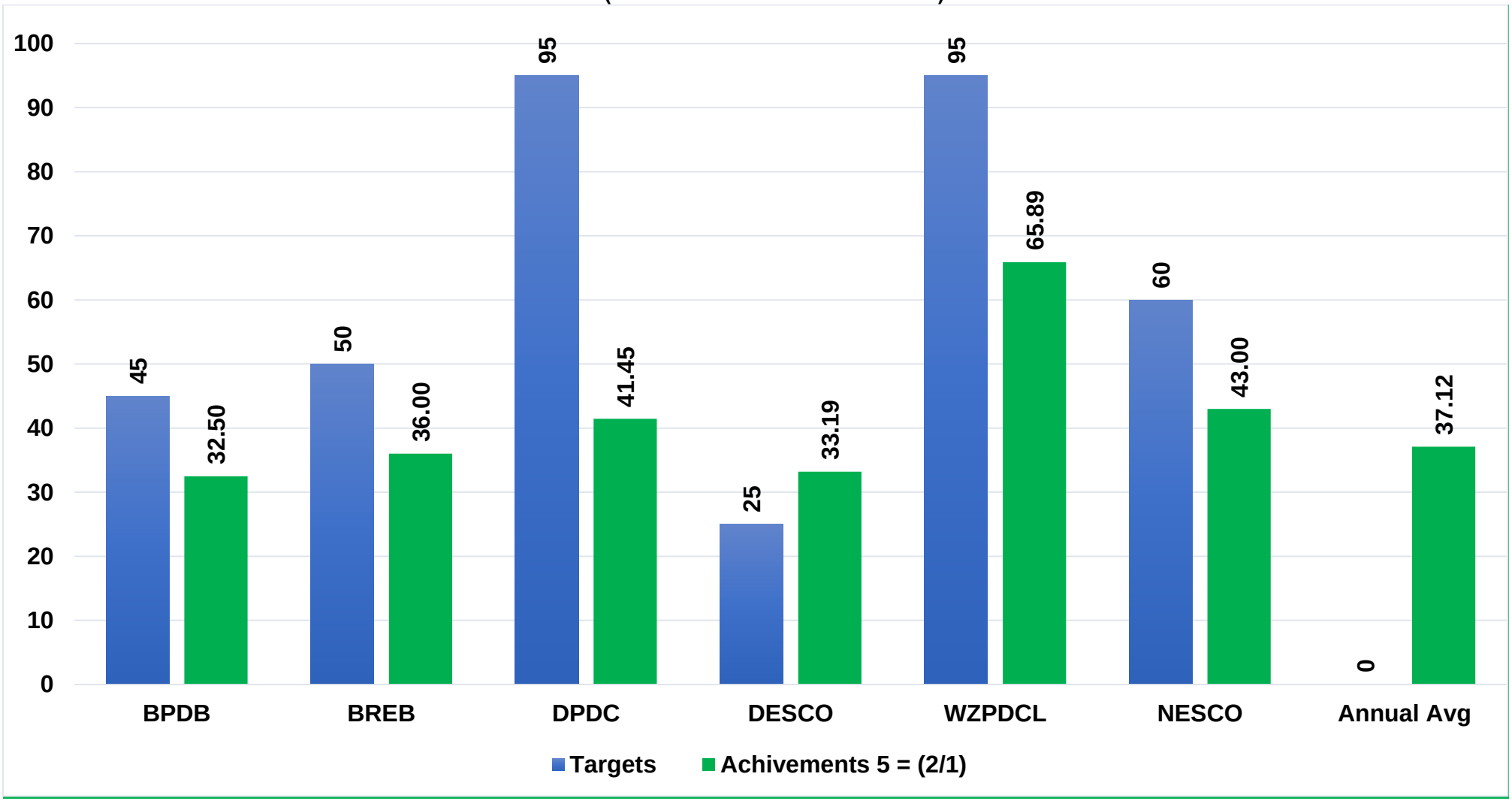


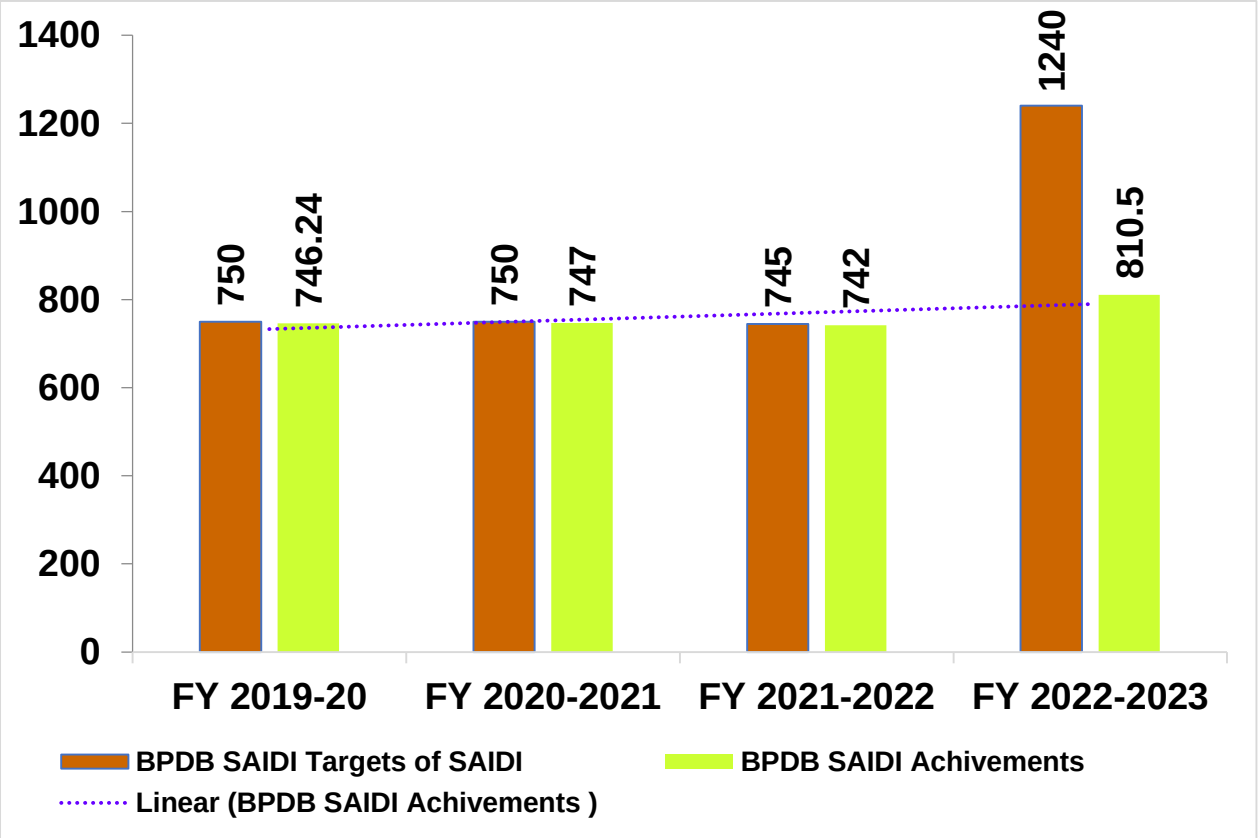
FIGURE-71: TARGETS CALCULATION OF SAIFI (YEAR: JULY'22 – MARCH'23)



BPDB: SAIDI

The **Figure-72** illustrated the targets and achievements of SAIDI for the BPDB over a period of four fiscal years, which are FY 2019-20, FY 2020-2021, FY 2021-2022, and FY 2022-2023. In FY 2019-20, the target for SAIDI was 750 minutes per customer, and the actual achievement was 746.24 minutes per customer, which indicates, on average, customers observed power outages 746.24 minutes per customers (approximate) during that fiscal year. In FY 2020-2021, the SAIDI target remained the same at 750 minutes per customer, and the achievement was 747 minutes per customer. This suggests that the average duration of power outages is a little bit higher than the previous year. In FY 2021-2022, the target of the SAIDI was reduced to 745 minutes per customer, and the achievement was 742 minutes per customer. This indicates a slight improvement in the average duration of power outages compared to the previous fiscal year. In FY 2022-2023, the SAIDI target remarkably increased to 1240 minutes per customer, where the achievement was 810.5 minutes per customer. It can be seen that, there are many trends, which is illustrated in the drawn figure: upward and downward. Although, it is indicated that, the achievements are within the target limit. **The details are shown in Figure-72:**

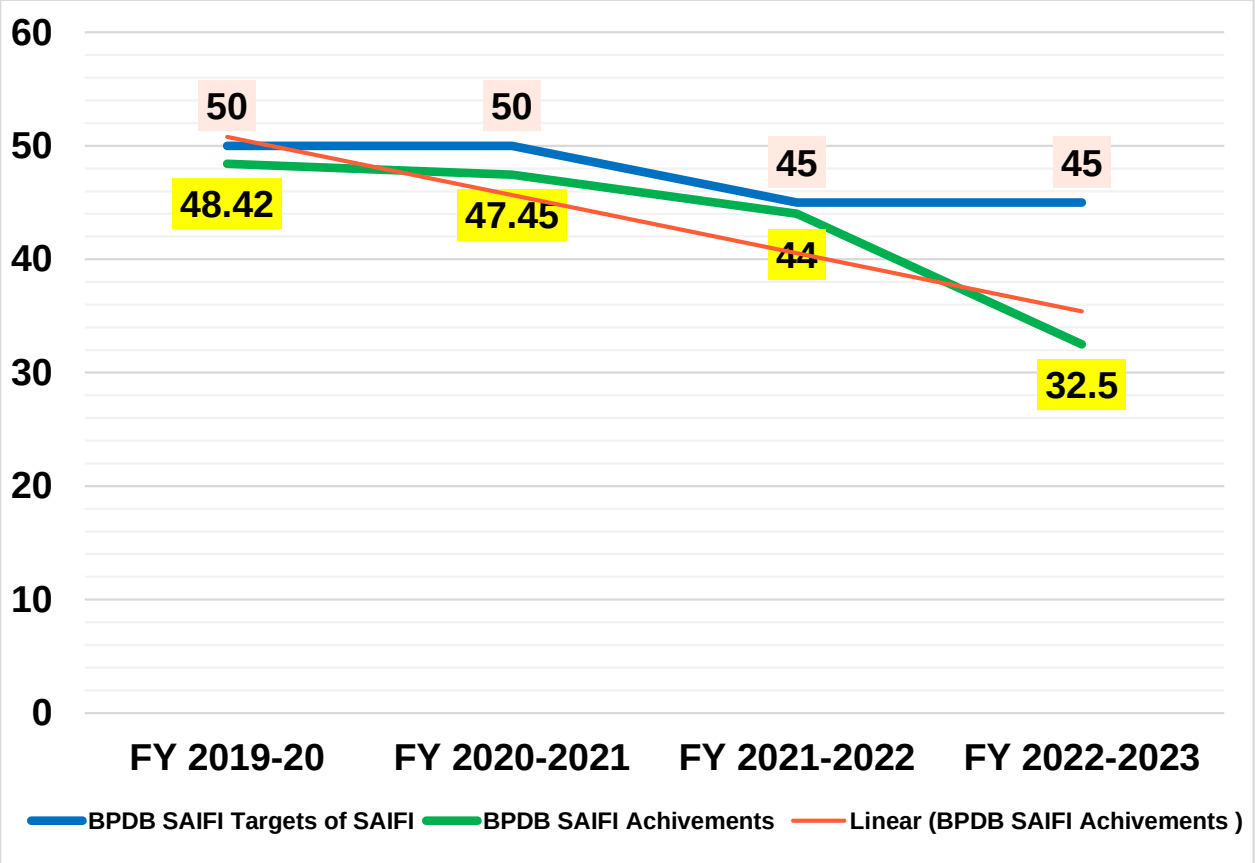
FIGURE-72: BPDB- TARGET-ACHIEVEMENT OF SAIDI WITH ACHIEVEMENT TREND LINE



BPDB: SAIFI

The **Figure-73** shows the targets and achievements of SAIFI of BPDB for the following fiscal year- FY 2019-20, FY 2020-2021, FY 2021-2022, and FY 2022-2023. In FY 2019-20, the target of SAIFI was 50 outages per customer, and the existent achievement was 48.42 outages per customer. Consequently, on the average, customers experienced 48.42 power outages per customer (approximate) during the aforesaid fiscal year. In FY 2020-2021, the target of the SAIFI remained the same at 50 outages per customer, and the achievement was 47.45 outages per customer. This indicates a steady improving in the average number of power outages. From FY 2021-2022, the SAIFI target was fixed to 45 outages per customer, and the achievement was 44 outages per customer, which also indicates a continued improving in the average frequency of power outages per customer. In the last FY 2022-23, the SAIFI target was remained at 45 outages per customer, and the achievement was 32.5 outages per customer in 9 months of the period (July 22 to March 23). This indicates that the average number of power outages per customer was considerably progressed compared to the previous years. The achievements of the SAIFI of BPDB were alleviated for the fiscal year- FY 2019-20, FY 2020-2021, FY 2021-2022, and FY 2022-2023. The average number of power outages per customer were indicated the growth of the reliability of power supply system. The details are shown in **Figure-73:**

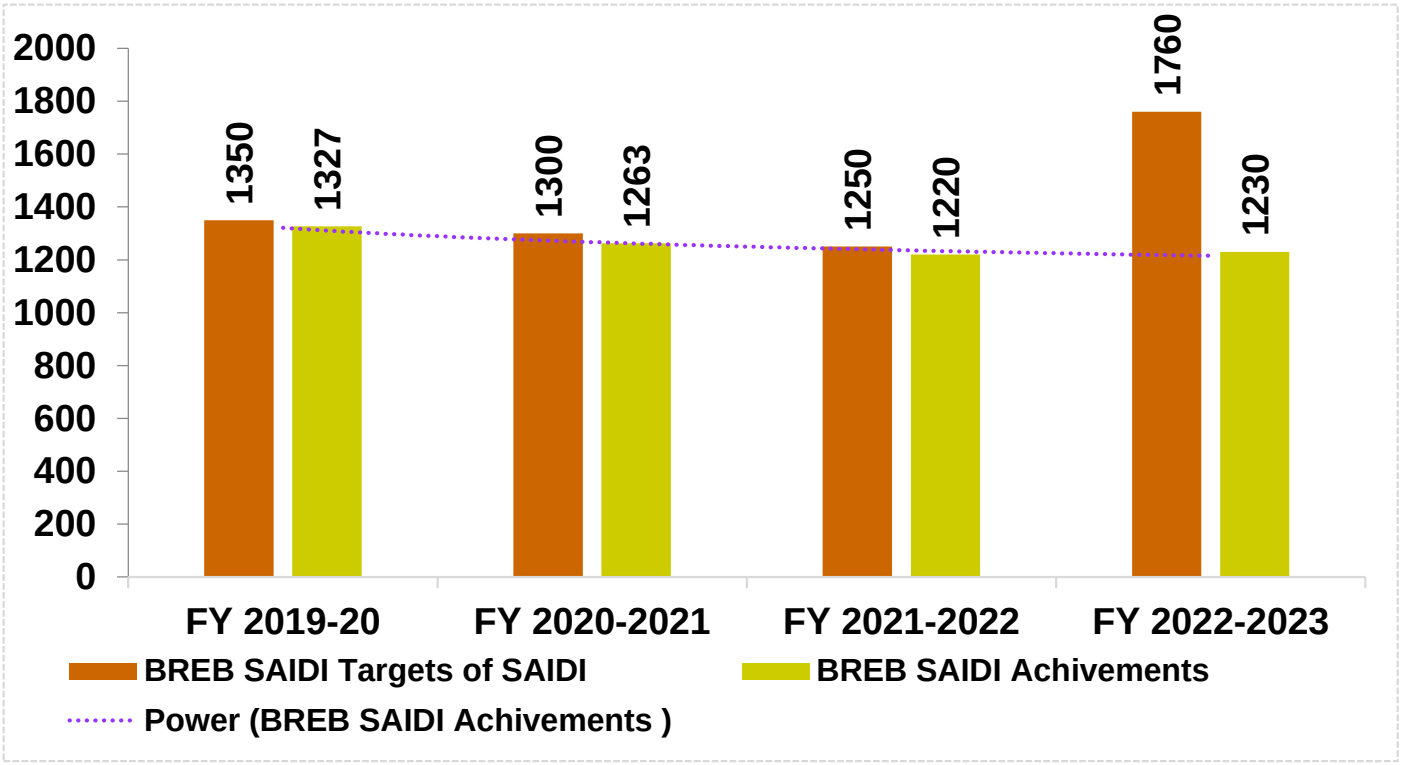
FIGURE-73: BPDB- TARGET-ACHIEVEMENT OF SAIFI WITH ACHIEVEMENT TREND LINE



BREB: SAIDI

The **Figure-74** shows that, the targets and achievements of SAIDI of BREB for the fiscal years- FY 2019-20, FY 2020-2021, FY 2021-2022, and FY 2022-2023. The target of SAIDI for the FY 2019-20 was 1350 minutes per customer and the achievement was 1327 minutes per customer, which indicates that the achievement was descending than the target. In the FY 2020-2021, the target of SAIDI was decline to 1300 minutes per customer, as well as the achievements was 1263 minutes per customer, which indicates that the achievement was improving. Subsequently, in the FY 2021-2022, the SAIDI target was falling down to 1250 minutes per customer, and the achievement was 1220 minutes per customer, which means that the average duration of power outages per customer is advancing continuously. Finally, in the FY 2022-2023, the SAIDI target increased significantly to 1760 minutes per customer, while the achievement was only 1230 minutes per customer in nine months (July 2022- March 2023). This indicates that the average of power outages per customer was higher compared to the previous year, which was within the target limit. The data trend line of SAIDI states the improvement of the average duration of power outages per customer. The analysis shows that, the results of the power supply system is improved. The details are provided in **figure-74:**

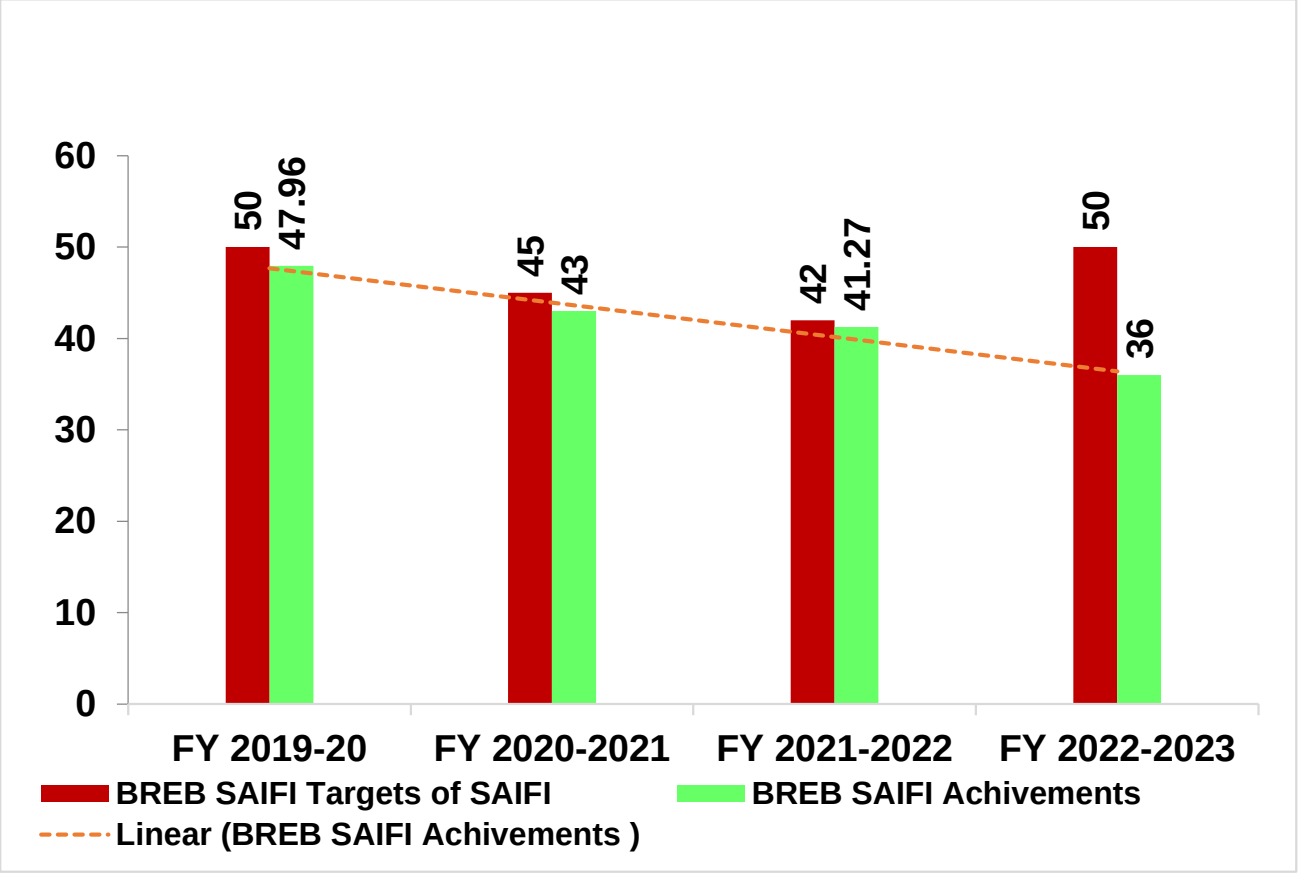
FIGURE-74: BREB- TARGET-ACHIEVEMENT OF SAIDI WITH ACHIEVEMENT TREND LINE



BREB: SAIFI

The **Figure-75** states that the targets and achievements of SAIFI of BREB for the fiscal year- FY 2019-20, FY 2020-2021, FY 2021-2022, and FY 2022-2023. In the first FY 2019-2020, the target of the SAIFI was 50 outages per customer, on the other hand the actual achievement was 47.96 outages per customer, which is indicating decline slightly the average number of power outages per customer compare to the target. Consequently, the target of SAIFI was fixed to 45 interruptions per customer. The achievement was 43 outages per customer, which is the improvement in decreasing the average number of interruptions per customer. Thirdly, In FY 2021-2022, the SAIFI target was lowered to 42 interruptions per customer, as well as the achievement was 41.27 interruptions per customer, which indicates the steady progress in reducing the average number of interruptions per customer. Finally, in FY 2022-2023, the target of SAIFI Increased to 50 interruptions per customer, while the achievement was 36 interruptions per customer in nine months from July 2022 to march 2023. There is significant advancement in mitigating the average number of power interruptions as compare to the set target. However, this trend figure of BREB suggests a reformation of interruptions over the FY 2022-2023. The details are shown in **Figure-75.**

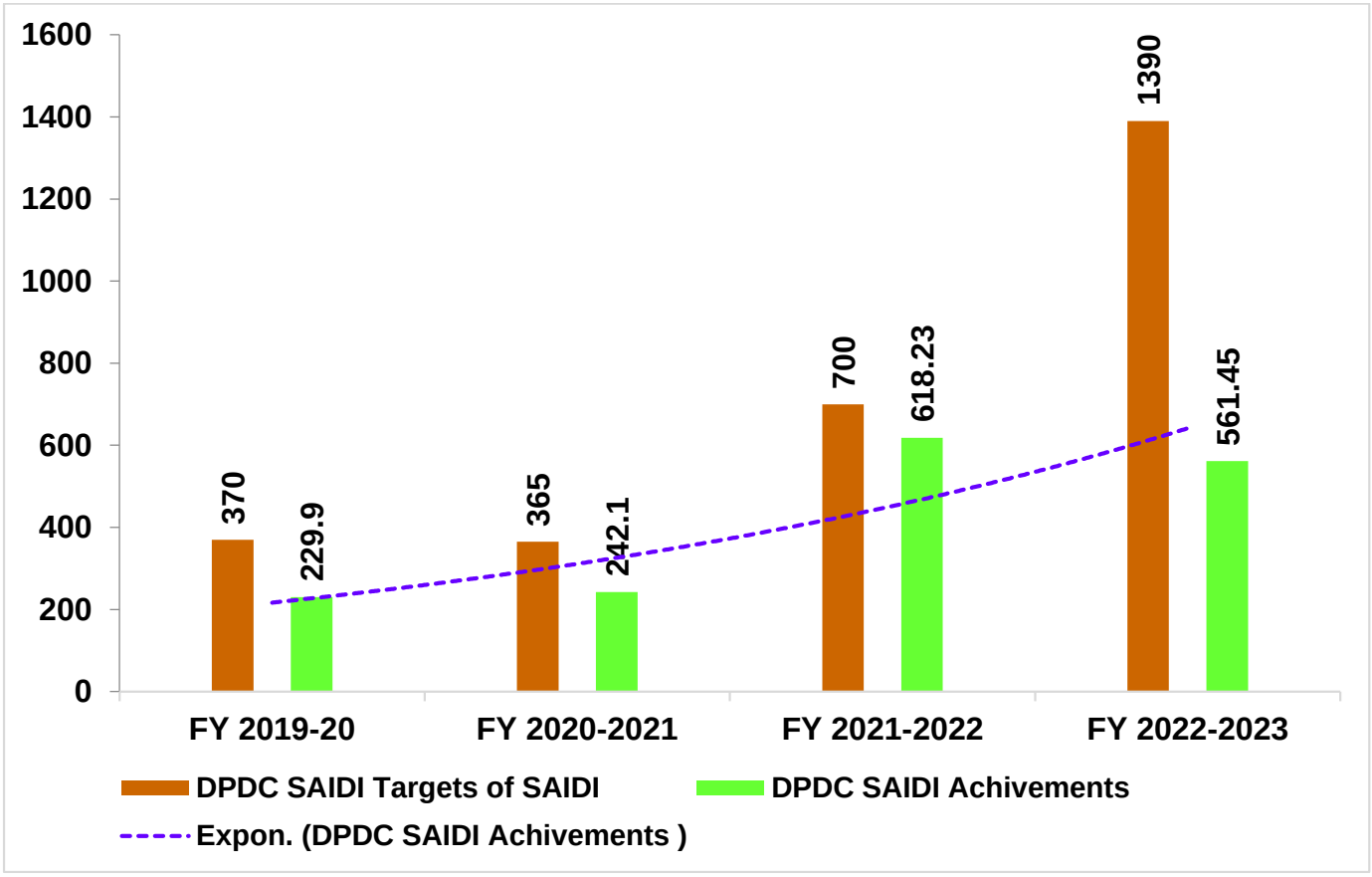
FIGURE-75: BREB- TARGET-ACHIEVEMENT OF SAIFI WITH ACHIEVEMENT TREND LINE



DPDC- SAIDI

The **Figure-76** represents the targets and achievements of SAIDI of DPDC for the years FY 2019-20, FY2020-2021, FY 2021-2022, and FY 2022-2023. In the FY 2019-20, the achieved of SAIDI value is 229.9 minutes per customer, which is declined than the target. Although interruptions of SAIDI's target is 370 minutes per customer. In FY 2020-2021, the achievement of SAIDI was 242.1 minutes per customer, which is elevated than the previous year. Although, it remained below the target, where target of SAIDI was 365 minutes per customer. Moving on the FY 2021-2022 and the achievement of SAIDI value is significantly decline than the set target. The achievements of the SAIDI value are 618.23 minutes per customer. Moreover, the target of SAIDI value is 700 minutes per customer. The results of SAIDI are lower duration of outages. In FY 2022-2023, the achieved of SAIDI value is lower than the set target, where the target was 1390 minutes per customer and the achievements was 561.45 minutes per customer in nine months from July 2022 to March 2023. Although the target is higher than the previous year. It is mention that the achievements trend indicates the upward but still below the target limit. The details are shown in **figure-76.**

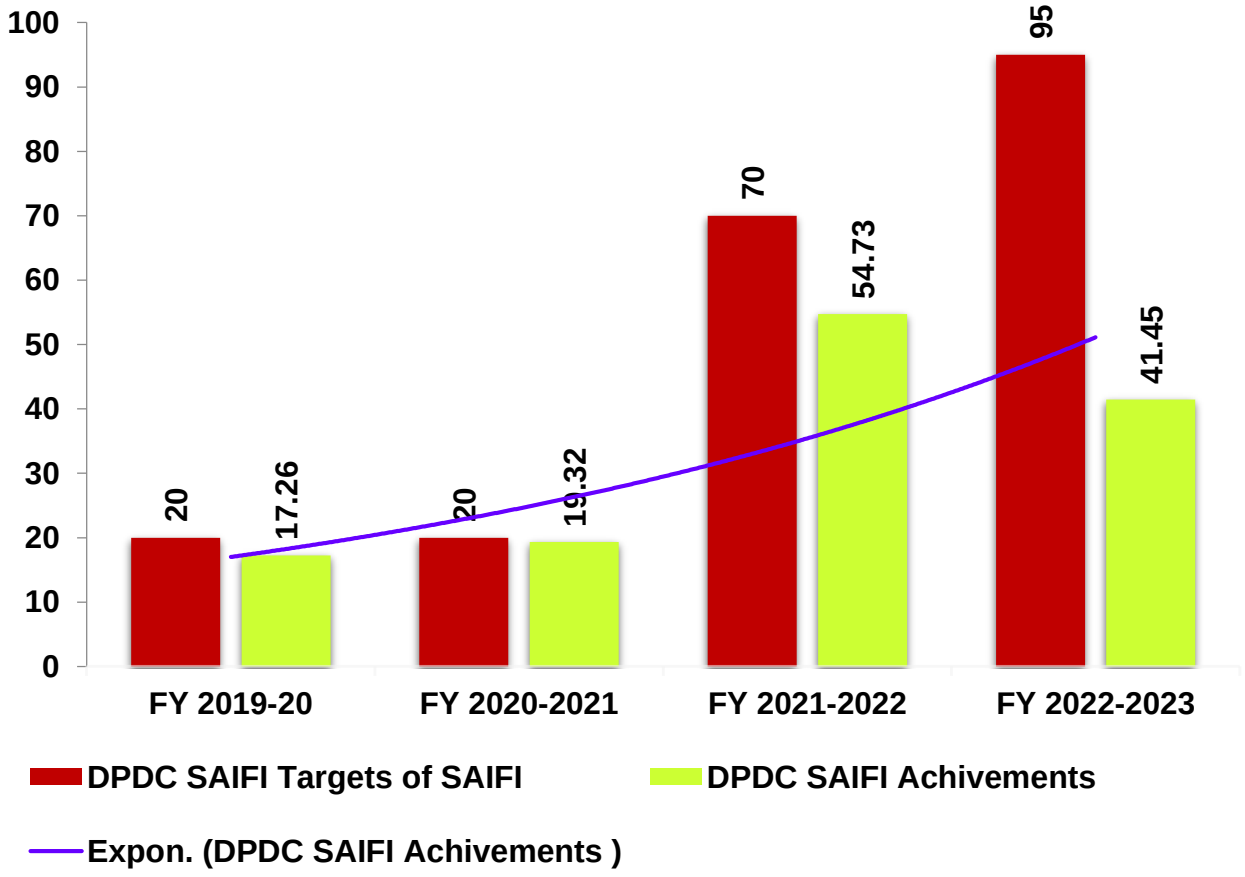
FIGURE-76: DPDC- TARGET-ACHIEVEMENT OF SAIDI WITH ACHIEVEMENT TREND LINE



DPDC: SAIFI

The **Figure-77** shows that the target and achievement of SAIFI of DPDC for the fiscal years-FY 2019-20, FY 2020-21, FY 2021-22 and FY 2022-23 (Till March 2023). In FY 2019-20, the set target of SAIFI was 20 interruptions per customer, where the achievement was 17.26 interruptions per customer. In FY 2020-2021, the target was almost the same, but the achievement increased to 19.32 interruptions per customer. On the other hand, In FY 2021-2022, the target was upward to 70 interruptions per customer. At this time the achievement of SAIFI was 54.73 interruptions per customer. In the FY 2022-2023, the target of the SAIFI was also in the upward position, which was 95 interruptions per customer and at the same time, the achievement was 41.45 interruptions per customer in nine months from July 2022 to March 2023. The trend line of the figure-76 shows the upward direction, which indicates the increased trend of interruptions number per customer. But the SAIFI value is within the target limit, because of setting the higher target value. The details are shows in **Figure-77**.

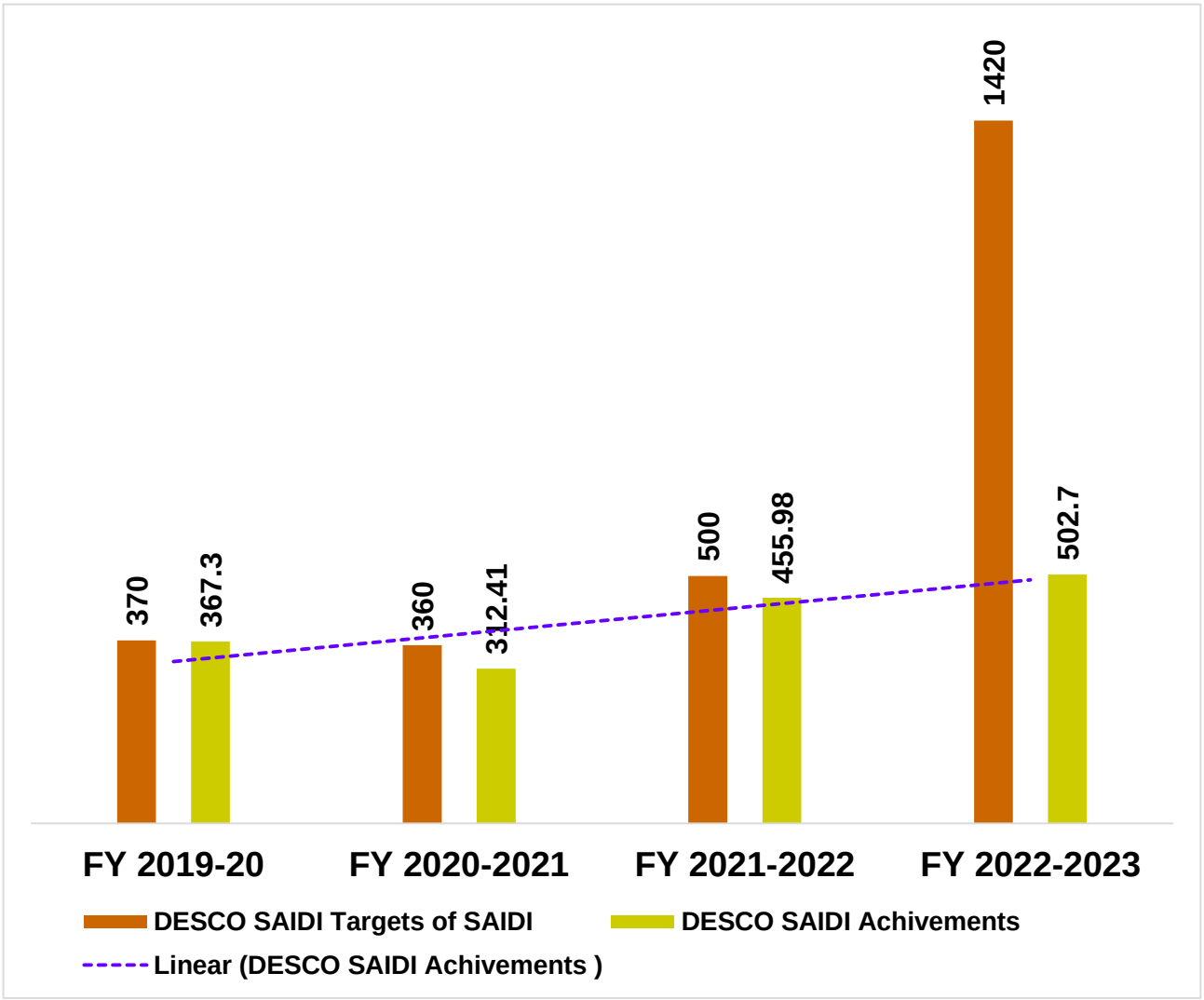
FIGURE-77: DPDC- TARGET-ACHIEVEMENT OF SAIFI WITH ACHIEVEMENT TREND LINE



DESCO: SAIDI

The **Figure-78** shows that the target and achievement of SAIFI of DPDC for the fiscal years-FY2019-20, FY2020-21, FY2021-22 and FY2022-23 (Till March 2023). In FY 2019-20, the target of SAIDI was 370 minutes per customer and the achievement of SAIDI was 367.3 minutes per customer, which is a declined trend. Consequently, In FY 2020-2021, the target of SAIDI was 360 minutes per customer as well as the achievements was 312.41 minutes per customer, which was below the target limit. For the FY 2021-2022, the target of SAIDI was 500 minutes per customer although, the trend was upward and achievement at 455.98 minutes per customer, which is within the target limit but higher than the previous year. In the next FY 2022-2023, the target of SAIDI was 1420 minutes per customer and achievement was 502.7 minutes per customer in nine months from July 2022 to March 2023. It is also mentioned that SAIDI is higher than the previous year. The trend figure shows an upward but within the target limit due to fixed up a higher target value. The details are shown at **Figure-78.**

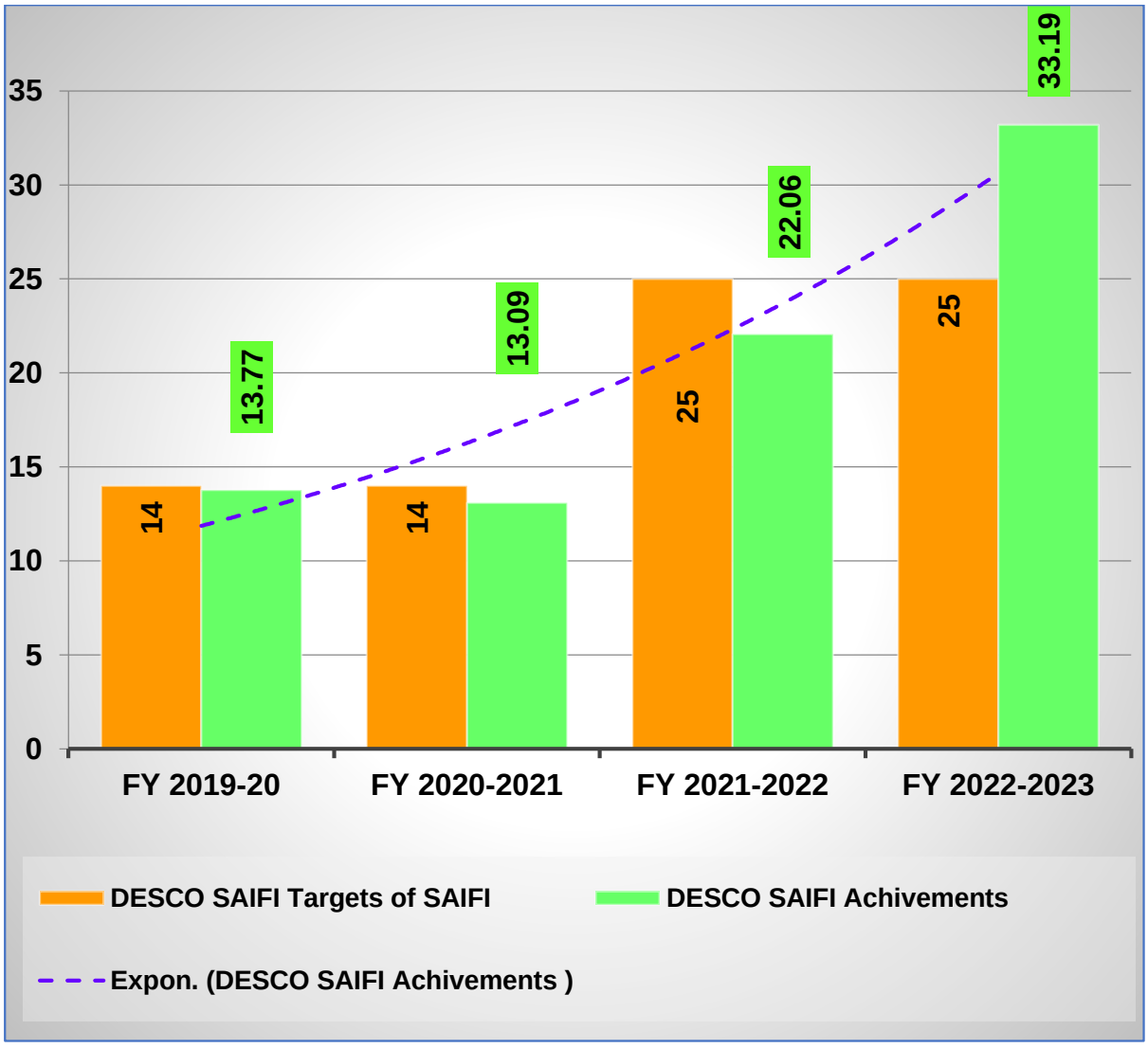
FIGURE-78: DESCO- TARGET-ACHIEVEMENT OF SAIDI WITH ACHIEVEMENT TREND LINE



DESCO: SAIFI

The **Figure-79** shows that the target and achievement of SAIFI of DPDC for the following fiscal years-FY2019-20, FY2020-21, FY2021-22 and FY2022-23 (Till March 2023). The target of SAIFI of DESCO was 14 interruptions per customer whereas the achievement of SAIFI was 13.77 interruptions per customer, which was slightly below then the set target. In the FY 2020-2021, the target of SAIFI was 14 interruptions per customer and the achievement was 13.09 interruptions per customer. In FY 2021-2022, the target of SAIFI was 25 interruptions per customer and the achievement 22.06 interruptions per customer. In the FY 2022-2023, the target was 25 interruptions per customer and the achievement was 33.19 interruptions per customer in 9 months from July 2022- April 2023, which exceeded the target limit. The trend of figure-78 shows an upward trend line. It indicates the decline performance of SAIFI. The details are shown in **Figure-79**:

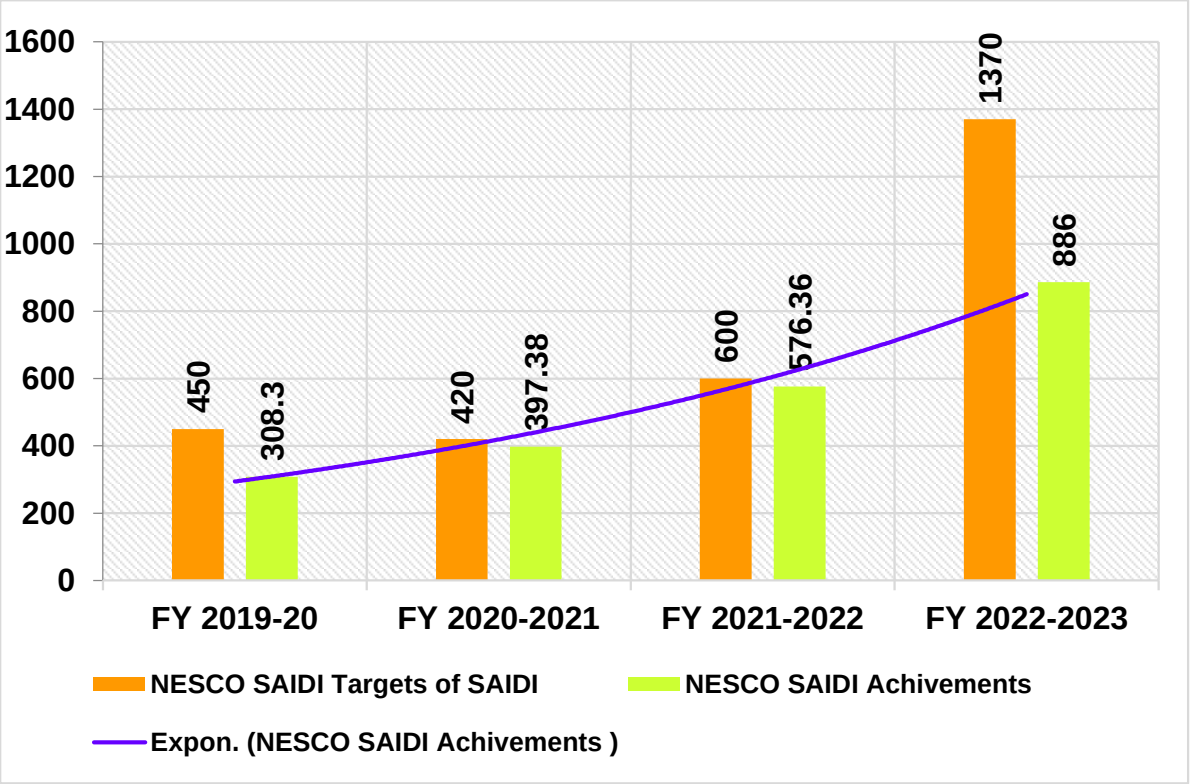
FIGURE-79: DESCO TARGET-ACHIEVEMENT OF SAIFI WITH ACHIEVEMENT TREND LINE



SAIDI: NESCO

The **Figure-80** unveil that the target and achievement of SAIDI of NESCO for the following fiscal years-FY2019-20, FY2020-21, FY2021-22 and FY2022-23 (Till March 2023). In FY 2019-20, the target for SAIDI was 450 minutes per customers, though the achievement was 308.3 minutes per customer, which indicates to better perform by NESCO. For the FY 2020-2021, the target was set at 420 minutes per customer and achievement was 397.38 minutes per customer. The performance of NESCO well improved. Subsequently, in FY 2021-2022, the target of SAIDI was increased to 600 minutes per customer and achievement was 576.36 minutes per customer, which is within the target limit. In FY 2022-2023, SAIDI achievement 886 minutes per customer, where the target was 1370 minutes per customer. It is also under the target limit and the trend figure line illustrated an upward trend. The SAIDI with target achievement Trend line figure provided in **Figure-80.**

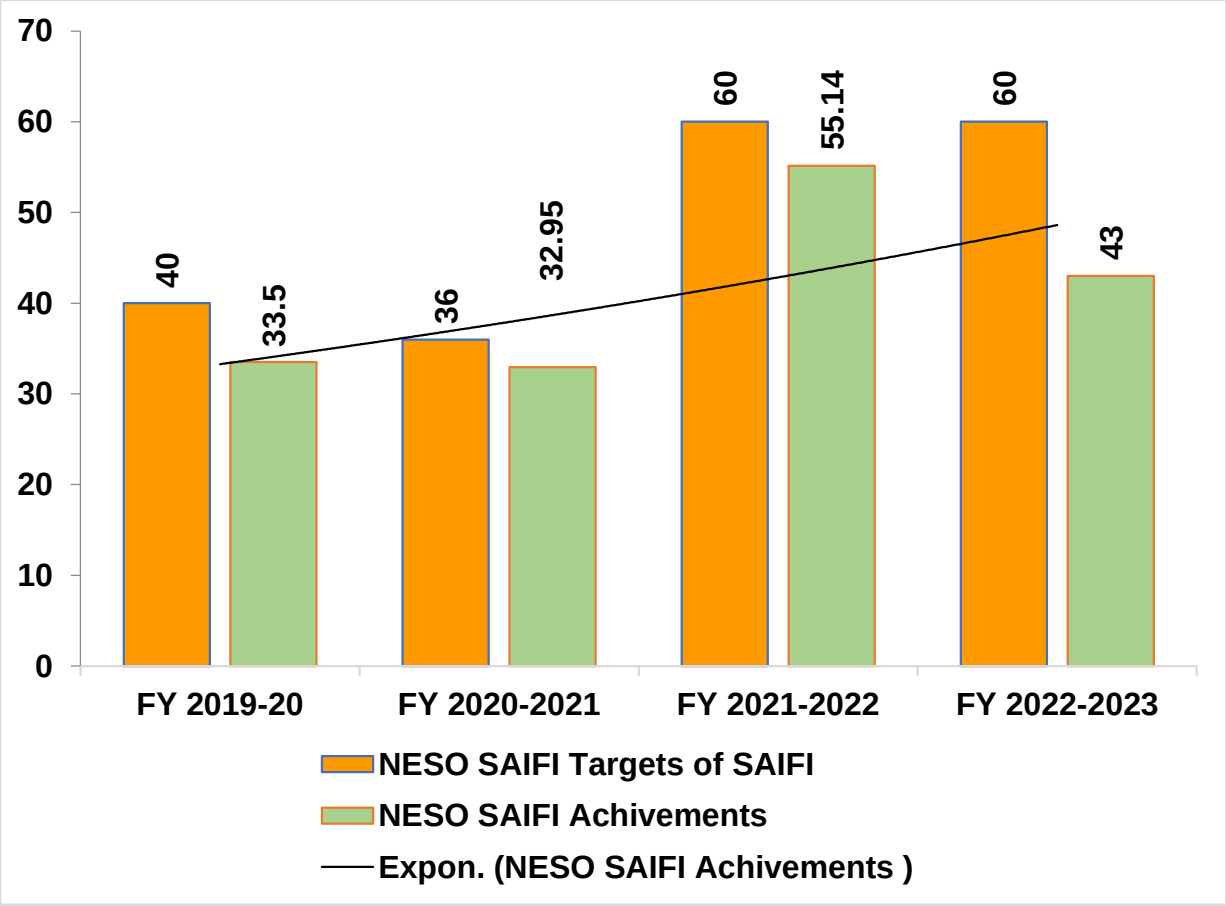
FIGURE-80: NESCO- TARGET-ACHIEVEMENT OF SAIDI WITH ACHIEVEMENT TREND LINE



SAIFI: NESCO

The **Figure-81** illustrates that the target and achievement of SAIFI of NESCO for the following fiscal years-FY2019-20, FY2020-21, FY2021-22 and FY2022-23 (Till March 2023). In FY 2019-20, the target of SAIFI was 40 interruptions per customer and achieved 33.5 interruptions per customer which indicates the improvement of power outages. In FY 2020-2021, The SAIFI target was set at 36 interruptions per customer and achieved 32.95 interruptions per customer. Therefore, it has seen an improvement in power outages. In FY 2021-2022, The SAIFI target increased to 60 interruptions per customer and achieved 55.14 interruption per customer. In FY 2022-2023, the target of SAIFI was at 60 interruptions of customer and the achievement was 43 interruptions per customer. Finally, the trend line figure has depicted a rising trend but within the target limit due to higher target value fixed up by the power cell. The Target-Achievement of SAIFI achievement Trend line figure shows in **figure-81**.

FIGURE-81: NESCO- TARGET-ACHIEVEMENT OF SAIFI WITH ACHIEVEMENT TREND LINE

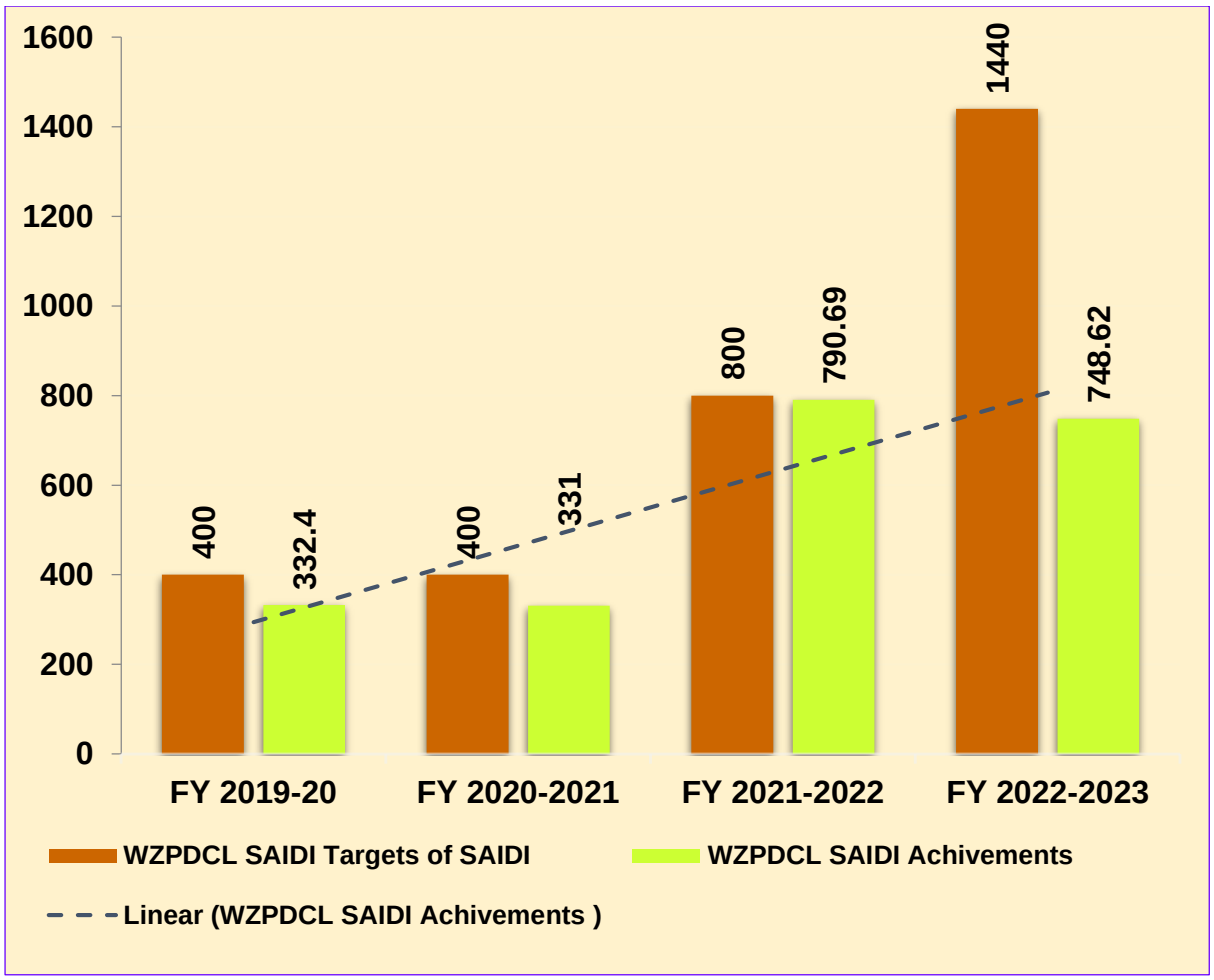


WZPDCL-SAIDI

The **Figure-82** unveils that the target and achievement of SAIDI of WZPDCL for the following fiscal years-FY2019-20, FY2020-21, FY2021-22 and FY2022-23 (Till March 2023). In FY 2019-20, the target of SAIDI was 400 minutes per customer and the achievement was 332.4 minutes per customer, which is actually shows the low power outages. In FY 2020-2021, the target was 400 minutes per customer achieving 331 minutes per customer. Moving to the next fiscal year, after an increase the target of SAIDI was 800 minutes of customer and the achievement was 790.69 minutes per customer, where the SAIDI values remains within the target limit. In FY 2022-2023, the target was set at 1440 minutes per customer and the achievement was 748.62 minutes per customer, which is also increased SAIDI values but within the target limit in nine months from July 2022 to march 2023.Overall. The values of SAIDI illustrated an upward trend which seems that per customer interruption 332.4 minutes per customer to 748.62 minutes per customer, which indicates digression of the performance of the WZPDCL due to higher SAIDI value but still it is within the target limit.

The SAIDI with target achievement Trend line graph provided in **Figure-82.**

FIGURE-82: WZPDCL- TARGET-ACHIEVEMENT OF SAIDI WITH ACHIEVEMENT TREND LINE

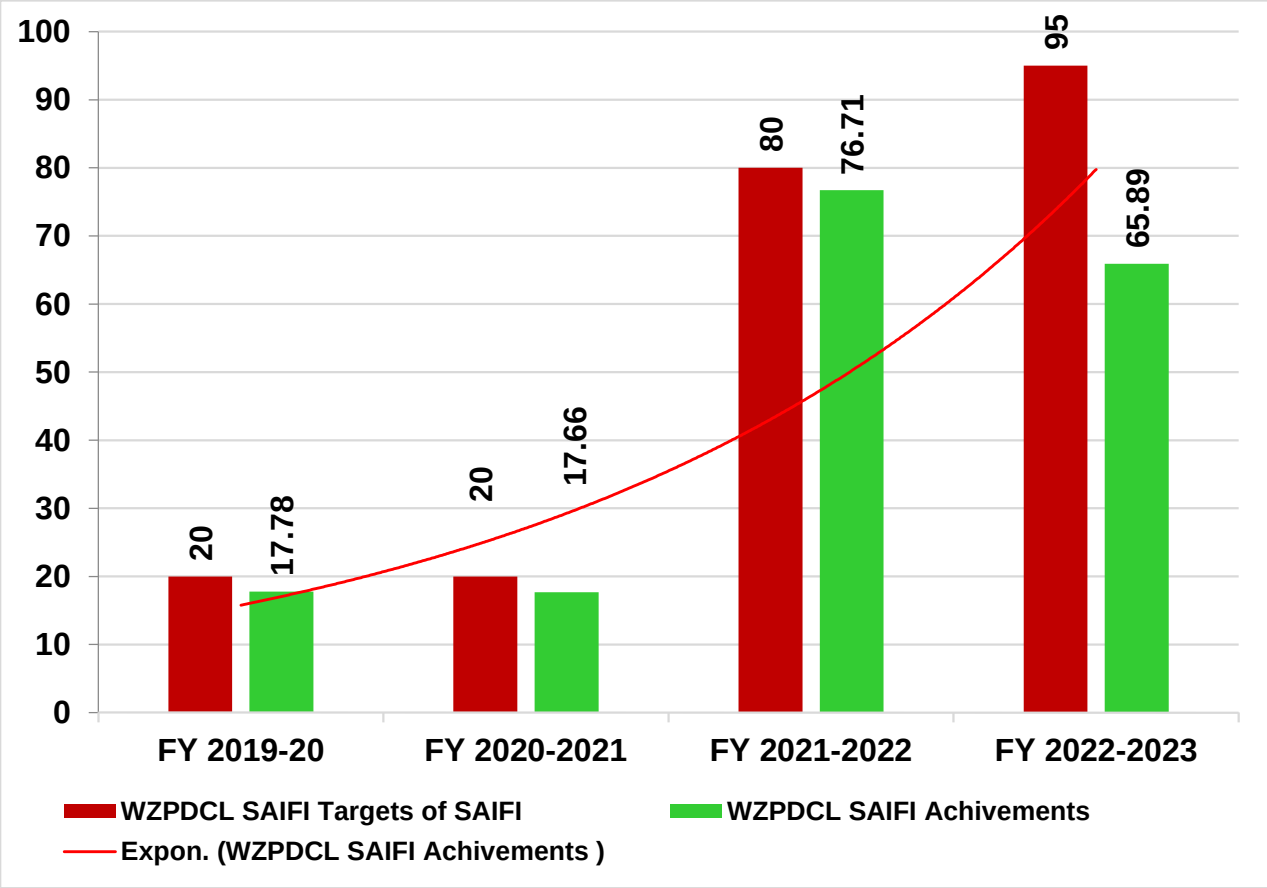


WZPDCL: SAIFI

The **Figure-83** shows that the target and achievement of SAIFI of WZPDCL for the following fiscal years-FY2019-20, FY2020-21, FY2021-22 and FY2022-23 (Till March 2023). In FY 2019-20, the achieved of SAIFI's value was 17.78 interruptions per customer, where the target was 20 interruptions per customer. The following next year of SAIFI's value was 17.66 interruption per customer and the target was 20 interruption per customer. In FY 2021-2022, the target was set at 80 interruption per customer and achievement was 76.71 interruption per customer. Moving on to the next fiscal year, the achieved SAIFI value is 65.89 interruption per customer from July'22 to March'23 and the target was set at 95 interruptions per customer. Overall, the trend was an upward and within the target limit set up by the power cell.

The Target-Achievement of SAIFI with achievement Trend line graph shows in **figure-83**.

FIGURE-83: WZPDCL- TARGET-ACHIEVEMENT OF SAIFI WITH ACHIEVEMENT TREND LINE



5.4 THE GIST OF SUGGESTIONS BASED ON THE ANALYSIS OF SAIFI, SAIDI AND CAIDI

The observation on the SAIDI and SAIFI of Six (06) utilities under the power division, it is found from the analysis that the interruption of FY 2019-2020 and FY 2020-2021 are gradually decline but in FY 2021-2022 and FY 2022-2023 the value of SAIDI and SAIFI are increased significantly, which indicates the performance of the utilities are digression because of higher interruption number and duration per customer. It is also mention that, in FY 2021-2022, FY 2022-2023, the SAIDI and SAIFI values are higher than the previous year, but their achievements were within the target limits.

SAIDI, SAIFI, and CAIDI are not only dependent on the distribution network system, it is also dependent on the entire power system including generation, transmission, and distribution. The limitations on the power generation and transmission can have an impact on SAIDI, SAIFI, and CAIDI values. The power outages occurred due to the fault/limitation in the power generation and transmission system, which can affect the large number of consumers. During the months of July 2022 to October 2022, SAIDI, SAIFI, and CAIDI values were higher due to the load shedding. In most cases, the load shedding occurred as a result of limitations in the power generation and transmission system. At present, six utilities using power interruption reporting format on their own, which is not similar to each other. Hence, we think that, the Power Cell could standardize the interruption reporting format for calculating the results of SAIDI and SAIFI in a unified way for better understanding.

5.4.1 Way to improve the reliability

- **Minimize the Load Shedding:** The Authority needs to take measures to reduce the limitations of power generation, transmission and distribution system by paying their full attention to select the quality equipment & machineries, skilled manpower, etc., This will reduce the overload of the substation and will also ensure the uninterrupted power supply.
- **Distribution Fault Management:** Actions need to be taken in this regards are as follows- (a) Regularly conduct tree trimming and vegetation management near the power distribution lines to minimize the interruptions, which is caused by the tree-related faults, (b) Set the bird guard over the pin insulator to reduce the power interruption, (c) Increase the number of circuit patrols to provide the service quickly, (d) Detection of the faulty information through automated systems and communicate the same to the patrol team to reduce the restoration time and (e) Use the vehicles with modern equipment and safety device.

- **Limiting the Number of Interruptions:** Implement updated and smart strategies to minimize the frequency and duration of interruptions experienced by customers. Use the proper size of DOFC[11] and MCCB[12] to each distribution Transformer to limiting the number of interruptions.
- **Efficient Maintenance Planning:** Optimize the maintenance schedules to minimize the impact on customers and limit the number of affected customers during maintenance activities. Use the reclosure isolator in each section.
    - Introduce loop circuits instead of radial feeders and implement a smart grid system.
- **Upgradation of Distribution System:** To minimize the distribution faults along with the reduction of the number of affected customers, proper Invest is required to upgrade the existing system.

The implementation of the aforesaid suggestions can help the utilities to enhance the reliability of power systems, side by side decrease the frequency and duration of the interruptions, which is ultimately enhance the customer's satisfaction level.

[11] Dropout Fuse Cut-out
[12] Moulded Case Circuit Breaker

SECTION 6: FEEDBACK FROM FGDs

6.1 Preamble

For digging out real facts of the customer satisfaction survey under BPDB[13], BREB[14], DESCO[15], DPDC[16], NESCO[17] and WZPDCL[18] enumeration areas, 6 (six) Focus Group Discussions (FGDs) were organized systematically to portrait the overall idea and relevant information on the progress of the customer care services, development of the socio-economic conditions, along with the impacts of the BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL daily activities on the people of their project areas. The successes and the future requirements of the areas were analysed in the light of the information, and inputs provided by officials of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL. All the FGD participants took part in the discussions, which were lively and educative and threw useful light on various matters spontaneously.

6.2 Status of the FGD Participants

The participants in FGD were persons holding leadership positions and pursuing diverse vocations and activities. The participants included:

BPDB**: Chattogram (Agrabad):** XEN (no. 2) C.E. (no. 1), A.E. (no. 3), S.A.E. (no, 3), S.D.E. (no. 2), S.E. (no. 1).

BREB Narayanganj & Mymensingh (Narayanganj): Additional Chief Engineer, Assistant General Manager (OM), Assistant General Manager (Elc.), Assistant General Manager (IT), Junior Engineer (ERU), Junior Engineer, Power Use Coordinator, Assistant General Manager, Executive Engineer, Senior General Manager, Assistant General Manager (Finance-Revenue), Assistant junior Engineer, Assistant General Manager (IT), Deputy General Manager (Tech.), Deputy General Manager (H/Q-Tech.), Assistant General Manager (MS), Assistant General Manager (F-R).

DESCO (Nikunja, Dhaka): Executive Director (Operation), Chief Engineer (No. 1), Superintending Engineer (no. 1), Executive Engineer (no. 3), Assistant Engineer (no, 1), Sub-Assistant Engineer (no. 1), Office Assistant (no. 1), Sr. Asst. Foreman (no. 1), Sub-Divisional Engineer (no. 3).

[13] Bangladesh Power Development Board
[14] Bangladesh Rural Electrification Board
[15] Dhaka Electric Supply Company Limited
[16] Dhaka Power Distribution Company
[17] Northern Electricity Supply Company PLC
[18] West Zone Power Distribution Company Ltd.

DPDC (Dhanmondi, Dhaka): Chief Engineer (no. 2), Superintending Engineer (no. 1), Sub-Divisional Engineer (no. 1), Sub-Assistant Engineer (no. 3), Sub-Assistant Engineer (no. 2)

NESCO (Rangpur): Chief Engineer (no. 1), Sub-Assistant Engineer (no. 5), XEN (no. 1), Executive Engineer (no. 3) and Assistant Engineer (no. 2).

WZPDCL (Khulna): ED (Operation), ED (P&D), Chief Engineer, Superintending Engineer, XEN (Satkhira), Assistant Engineer (S&D-3, no. 3) Sub Assistant Engineer (S & D-3, no, 6) Satkhira, XEN (Khulna).

All the participants are involved for a long time with the Electricity Distribution Company and gathered specialised knowledge and skills. All the FGD respondents had comprehensive in-depth knowledge and familiarity with the activities related to Electricity Distribution of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL.

6.3 FGD Venue and Time

The Focus Group Discussions (FGDs)[19] were held in the Conference Room of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL. The participants attended from the selected Organizations/ Companies. From March 2023 to April 2023, 84 participants attended the FGD programs (**Annexure-6**). In total, there were 6 FGDs.

6.4 High-points of Focus Group Discussions (FGD)

Topographically and ecologically, Bangladesh is not on the same plane. Some parts of the country are disaster prone and vulnerable to climate changes, and some are not. The authorities of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL planned, designed and implemented various customer care services through uninterrupted Electricity Distribution, with main objective of reducing dissatisfaction from the inner mind of their valuable customers. The information generated by six FGDs is submitted in the following sections:

6.4.1 Knowledge of Customer Care Services of Electricity Distribution Organizations/ Companies

All the participants in focus group discussions mentioned that they have comprehensive in-depth professional knowledge and familiarity with the implemented activities of their Organization/ Company. They also stated that they are fully aware of the type, quality, and usefulness of the services that have been rendered for their customers. This is the proof of their customer handling competence to uphold the satisfaction level of the customers.

[19] FGDs were conducted by MIDAS Technical Experts

1. Opinion on time taken by the electricity distribution Organization/ Company for providing electricity connection:

Against the aforesaid question, the majority of the FGD participants of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL mentioned that their customers (Residential / Commercial / Charitable / Industrial + LP / Irrigation) are receiving electricity connection within 7 (seven) days from the date of application if they fulfil all the needed criteria set for the connection procedure.

On the other hand, maximum number of FGD participants of DPDC and DESCO opined that they are providing electricity connection to the industrial customers within 18 (Eighteen) days from the date of application, if the applicant documents are legally matched with the requirement of DPDC and DESCO. DPDC participants further stated that they are issuing the demand note within 2 days for LT connection against the error free application and after receiving the full payment against the demand note, the required connection is provided within 2 days from the date of deposit. They are also informed house that DPDC ensures LTI[20] connection within 2 days and the HTI[21] connection within 8 (eight) days to their customers from the date of application for the error free submitted documents.

BREB, WZPDCL and NESCO mentioned that their connection is provided within 7 (seven) days for LTI connection and 18 (Eighteen) days for HTI connection from the date application, if the submitted documents are acceptable with their requirement. It is noticed from the participants of WZPDCL that they are providing an HT connection to the customers against the legally valid application within 15 (fifteen) days from the date of application.

While the BPDB provides new electricity connection to their customers for Single Phase line within 7 (seven) days and for Three Phase line within 18 (Eighteen) days, if the submitted documents of the customer are meeting the demand of the set criteria of BPDB. BPDB participants further informed the house that they provided Temporary Connection for Single Phase line within 3 (three) days and for Three Phase line within 7 (seven) days, if the customer's application fulfils the set criteria of BPDB.

It is coming from the analysis that all the utilities are strictly maintaining the time for providing electricity connection following the set policy.

[20] Low Tension Industry
[21] High Tension Industry or 11KV

2. Opinion regarding problem faced in providing new connection against application form:

Against the aforementioned question, the maximum number of FGD participants from BPDB, DPDC, and DESCO informed the house that most of the applicants of Government agency and autonomous bodies are critically reluctant to provide the TIN and NID certificate with their application for getting a new electricity connection, which is not meeting the demand of the set criteria and delay in providing new econnections against the application form.

FGD Participants from BREB, NESCO, and WZPDCL mentioned that occasionally the adjacent neighbours are creating unwanted problems when their professionals started to setting electricity connection against the new application and delay the process. The participants of BPDB said that they faced some problems during setting new connection due to duplication of land ownership, categories of land such as Government Khas land, ponds, and disputed lands.

The participants of BPDB, and WZPDCL said that they are facing problem in providing new connections against application form due to the following reasons- applicants are not depositing money against the demand note on time, incomplete structures, structure is not built at the applied place, local embargoes, and the objection of local people. At the same time, the DESCO participants stated the causes as follows - delay in making payment against the demand note, delay in installation of solar system at the applied place, and improper authorization letter of representative in the absence of customer at applied place.

Most of the buildings are not constructed according to Rajuk’s approved plan. In that case, it becomes very difficult to provide electricity connection according to the demand of the esteemed consumers by following the policy added by DPDC. Sometimes customers, made mistakes in providing required documents further added by the participants from BPDB, and DPDC.

DPDC participants also raise the following as a prime cause in providing new connections against application form - the dilapidated congested area of old Dhaka, the required space for setting up a new transformer is not available at the applied place, even at the Government places do not have the enough space to install a transformer, and non-cooperation of the esteemed customers is also a noticeable problem.

DESCO participants stated the following as an added problem in providing a new connection against the application form- a) Multiple applications received from the same house and place, and b) There is no proper clearance of the concerned authorities for the applied place/house.

The participants of WZPDCL put forth the following as the problems – a) Fake NID, b) Complexity to verification of submitted Land Deed, c) Complexity in Customer’s Ownership, d) Due to incompetency in document verification is very difficult to verify the attached land documents. Proper training is needed for the concern officials of WZPDCL.

The analysis says that the six utilities have the knowledge and experience of the problem faced in providing new connections against application form. The six utilities may take action to arrange awareness campaign on a quarterly basis to reduce the ignorance of the customers regarding the requirement to get a new connection.

3. Opinion regarding the factors considered by the electricity distribution Organization/ company authority in providing new electricity connection to the customer:

Against the above-mentioned question, the maximum number of FGD participants of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL raised the following as the prime factors considered by them for providing new electricity connection against the application form, which are unanimously accepted by all of their customers- a) Attested copy of applicant's Land Ownership Deed/Khatian/Rental Deed, b) 02 (two) copies of applicant's photograph and copy of NID, TIN Certificate, updated trade license, applied tariff, customer’s mobile number, distance from electric pole, applied demanded load and place, c) Load capacity of related distribution transformer, capacity of related feeder, length of service cable, acceptable load of installation as per policy, ownership documents, nature of use of building, multi-storied, fire certificate of building etc. In addition to these, the following factors are considered by BPDB, BREB, and DPDC - type of electricity to be used, the determination of the load of the solar system to be installed, meter arrangement and meter sequence are rearranged according to the load.

Besides, BREB and DPDC required the following certificates during issuing the electricity connection- a) Installation test certificate issued by valid Electricity License holder.

New connections are provided considering the power consumption pattern of the customers and according to their applied load added by the participant of DPDC. They also consider whether the applicants are any unpaid electricity bill against any previous connection with the applied establishment (If applicable) mentioned by the respondents of DPDC.

Most of the participants of BPDB said that they are needed the justification of Demanded Load from the applicants with their application for electricity connection.

The majority of the BREB participants further added that if the applicant has any previous connection, a copy of the last paid bill of the said connection needed to be attached to the applicant’s application form for new electricity connection along Letter of Permission of Building Construction.

NESCO participants further stated that they are considering the following factors during connection of new electricity line against the new applicant- a) Capacity of Grid, b) Capacity of Substation, c) Feeder Capacity, d) Installation of Solar system, and e) Environment Clearance.

The analysis says that the six utilities are critically considered all the factors by them in providing new electricity connection to the customer. It is better to organize an awareness campaign on quarterly basis for the customers.

4. Opinion regarding factors that denote the Customer’s satisfaction with the services desired by the customer from the electricity distribution Organization/ Company, such as - minimum load shedding, getting electricity quickly, getting electricity bill on time and paying electricity bill easily:

Against the afore stated question, the maximum number of FGD participants from BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL indicated that – a) Customers are getting electricity bills on time and paying bills without penalty with the help of the bank and Online using Nagad, Bkash and rocket, b) Post-paid customers are also able to pay bills easily through online bill-pay system, c) All the customers are highly satisfied due to timely receipt of electricity bills and they are also able to make their electricity bill payment easily electronically. They are further added that currently feeder-based load shedding schedule is designed to keep the optimum level of customer satisfaction. They disclose that currently the demand of pre-paid meter is enhanced because of the payment procedure is easily done through electronic payment systems. Prepaid customers are recharging their balance with their own way and time. They also said that there is no problem in getting the electricity bill from the customers. They are strictly taking care of load shedding to keep full satisfaction of their customers which ultimately leads to develop win-win-relationship with their customers.

It is revealed from the discussion of the BPDB, BREB, DESCO, and DPDC participants that they are informing their customers through public announcement before start the load-shedding.

The participants of DESCO informed that they are delivering the electricity bill on time to the customers via email. Besides, customers can easily print the bill from DESCO website, and there is an option to pay the electricity bill through DESCO Mobile apps. They further informed that electricity bills can be paid by the designated banks. Besides that, the customers can pay their bill through existing

bank booths at DESCO office. Other options to pay electricity bill by using Bkash, Rocket, Debit Card, and Credit Card. Load shedding is now being ensured through well-planned SCADA[22] systems they added.

The participants of WZPDCL disclosed in the house that fastest electricity connection increases the satisfaction level of their new customers.

The respondents of DESCO and WZPDCL informed that, they are strictly following the zero-tolerance policy against corruption which makes the DESCO and WZPDCL a fully transparent Company.

The total required services are rendering through One-Stop-Point and Focal-Point-Desk to their customers added by DPDC participants. DPDC always does the maintenance work on a regular basis of their substation power transformer sets and check the distribution transformers at regular intervals. DPDC participants further added that they are always honest to ensure uninterrupted power supply is at stable voltage and power supply has been greatly simplified. They always try to ensure to provide quality electricity according to the need of their customers.

Prior to start load shedding/shutdown, DPDC and NESCO participants informed their customers through bulk SMS/ miking/ phone.

BPDB informed their customers in case of power outage that it will be resolved as early as possible. They always motivate their customers regarding this situation.

At present the customers are very satisfied with the service of Bangladesh Rural Electrification Board, but there are some dissatisfactions because of frequent line maintenance work added by the participants of BREB.

The majority of the WZPDCL participants informed the house that, their customers can pay their electricity bill through Bank and online. They further added that their prime weakness is, they do not have underground cable and a smart grid. The main cause of dissatisfaction is Interrupted electricity supply.

Load-shedding is at zero level in winter season, but due to fuel shortage, at present customers are facing load-shedding and they are awfully dissatisfied with the service of NESCO added by the NESCO participants. But, NESCO is gradually improving their existing situation by introducing- a) smart payment meter, b) new transformers, c) new distribution lines etc., have brought improvements in the service quality. They further added that, customers can lodge their complaint by using Hotline number. The received complaints are resolved as soon as possible.

[22] Supervisory Control and Data Acquisition

The analysis says that the six utilities are maintaining a good official practice to satisfy their customers. They should strictly maintain the same practice ahead.

5. Opinion regarding power supply quality (ie: correct voltage, voltage fluctuation, power interruption and power factor) in existing system:

Against the aforesaid question, the maximum number of FGD participants from BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL informed the house that, voltage fluctuation is not occurred in their distribution system. They further added that the value of power factors of their Organization/ Company is at standard level. They are strictly maintaining the amount of interruption at minimal level and recorded the same on yearly basis.

The participants of BPDB, DESCO and DPDC informed that the voltage is stable at the customer end, there is no voltage surges, power interruption, power factors are correct and the power supply in the system is satisfactory.

Maintenance is done every year in winter so that the voltage level is at satisfactory level added by the participants of BPDB, NESCO, WZPDCL.

Voltage level is monitored within prescribed limits through SCADA mentioned by the participants of DESCO.

The grid voltage in the region occasionally drops due to the enhancement of summer loads added by the participants of NESCO. Actually, voltage fluctuations are occurring due to under frequency further added by the participants of NESCO.

The value of power factor is above 0.92 at grid level and above 0.95 at customer level added by the participants of DPDC. If the value of power factor is below 0.95, in that case it remains for 3 months then proper action is taken to make it acceptable to the customers further added by the participants of DPDC.

At present, the quality of power supply in BPDB system is satisfactory. Correct voltage, voltage fluctuation and power interruption are currently brought to a minimum by carrying out emergency repairs and maintenance. Providing correct voltage by installing PFL[23] Plant at substations of medium voltage and high voltage consumers added by the participants of BPDB.

11 kV and 33 kV underground lines provide uninterrupted power service at the correct voltage. The service area of other PBS is very large and there is a delay in quick resolution of complaints added by participants of BREB.

[23] Plant Load Factor

Installation of the PFI plant at the customer end is encouraged to maintain a power factor as it is expected mention by the participants of DESCO.

The voltage regulator is used to supply the correct voltage at the consumer level. Adequate capacity banks are used in distribution lines and substations to maintain power factor values above 0.90 added by the participants of BREB.

Based on the findings, six utilities may prepare an action plan to improve the power supply quality considering the future power demand of the Customers.

6. Opinions about the recording of customer complaints by electricity distribution Organization /Companies and redressal in short time (with complaint box). Problems faced in terms of quick solutions:

Against the aforementioned question, the maximum number of FGD participants from BPDB, BREB, DPDC, DESCO, NESCO, and WZPDCL informed the house that, the customer service desk is opened and customers can submit their any complaint at any time. They further disclosed that all the available services are provided to the customers quickly after receiving their complaints.

A team has been constituted in this regard by officers/employees for maintaining customer satisfaction inform by the participants of BREB. To provide a quick solution to the customers against their complaints, we are always late at Madanpur area due to huge traffic jam added by the participants of BREB. To provide the proper solution against the lodged complaints is not a big problem, but it is different to resolve the issue during the natural calamities. Heavy rainfall is also not a problem in this situation further mention by the participants of BREB.

The technical team of Power Office Control Room resolves the customer complaints at the earliest and keeping records of the provided service added by BREB participants.

The majority of the participants of BREB suggested that- a) manpower of the complaint centre should be increased, b) number of complaint centres should be increased for quick re-solution, c) the model complaint centre should be converted into a service centre to solve all kinds of problems, d) record the customer complaint in the register properly, e) A technical team needs to be formed for quick re-solution of customer complaints. These actions will bring quick solutions against the lodged customers complaints which ultimately create a great satisfaction at the customer’s level.

They further suggested that, technology dependent technical training needs to be provided to the BREB professionals and line workers. This type of training will enhance the capacity of the BREB professionals to handle the customer’s

complaints quickly with the proper solution. All the received customer’s complaints are recorded and forwarded the same to the operations team for proper solution as soon as possible. After completing the inspection, the technical team reports to the responsible “officer” added by the FGD participants of BREB.

Many times, problems cannot be solved quickly due to less manpower mentioned by the BREB participants. Customer complaints are recorded 24/7 and resolve the issues quickly with the help of technicians. Keeping multiple redressals of grievance, BREB teams always ready to provide support in case of emergency situation added by the participants of BREB.

As usual, they are rendering service to the customers against their complaints sometimes delayed due to the following reasons- a) heavy traffic on the roads, b) shortage of manpower and vehicles, and c) large service length mentioned by the participants of BREB, BPDB, and DESCO.

The majority of the participants of DESCO informed that, 24/7 3-shift manpower is needed to make the DESCO service team more dynamic. They further added that, 52.5% of complaints are resolved within 0-30 minutes, 30% within 31-60 minutes, 7.5% within 61-90 minutes and 10% within 90 minutes. They also informed the house that usually, the cause of failure is to provide the correct information due to traffic jams, and narrow roads delay in settlement of complaints. Providing quick connection against the customer’s application is a big strength of DESCO added by the participants. Complaints are being resolved and monitored through DMS (Dispatch Management Systems) in WEB based Complaint Management Systems (CMS). The service quality has been improved by live tracking the location of the people engaged in redressal of grievances added by the participants of DESCO.

The majority of the participants of NESCO mention that due to the shortage of the following items and equipment they are facing tremendous problems- a) not having smart meters, b) lack of fault detector in the distribution line, and c) shortage of vehicles. Availability of these items and equipment will bring improvement in NESCO customer service unit.

Complaints that are not amenable to settlement are notified by official letter to the Customers mention by the participants of BPDB and DPDC.

Crowded traffic jams on the narrow roads under the Lalbagh office, Dhaka is the main impediment to provide the services needed by the customers at their place added by the participants of DPDC.

If the real address and mobile number is provided by the complainant when they did complain about their problems, the complaint will be resolved quickly by identifying the location line added by the participants of BPDB and BREB.

The majority of the participants disclose that, to improve the existing customers service WZPDCL, considering the distance of the line in rural areas and to cover the geographical area of WZPDCL, proper vehicles and skilled manpower is needed. They also urged to arrange proper technical and customers service training for the concerned manpower of WZPDCL. These actions will facilitate the customers to get a quick response with proper solution against their lodged complaints.

It is only at the time of natural calamities (Storm/Rain), the redressal of grievance takes a little more time than expected time. The customers are happy with this beneficial service added by the participants of BREB and WZPDCL.

Pre-paid meters are experiencing unbearable technical malfunctions mentioned by the participants of BPDB. BPDB has 24/7 hotline number 16200 including IVR[24] (Incoming Voice Recorder). The voice of customer is automatically recorded in the IVR for further investigations and proper solution.

The majority of the BREB participants mentioned that the customer service can be improved furthermore, if the customers mentioned their address and mobile number correctly during lodge their complaint. BREB team always recorded the customer’s lodge complaints in the register, thereafter, it is informed over telephone or direct contact. Afterward, the recorded complaint will be handed-over to the Complaint Team for resolving the issue. If the number of lodged complaints is more at the same time, it takes more time to resolve the issue at a time as the BREB has not enough complaint resolving team mentioned by the participants of BREB.

Based on the unveil problems and service-related constraints, six utilities may take immediate action to resolve the issue to uphold the customer’s satisfaction level.

[24] Incoming Voice Recorder

7. Opinion regarding the biggest strength and biggest weakness of the electricity distribution Organization /Company in providing electricity customer service:

Against the aforementioned question, the majority of the participants of **BPDB** stated that, the **major weakness** in delivering required electricity services as expected by the customers due to unbearable technical malfunctions of prepaid meters along with it is not being online. They further added that the **greatest strength** of BPDB team is as follows- a) service delivery capabilities, b) job knowledge and skills, c) service mind-set, d) sense of responsibility, e) sincerity, f) honesty, g) hardworking attitude in service and h) wholehearted commitment to work. BPDB team can provide quick service as they have upper hand professionals and technical skill during power outages. BPDB participants disclose to the house that the major strength of BPDB is technically skilled manpower for delivering the required electricity services as expected by the customers and online bill collection are the biggest strength of BPDB.

The majority of the participants stated that, detection of complainant's location is a major weakness of the **DPDC** customer service team. They further added that the **major Strength** of DPDC is a new online connection as they are now able to inform the customers about the power interruption schedule which has expedited the customer's satisfaction process. For bringing more customer's satisfaction need to establish new substation, but DPDC is unable to do that because of unable required space. The prepaid meters that were set by DPDC is not smart as expected by the customers considering its a service giving capacity which is a **great weakness** of DPDC. The participants mention that, the **greatest Strength** of DPDC is a digital system. They further added that with this online digital system DPDC customers can view and pay their post-paid bills from anywhere.

The biggest weakness is the shortage of skilled and trained technical manpower as well a lack of modern technology compared to the electricity lines along with lack of required transport mention by the majority of the **BREB** participants. They further stated the following as the demotivating factors, weakness and strength as follows- **Demotivating factor**: a) non-payment of risk allowance; **Weakness:** b) lack of manpower and vehicles, c) the biggest weakness is shortage of manpower and old vehicles (requires frequent repairs), d) unable to provide proper services against the lodged complaint of the customers during the hostile weather, and e) lack of adequate space for quality electricity lines; **Strength:** f) as a power distribution Organization/ Company, palli vidyut's employees are very sincere and hardworking, g) multiple sources and grids to provide uninterrupted power, h) greatest strength in providing customer service is a positive attitude and sense of responsibility of the member of customer service team, and i) enthusiasm, professional's efficiency of the technical team along with strong technical knowledge.

The majority of the participants of **NESCO** enunciated the demotivation factors, strength and weakness are as follows- **Demotivation factor:** a) NESCO not yet recognised as a government institution, b) inequality of rank and status at the field level, and c) power distribution organizations/ companies are not under the same umbrella, **Weakness:** d) inadequacy of opportunities for advanced training at home and abroad on technical-know-how for improving the professional knowledge and skill, **Strength**: f) up-to-date work planning, g) having the proper application of modern information technology, h) strict control and supervision of outsourcing manpower, and i) dedicated honest and skilled manpower.

The majority of the participants of **WZPDCL** proudly informed that, WZPDCL has 100% electricity line in the areas situated under its jurisdiction, which is a great strength of WZPDCL. The participants further added the strength and weakness are as follows - **Weakness:** a) lack of opportunities to receive adequate training on technical and customers service, b) unable to provide customers service against to lodge complaint on time, because of coastal area's adverse weather conditions, c) unable to provide proper customers service against the lodged complaint because of large number of complaints, d) using of sub-standard materials in Electricity System, f) WZPDCL supply grid is overloaded, g) lack of number of grid and capacity of grid, and h) the biggest weakness is WZPDCL is unable to increase the number and capacity of the existing grid. **Strength:** i) the biggest strength WZPDCL is Digitalization of the Services (Smart Pre-paid metre, SCADA, SAS etc.), j) Solve the lodged complaints within a shortest time, k) Technically well qualified skilled manpower, and l) Provide electricity connection within a shortage possible time.

The majority of the participants of the **DESCO** depicted the strength and weakness are as follows- **Strength-** a) Updated work plan, b) proper application of modern information technology, c) professional's positive mind-set, and d) control and supervision over outsourcing manpower strictly. **Weakness:** a) Lack of technical knowledge and skill among the professionals, b) Lack of opportunities to attend training on updated technology and customers service, c) Lack of opportunities to arrange awareness training for the **DESCO** customers to improve their outlook about DESCO customer's services, d) Lack of modern equipment to carry out the electricity line maintenance work, and e) Lack of proper internal coordination system.

The analysis unfolds the basket of weakness and strength of six utilities in details. The authority of six utilities may prepare an action plan to transform the weakness to strength.

8. Opinion regarding steps taken as an electricity distribution Organization/Company to prevent electricity accidents and ensure safe electricity supply:

Against the aforesaid question, the majority of the participants of BPDB, BREB, DPDC, DESCO, NESCO, and WZPDCL informed that for building awareness among the customers by distributing leaflets regarding medical safety during use of electricity in their home.

The participants of WZPDCL and NESCO disclosed that, for developing in-depth awareness among their customers, they are arranging a yard meeting on a regular basis with their honourable customers and discuss about the safety process during use of electricity appliances in their home to avoid any type of unwanted accident.

We are providing letter to the customers stating the maintenance procedure and guidelines who have substations added by the participants of DPDC. In case of new connection, we are inviting Government ABC licensed providing authority to examine the total house wiring to certify its safety further added by the participants of DPDC. We encouraged the residential customers to use accurate quality electricity drawing, purchase quality Electricity equipment, install MCBs, and store the substation under medium pressure environment. We also encouraged to procure approved conductors, equipment and appropriate fuses for setting the electricity wiring at the home through ABC licence holding electrician added by the participants of DPDC.

The majority of the participants of BREB inform the house that, repairs and maintenance of lines and substations are carried out as per schedule. If needed, repair work is carried out under the overall supervision of feeder-based officer in charge. They further added that, all type of safety measures (such as properly shut-down the electricity line, ensuring safety belt, safety helmet, safety shoes etc.) are taken to prevent any kind of electricity accident. We are also ensuring proper wiring certificate while making connections and proper earthing added by the participants of BREB.

We are conducting safety meetings with the customers on a regular basis and arranging technical training for our personnel to update their knowledge and skill added by the participants of WZPDCL.

To prevent unwanted electricity accidents, we regularly hold meetings with the customers, announcement through miking, distribute the information leaflets to uphold the customer’s awareness. Besides, the regular safety meetings and drills, we are doing electricity line maintenance work on regular basis added by the participants of NESCO.

During the customer gatherings and brainstorming sessions, Chief Engineers, Superintending Engineers and other dignitaries provide educative guidance and advice on the best use of electricity appliances and other electronics equipment to avoid any type accident inside the home/office/shop/factory informed by the participants of BPDB. They further disclose that, they are ensuring the use of safety equipment (helmet, gloves and others) while doing repair and maintenance work on distribution lines. The participants said that, BPDB is conducting regular on-job training regarding safety. Engaging adequate skilled manpower to solve the arising problem added by the participants of BPDB. They further inform that for increasing public awareness they are conducting regular fire drills.

DESCO professionals always engaged themselves for Identifying and de-risking the hazardous electricity lines added by the participants of DESCO. They further added that for proper Shutdown of existing electricity lines, the customers should fill-in the shutdown form properly thereafter the DESCO professional’s shutdown the electricity line against the shutdown fill form. If there is a shutdown, the word shutdown is written on the feeder as well as the word should be written on the pole added by the participants of DESCO. 33/11 KV Substations staff are given firefighting drill with the help of fire brigade informed by the participants of DESCO.

Based on the FGD findings six utilities can play an excellent role by arranging awareness campaign for their customers regarding the prevention of accidents due to electricity short-circuit and try to ensuring the supply of safe electricity. This action will improve the safety for the electricity users of six utilities.

9. Opinions about the current situation of customer service provided by the electricity distribution Organization/company:

Against the aforesaid question, the maximum number of participants of BPDB, BREB, DPDC, DESCO, NESCO and WZPDCL informed the house that, the quality of customer service has improved more than ever before by delivering quality electricity to the customer. By these activities, at present, customer service is more acceptable and satisfactory to the customers. They further informed that; dissatisfaction is enhancing gradually due to continuous change of tariff.

The majority of the participants of DESCO and NESCO urged that, line fault detectors and advanced devices should be used to reduce the duration of interruptions.

Customers get all services according to their needs through online at home added by the participants of DPDC.

The current situation is much better than before, but more quality improvement is possible by increasing the availability and employing more skilled manpower

informed by the participants of DESCO. Due to speedy re-solution of complaints by customers and installation of prepaid meters, customers are now comparatively satisfied ever than before added by the majority of the participants of DESCO.

Currently, the quality of customer service is far better than before. As electricity utmost essential for a better and comfortable life. But there is a room to improve the customer service furthermore as the present lifestyle is fully technology dependent added by the majority of the participants of NESCO.

The majority of the participants of BPDB and DPDC urged that to improve the existing customers service, the following initiatives need to be taken- a) More Call Centre/ Complaint Centre should be launched (it is noted that BPDB has been launched their call centre 24/7 in December 2022), b) Set up fault detectors, and c) introduces of smart grids.

The majority of the participants of BREB informed that, uninterrupted Power supply has increased i.e., SAIDI/SAIFI trend is decreasing.

A complaint is resolved within the shortest period of time happily informed by the participants of WZPDCL.

It is coming out from the analysis that for improving the current situation of the customer services, the authority of six utilities may consider the need that has been identified by the FGD participants.

10. Opinion regarding steps should be taken to improve the relationship between electricity distribution Organization/Companies and Customers:

Against the aforementioned question, the maximum number of the participants of DPDC depicted that, mobile apps needed to be developed to improve the existing customer services. They further added that, catchy advertisement regarding available customer services of DPDC needed to be displayed through TV channels and social media. DPDC may encourage their customers to engage themselves with e-culture.

The majority of the participants of BPDB, BREB, DPDC, DESCO, NESCO and WZPDCL urged to listen the problems of their customers through public hearing and taking effective action accordingly.

Electricity bill needed to be taken by setting the smart energy meter added by the majority of the participants of DPDC and BREB.

The majority of the participants of DESCO, NESCO and WZPDCL suggested to reduce the number of legal documents required for the new connections at the

place of new customers. They think that, this will be improved the customer’s satisfaction.

The majority of the participants of DESCO suggested that, the problem of the customers needed to resolve at the field level by arranging public hearing. Customer relations can be further improved by developing transmission and distribution lines with adequate generation and hiring skilled manpower further added by the majority of the participants of DESCO. They also urged to establish GIS and SCADA based automation systems. The majority of the participants stated that, there is a visible need for advanced training for the DESCO professionals at an authorized training institute in home/abroad to face the upcoming 4th industrial revolution.

At present, the Best Customer Award is given to the outstanding BPDB customer on a yearly basis under each distribution zone. Besides aforesaid award, the social recognition award can be introduced to the best customer who does not have any outstanding electricity bills, which was suggested by the majority of BPDB participants. They further added that, BPDB need to implement the modern updated distribution system for better customer services to improve the satisfaction level of their customer. Regular campaigning and exchange of views on various contemporary issues can be shared in a meeting with the customers of BPDB once or two in a year added by the majority of the BPDB participants.

33/11/3,4 KV lines need to be underground urgently to ensure uninterrupted power supply added by the participants of BREB. They further mentioned that, the customers of BREB need to be Informed about the new services of BREB. Considering the frequent request BREB should resolve the customer’s complaint immediately after receiving the same added by the participants of BREB. They further informed that, immediately the following actions needed to be done by the BREB- a) to increase the power generation, b) to enhance the capacity of supply grid and transmission, c) to increase capacity of the substation, d) to improve the electricity connectivity and associated services, e) to arrange CSRs meeting should be performed once in a year and f) to inform about the smart grid systems of BREB.

Greetings to the honourable customers through SMS can be done on National festivals and Bangla Parbans a regular basis to establish DPDC and DESCO as a well-wisher of customers added by the participants.

The participants of WZPDCL suggested that considering the need of the customers and the modernization of the global technology WZPDCL needed to be introduced automation system at their distribution system. They further added that WZPDCL, needed to be established 100% Smart meters for electricity billing and up-grade the electricity fault detector in the distribution line.

More public hearings should be done with the customer so that the advantages and disadvantages of the customer will be known mention by the majority of the participants of DESCO and NESCO. Hearing meeting may be arranged with the head of schools and colleges, yard meetings with domestic customers, public hearings with of industrial and commercial customers, meetings with shopkeepers' association leaders, redressal of grievance meetings on a regular basis to improve the customer satisfactions level added by the majority of the participants of DESCO and NESCO.

Skilled and technically trained manpower and other updated logistical support should be ensured in power distribution Organizations/ Companies to provide uninterrupted power supply to customer added by the participants of BREB, NESCO and WZPDCL.

The majority of the NESCO participants said that, an One-Stop Service facilities can play a vital role in mollifying the dissatisfaction of the esteemed customers of NESCO.

Based on the FGD findings the authority of six utilities may prepare an action plan to improve the existing situation furthermore.

11. Suggestions to improve the quality of customer service by the electricity distribution Organization/Companies:

Summary of the suggestions of the participants of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL are furnished below. They think that the proper implementation of their suggestions will play a pivotal role in mollifying the dissatisfaction of the customers and expedite the professionalism of the personnel of the distribution Organization/Companies.

Suggested by the participants of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL:

- ☑ Arrange necessary training for the professionals of distribution Organizations/ Companies for online verification of the submitted documents of the new customer thoroughly.

Suggested by the participants of BREB, NESCO and WZPDCL:

- ☑ Increase the number of transports for faster communication with customers.
- ☑ Increase the number of call center for receiving complaints faster than the existing.
- ☑ Strictly maintain the maintenance and repairing schedule for better management.

Suggested by the participants of BPDB and BREB:

- ☑ Install the pre-paid smart meters for the hassle-free billing system.
- ☑ Recruit the skilled and technically trained manpower for better service.
- ☑ Introduce the technology-based services against the customer complaints.

Suggested by the participants of DPDC and DESCO:

- ☑ Maintain a better coordination with the RAJUK, and City Corporation for prompt and coordinating service.
- ☑ Promote all the available services through the website, smart mobile app and social media.

Suggested by the participants of NESCO and WZPDCL:

- ☑ Develop the technically skilled professional manpower through skilled and management development training for improving the company's work environment.
- ☑ Identify and repair the vulnerable and risky electricity substations and lines to avoid the unwanted accident.
- ☑ Recruit technically sound and qualified, skilled manpower considering the demand of the Organizations/ Companies.
- ☑ Deploy the high officials in the field for 8 to 10 years to learn the practical knowledge about the field work.

Suggested by the participants of BPDB:

- ☑ Provide a risk allowance for boosting the employee morale for doing the assigned work spontaneously.
- ☑ Ensure satisfactory services against the complaints of the customers by centers engaging skilled manpower.
- ☑ Arrange sufficient modern vehicles and repair the old vehicles and power supply lines for improving the present situation furthermore.

Suggested by the participants of DPDC:

- ☑ Require a Moving Vehicle Detection System to provide customer service from the control room instantly.
- ☑ Inform customer about the terms and conditions of the service through the mass media for the beforehand awareness.
- ☑ Build a data-based infrastructure through information, technology and innovative activities.
- ☑ Develop renewable energy sector for continuous power supply.
- ☑ Enhance the institutional efficiency and its capacity that can play an important role in improving the quality of customer service.
- ☑ Connect the prepaid meters with online facilities.
- ☑ Establish a process to Communicate with the customers through various media to build their awareness.
- ☑ Full activation of online system.
- ☑ Bringing the entire distribution system under prepaid metering.

- ☑ Overhead line needs to be underground to avoid the associated risk.
- ☑ Bring the complete management of power distribution networking under automation through GIS system.
- ☑ Increase the number of technical skilled manpower and through updated modern training.
- ☑ Introduce updated modern new technology for power management.
- ☑ Establish a complaint Centre at a customer friendly place.
- ☑ Shifting duty need be launched
- ☑ Full systems of power supply and distribution need be automated.
- ☑ Aware the customers about the best use of renewable energy by using the different print, electronic and online media.
- ☑ Introduce the Smart Complain Management Systems in power sector.
- ☑ Take projects for the development and automation of the power sector.

Suggested by the participants of WZPDCL:

- ☑ The length of 33 KV feeder is 10-20 km. Among these, the number of 33/11 kV substations need to be increased.
- ☑ Provide the standard quality electricity goods with zero faults.

Suggested by the participants of DESCO:

- ☑ Ensure high voltage operational safety for engineers,
- ☑ Design the modern electric Power systems design, modelling, analysis and problem solving
- ☑ Ensure advance power distribution for utilities.
- ☑ Introduce advance electric power and energy systems.
- ☑ Do planning and operation of smart power distribution systems.
- ☑ Introduce smart pre-paid meter systems.
- ☑ Ensure proper operation and maintenance of SCADA.
- ☑ Motivate the customers to come directly to the office and receive their expected customer services. More effective promotion is required for this purpose.
- ☑ Providing training to improve communication skills to communicate with customers.
- ☑ Starting of SCADA, GIS services.
- ☑ Modern scissor carts (cars with automatic ladders) can be used instead of manual ladders.
- ☑ Arrangement of related domestic and foreign training.

Suggested by the participants of BREB:

- ☑ Establish the call centers for 24/7.
- ☑ Bring the power distribution networking system under smart grid.
- ☑ Provide practical training on new technology and customer service to upgrade the professional skills.
- ☑ To resolve the Manpower crisis due to retirement, manpower may be recruited on the through outsourcing to handle the customer complaints efficiently.
- ☑ Develop the on-site distribution system to create a modern distribution network.
- ☑ Quickly implement the following- a) underground the electricity supply cable, b) introduce pre-payment meter (100%), c) smart grid, and d) fault locator should be set immediately for better customer services.
- ☑ Convert the model complaint center to customer service center to resolve all kinds of problems as expected by the customers.

Suggested by the participants of NESCO:

- ☑ Develop the existing distribution network along with an associated distribution system for better service.

SECTION 7: KEY INFORMANTS INTERVIEW

7.1 Preamble

Summarized and recorded below is the information that was gathered through the Key Informants Interviews with a cross section of experienced and knowledgeable people, i.e., Domestic, Industrial, LP, Irrigation and Commercial Customers (**Annexure-7**). This will certainly help the planners of Power Cell as well as BPDB[25], BREB[26], DESCO[27], DPDC[28], NESCO[29] and WZPDCL[30] in formulating a realistic plan of action for implementing the customer care services to augment the satisfaction and confidence level of their valued customers and strengthening the current activities and enhancing future development plan.

7.2 Findings of Intensive Interviews

A total of **29 Key informant interviews (KII)** (a list is given at **Annexure-7**) were conducted from 6 distribution Organizations/ Companies (BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL) to supplement the issues not raised in the quantitative survey. Different opinions regarding current service status, strength and weakness of providing service and suggestions for improving quality of rendering service were noted in the survey. All the KII participant's response spontaneously against the asked questions, which is informative and valuable suggestions for the continues improvement of the present situation.

7.3 Status of the KII Participants

The participants of KII were the persons who are holding leadership positions and pursuing diverse vocations and activities. The participants included as follows: Business Man-8, Social worker-1, retired army person-1, Councillor-3, Senior Consultant (Medicine)-1, President-1 (Business community), President-1 (shopping complex), President-1 (Ex-president FBCCI, Satkhira), Service-5, Chairman-1, Professor-1, Senior Electrical Engineer-1, Manager-1 (Electrical), General Secretary-1 (Shop Owner Traders Association), Assistant Engineer-1 (Electrical), Mayor-1.

7.4 KII Venue and Time

The Key informant interviews (KII)[31] were held at their individual place/office. Two Key informants were selected from BREB, DESCO, DPDC, NESCO and WZPDCL, and three Key informants were selected from BPDB. From March 2023 to April 2023, 29 Key informants were participated in the Key informant interview (**Annexure-7**). In total, the Key informative interviews were conducted at 14 zonal offices under 6 utilities.

[25] Bangladesh Power Development Board
[26] Bangladesh Rural Electrification Board
[27] Dhaka Electric Supply Company Limited
[28] Dhaka Power Distribution Company
[29] Northern Electricity Supply Company PLC
[30] West Zone Power Distribution Company Ltd.
[31] Key informant interviews

7.5 High-points of Key informant interviews (KII)

Bangladesh is situated in the fertile plains of the Padma, Meghna, Jamuna, Brahmaputra River and the border of Bay of Bengal. Topographically and ecologically, Bangladesh is not on the same plane. Some parts of the country are disaster prone and vulnerable to climate changes, and some are not. The authorities of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL planned, designed and implemented various customer care services through providing uninterrupted Electricity Distribution, with main objective of reducing dissatisfaction from the inner mind of their valuable customers. The information generated by 14 KII is submitted in the following sections:

7.5.1 Knowledge of Key Informants are regarding the services of Electricity Distribution Organizations/ Companies

All the Key Informants have in-depth professional knowledge about the asked questions and the country situation. They spontaneously disclose that; they are fully interested to answer the questions by these replies they are enthusiastically interested to involve in the development process of the customer service of the power distribution Organizations/ Companies to bring full satisfaction of the customers of six utilities.

1. **Opinion regarding the current status of customer service provided by Power Supply Organization /Company:**

Findings show that 'quality of customer service is highly satisfactory and updated than past' (100%). However, 'actually, major load shedding is occurred due to shortage of power supply from the national grid' (79.31%), while, about 75.86% perceived that 'during outage and shutdown maintenance, customers are notified'. This is followed by 'Customers can pay their electricity bill online digitally', 'Introduction of prepaid meters is a very good decision of the government and there is no additional charge for getting a new connection' (72.41%). Only 13.9% percent respondents perceived that 'due to transformation of BPDB to NESCO the service quality is improved'. Details are depicted below **(Table-98)**.

TABLE-98: RESPONDENT'S OPINION ON PRESENT STATUS OF CUSTOMER CARE SERVICES (MULTIPLE RESPONSES)

S/N	Opinion	BPDB		BREB		DPDC		DESCO		NESCO		WZPDCL		TOTAL	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
1.	Quality of customer service is highly satisfactory and updated than past	7	24.14	4	13.79	4	13.79	6	20.69	4	13.79	4	13.79	29	100.00
2.	Suffering due to corruption of the linemen	0	-	3	10.34	0	-	2	6.90	0	-	3	10.34	8	27.59
3.	Due to transformation of BPDB to NESCO the service quality is improved	0	-	0	-	0	-	0	-	4	13.79	0	-	4	13.79
4.	The power distribution Organization/ Company tries to provide the service very quickly and easily when the customer makes any complaint.	3	10.34	4	13.79	4	13.79	2	6.90	3	10.34	4	13.79	20	68.97
5.	The activities of broker dropped down and customers getting their required service directly from the distribution Organization/ Company.	2	6.90	0	-	0	-	0	-	4	13.79	2	6.90	6	20.69
6.	low voltage and fluctuation cause the damage of equipment, machinery and transformer	5	17.24	3	10.34	3	10.34	4	13.79	3	10.34	3	10.34	19	65.52
7.	Power distribution Organizations/ Companies always given priorities in supplying uninterrupted power to the industry.	4	13.79	3	10.34	3	10.34	4	13.79	3	10.34	2	6.90	19	65.52
8.	Actually, major load shedding is occurred due to shortage of power supply from the national grid.	5	17.24	4	13.79	4	13.79	6	20.69	2	6.90	2	6.90	23	79.31
9.	Customers can pay their electricity bill online digitally	5	17.24	4	13.79	4	13.79	4	13.79	2	6.90	2	6.90	21	72.41
10.	At present new customers are getting Electricity connection within 15 days.	5	17.24	4	13.79	3	10.34	4	13.79	2	6.90	2	6.90	20	68.97
11.	During outage and shutdown maintenance, customers are notified	3	10.34	4	13.79	4	13.79	5	17.24	2	6.90	4	13.79	22	75.86
12.	Introduction of prepaid meters is a very good decision of the government and there is no additional charge for getting a new connection	3	10.34	3	10.34	4	13.79	5	17.24	2	6.90	2	6.90	21	72.41

2. Opinion regarding steps that should be taken to develop good relationship between Power Distribution Organization/ Company and Customer:

Regarding the quality improve measures, about 96.55% respondents opined that there is a need to 'increase power generation to enhance the customer satisfaction'. A little over 93.10% respondents perceived that 'to provide quality and faster service, arrange monitoring meeting on regular basis to build strong relationship with customer'. The other opinion they mentioned are 'provide good quality batteries with pre-paid meter' (82.76%), 'information about maintenance and outage schedule through miking, messaging, social media notifications and SMS for customer awareness' (82.76%), 'Provide good quality batteries with pre-paid meter' (82.76%), 'replace the overhead bare, hazardous and risky electricity line by insulated electricity line' (86.21%), 'Due to road digging and construction work the underground power supply line is disconnected'(86.21%), 'it needs to be done in coordination with power distribution Organization/ Company' (86.21%). The only 13.79% recommended to 'Set up a power plant in Rangpur for uninterrupted power supply'. Details are enunciated at **Table-99** below:

TABLE-99: RESPONDENT'S OPINION ON THE STEPS THAT SHOULD BE TAKE TO DEVELOP GOOD RELATIONSHIP BETWEEN POWER DISTRIBUTION ORGANIZATION /COMPANY AND CUSTOMER (MULTIPLE RESPONSE)

S/N	Opinion	BPDB		BREB		DPDC		DESCO		NESCO		WZPDCL		TOTAL	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
1.	Increase power generation to enhance the customer satisfaction	5	17.24	4	13.79	3	10.34	6	20.69	4	13.79	4	13.79	28	96.55
2.	To provide quality and faster service, arrange monitoring meeting on regular basis to build strong relationship with customer	7	24.14	4	13.79	2	6.90	6	20.69	4	13.79	4	13.79	27	93.10
3.	Set up a power plant in Rangpur for uninterrupted power supply.	0	-	0	-	0	-	0	-	4	13.79	0	-	4	13.79
4.	Information about maintenance and outage schedule through miking, messaging, social media notifications and SMS for customer awareness.	5	17.24	4	13.79	4	13.79	5	17.24	3	10.34	3	10.34	24	82.76
5.	Replace the overhead bare, hazardous and risky electricity line by insulated electricity line.	6	20.69	4	13.79	4	13.79	6	20.69	3	10.34	2	6.90	25	86.21
6.	Increase the Technical Manpower of Maintenance and customer service team along with required vehicles.	5	17.24	4	13.79	3	10.34	2	6.90	3	10.34	3	10.34	20	68.97
7.	Convert the OLTCs from manual to automation.	2	6.90	2	6.90	1	3.45	3	10.34	2	6.90	1	3.45	11	37.93
8.	Due to road digging and construction work the underground power supply line is disconnected. it needs to be done in coordination with power distribution Organization/ Company.	7	24.14	4	13.79	4	13.79	6	20.69	2	6.90	2	6.90	25	86.21
9.	Provide good quality batteries with pre-paid meter	5	17.24	4	13.79	4	13.79	5	17.24	3	10.34	3	10.34	24	82.76
10.	Introduce 24 hours service program.	6	20.69	3	10.34	2	6.90	5	17.24	4	13.79	4	13.79	22	75.86

3. Opinion regarding the power supply Organization/Company- customers' major expectations are minimum load-shedding, active electric connection ASAP, easily can pay electric bill - do you think the expectations are full filled:

About 100% respondents perceived that 'load-shedding is much less than before' and 'Prime expectation of the customer is uninterrupted power supply', while 93.10% respondents perceived that 'Online billing system is very modern and transparent which is better than before and the customer able to pay from home'. About 86.21% respondents perceived that 'It is still room for improving the expected services for the customers' whereas only 75.86% perceived that 'Earlier load shedding was 10-12 times but now load shedding is 1-2 times a day in hot season and no-load shedding in winter' followed by 'Load shedding occurs when there is a problem in the national grid' (72.41%), 'Expectations the customers have been 100% fulfilled' (65.52%), 'successful in gaining customer confidence due to short duration of power outage' (62.07%), 'Bill payment is much easier and less hassle due to prepaid meter' (58.62%) and 'Issuing Post-paid bill before the last date of bill payment which is totally inconvenient for the customer' (55.17%). Details are furnished at **Table-100** below:

TABLE-100: PERCEPTION ON CUSTOMER'S EXPECTATIONS OF MINIMUM LOAD SHEDDING, QUICK ELECTRICITY CONNECTION AND ABILITY TO PAY BILL EASILY (MULTIPLE RESPONSE)

S/N	Opinion	BPDB		BREB		DPDC		DESCO		NESCO		WZPDCL		TOTAL	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
1.	Load-shedding is much less than before	7	24.14	4	13.79	4	13.79	6	20.69	4	13.79	4	13.79	29	100.00
2.	It is still room for improving the expected services for the customers.	5	17.24	3	10.34	4	13.79	5	17.24	4	13.79	4	13.79	25	86.21
3.	Prime expectation of the customer is uninterrupted power supply.	7	24.14	4	13.79	2	6.90	6	20.69	4	13.79	4	13.79	29	100.00
4.	Earlier load shedding was 10-12 times but now load shedding is 1-2 times a day in hot season and no-load shedding in winter.	6	20.69	3	10.34	3	10.34	4	13.79	3	10.34	3	10.34	22	75.86
5.	Expectations the customers have been 100% fulfilled	6	20.69	3	10.34	3	10.34	3	10.34	3	10.34	1	3.45	19	65.52
6.	95% successful in gaining customer confidence due to short duration of power outage	6	20.69	3	10.34	3	10.34	2	6.90	3	10.34	1	3.45	18	62.07
7.	Load shedding occurs when there is a problem in the national grid	4	13.79	4	13.79	3	10.34	3	10.34	4	13.79	3	10.34	21	72.41
8.	Online billing system is very modern and transparent which is better than before and the customer able to pay from home.	7	24.14	4	13.79	4	13.79	6	20.69	3	10.34	3	10.34	27	93.10
9.	Bill payment is much easier and less hassle due to prepaid meter	5	17.24	2	6.90	2	6.90	4	13.79	2	6.90	2	6.90	17	58.62
10.	Issuing Post-paid bill before the last date of bill payment which is totally inconvenient for the customer	3	10.34	3	10.34	2	6.90	3	10.34	2	6.90	2	6.90	16	55.17

4. Power supply Organization /Company keeps complaint record & give solution within a short –time regarding this, what's your opinion:

About 93.10% respondents expressed that 'Electricity distribution Organizations/ Companies provide faster service to the customer according to the need of them' and 'Skilled and technical manpower needs to increase for better customer service' while the other respondents stated that 'Call centre always call back to get confirmation about the location of the complainer and provide the customers requested service accordingly' (82.76%), 'Adopt a more digital approach to record the customer complaints' (75.86%), "Customer complaints are taken seriously, recorded and do the needful to resolve the problem immediately' (72.41%), 'Due to shortage of manpower, Distribution Organizations/ Companies are unable to provide service on time' (68.97%), 'In-depth monitoring team is needed to resolve grievance redressal as expected by the complainer' (68.97%), 'After listening complaint regarding transformer breaks down, the maintenance team acted fast to resolve the problem. But the ordinary customers are not treated equally' (55.17%), 'Due to lack of manpower compared to the requirement, the problem solving is delayed in some areas' (48.28%) and 'DESCO provides to solve the complaints of the industries /factories/ commercial establishment quickly than the residential customers' (20.69%). Only 13.79% of the respondents perceived that 'NESCO still takes complaint on paper, which causes a lot of hassle for customers to go around with files' they also added that 'There are many brokers in NESCO who are doing contract work for customers which are causing extra cost to customers, these should be stopped'. Details are furnished at **Table-101** below:

TABLE- 101: OPINION ON RECORDING COMPLAINT AND PROVIDING SOLUTION WITHIN A SHORT-TIME OF THE POWER DISTRIBUTION ORGANIZATIONS/ COMPANIES (%)

S/N	Opinion	BPDB		BREB		DPDC		DESCO		NESCO		WZPDCL		TOTAL	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
1.	Electricity distribution Organizations/ Companies provide faster service to the customer according to the need of them.	6	20.69	4	13.79	4	13.79	5	17.24	4	13.79	4	13.79	27	93.10
2.	Due to shortage of manpower, Distribution Organizations/ Companies are unable to provide service on time.	5	17.24	3	10.34	3	10.34	3	10.34	3	10.34	3	10.34	20	68.97
3.	Adopt a more digital approach to record the customer complaints.	3	10.34	4	13.79	3	10.34	5	17.24	4	13.79	3	10.34	22	75.86
4.	DESCO provides to solve the complaints of the industries /factories/ commercial establishment quickly than the residential customers.	0	-	0	-	0	-	6	20.69	0	-	0	-	6	20.69
5.	NESCO still takes complaints on paper, which causes a lot of hassle for customers to go around with files.	0	-	0	-	0	-	0	-	4	13.79	0	-	4	13.79
6.	In-depth monitoring team is needed to resolve grievance redressal as expected by the complainer.	3	10.34	4	13.79	4	13.79	4	13.79	3	10.34	2	6.90	20	68.97
7.	Skilled and technical manpower needs to increase for better customer service.	5	17.24	4	13.79	4	13.79	6	20.69	4	13.79	4	13.79	27	93.10
8.	Call centre always call back to get confirmation about the location of the complainer and provide the customers requested service accordingly.	6	20.69	4	13.79	4	13.79	6	20.69	1	3.45	3	10.34	24	82.76
9.	There are many brokers in NESCO who are doing contract work for customers which are causing extra cost to customers, these should be stopped.	0	-	0	-	0	-	0	-	4	13.79	0	-	4	13.79
10.	Customer complaints are taken seriously, recorded and do the needful to resolve the problem immediately.	5	17.24	4	13.79	4	13.79	4	13.79	1	3.45	3	10.34	21	72.41
11.	After listening complaint regarding transformer breaks down, the maintenance team acted fast to resolve the problem. But the ordinary customers are not treated equally.	4	13.79	2	6.90	1	3.45	2	6.90	4	13.79	3	10.34	16	55.17
12.	Due to lack of manpower compared to the requirement, the problem solving is delayed in some areas.	2	6.90	2	6.90	2	6.90	3	10.34	3	10.34	2	6.90	14	48.28

5. Opinion regarding the strength & weakness (SWOT) of Power Supply Organization/ Company to ensure customer service:

STRENGTH:

The majority of the respondents (89.66%) considered that the biggest strength of the Power Distribution Organizations/ Companies are - 'Technical persons and service team are well equipped and skilled' and 'Organizations/ Companies have strong power distribution network'. The other options they perceived are - 'The senior officials are always sincere in solving the problems of their customers.' (79.31%) followed by 'Present technology and customer care services are more advanced than before' (75.86%), 'Maintenance Teams are very active and skilled to resolve the problem.' and 'Prepaid meters is an added strength' (72.41%). Only 58.62% of the respondents stated that 'Customers are now getting 24 hours uninterrupted power which is much better than past'.

WEAKNESS:

Almost all of the respondents (100%) denoted that the biggest weakness of the Power Distribution Organizations/ Companies are - 'Lack of training for the technical and customer service team.' and 'Low voltage causes disruption of production'. The other options they perceived are - 'Ordinary customers are not treated equally' (82.76%), 'Sometime meter readers provide false reading to customers' (65.52%), 'The price of electricity is gradually increasing' (62.07%), 'Still using bare conductor' (48.28%), 'Shortage of electricity compared to demand' (44.83%), 'The website needs to be improved' and 'Lack of knowledgeable and technically qualified manpower and required vehicles' (37.93%). Only 31.03% of the respondents perceived that 'Load Shedding is very high during Summer'. **Details are furnished at Table-102 below:**

TABLE 102: OPINION ON BIGGEST STRENGTH AND WORST WEAKNESS (SWOT) OF THE POWER SUPPLY ORGANIZATION/COMPANY TO ENSURE CUSTOMER SERVICE

S/N	Opinion	BPDB		BREB		DPDC		DESCO		NESCO		WZPDCL		TOTAL	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
STRENGTH:															
1.	Technical persons and service team are well equipped and skilled	7	24.14	4	13.79	4	13.79	5	17.24	3	10.34	3	10.34	26	89.66
2.	Customers are now getting 24 hours uninterrupted power which is much better than past	5	17.24	2	6.90	2	6.90	4	13.79	2	6.90	2	6.90	17	58.62
3.	The senior officials are always sincere in solving the problems of their customers.	6	20.69	3	10.34	3	10.34	5	17.24	3	10.34	3	10.34	23	79.31
4.	Present technology and customer care services are more advanced than before	4	13.79	4	13.79	3	10.34	4	13.79	3	10.34	4	13.79	22	75.86
5.	Maintenance Teams are very active and skilled to resolve the problem.	6	20.69	3	10.34	3	10.34	5	17.24	2	6.90	2	6.90	21	72.41
6.	Organizations/ Companies have strong power distribution network	6	20.69	4	13.79	4	13.79	6	20.69	3	10.34	3	10.34	26	89.66
7.	Prepaid meters are an added strength	5	17.24	2	6.90	3	10.34	5	17.24	3	10.34	3	10.34	21	72.41
WEAKNESS:															
1.	Shortage of electricity compared to demand	5	17.24	3	10.34	1	3.45	2	6.90	1	3.45	1	3.45	13	44.83
2.	Load Shedding is very high during Summer	3	10.34	2	6.90	1	3.45	1	3.45	1	3.45	1	3.45	9	31.03
3.	The price of electricity is gradually increasing	4	13.79	3	10.34	3	10.34	2	6.90	3	10.34	3	10.34	18	62.07
4.	The website needs to be improved	2	6.90	2	6.90	1	3.45	3	10.34	1	3.45	2	6.90	11	37.93
5.	Lack of knowledgeable and technically qualified manpower and required vehicles	3	10.34	2	6.90	1	3.45	2	6.90	1	3.45	2	6.90	11	37.93
6.	Still using bare conductor	3	10.34	2	6.90	2	6.90	3	10.34	2	6.90	2	6.90	14	48.28
7.	Sometime meter readers provide false reading to customers	4	13.79	3	10.34	4	13.79	3	10.34	3	10.34	2	6.90	19	65.52
8.	Ordinary customers are not treated equally	5	17.24	4	13.79	4	13.79	4	13.79	4	13.79	3	10.34	24	82.76
9.	Lack of training for the technical and customer service team.	7	24.14	4	13.79	4	13.79	6	20.69	4	13.79	4	13.79	29	100.00
10.	Low voltage causes disruption of production	7	24.14	4	13.79	4	13.79	6	20.69	4	13.79	4	13.79	29	100.00

6. Opinion regarding the steps power supply Organization/Company can take to avoid Electricity accident & customers' safety:

The majority of the respondent (82.21%) stated that 'Unauthorised and Risky bare lines must be removed by insulated cable and repair power lines quickly and power cables should be passed through underground', while 62.07% of the respondents considered that 'Consumer awareness meeting is the most important thing to prevent Electricity accidents'. Other respondents perceived that the power supply Organizations/ Companies should take the following steps - 'To avoid accidents and provide safety to the customer, invalid and old cables should be replaced using modern equipment. Keep housing at a distance of 8-9 feet from the main line.' (55.17%), 'Power supply lines in slum areas are in danger, replaced this by safer lines immediately.' (51.72%) and 'Electricity officials should regularly check transformers and lines' (41.38%). On the other hand, they suggested that 'NESCO should carry out area-wise campaigns to prevent electricity accidents and create awareness among people about how to remedy them', 'To avoid accidents, NESCO employees should be trained in modern equipment through fire service personnel' and 'Modernization of line observation system' (41.38%). The other respondents perceived as follows - 'Number of the transformer should be increased and fix all loose connections to avoid accidents.' (37.93%), 'Main connections at customer place rusted and catch fire occasionally. Hence connection lines should be cleaned regularly', 'Ban on battery operated vehicles and regular trimming of large branches of trees' and 'Use of modern transformers and spare parts' (34.48%), while 31.03% respondents mentioned that the Organizations/ Companies should take the following initiatives - 'Investigate Electricity line faults periodically and take prompt action', 'Removal of T&T, dish and other unnecessary cables from electricity poles' and 'The load level of the transformer must be increased otherwise the transformer will burn out on overload'. Respondents also added that the following responses should be considered to avoid electricity accident and ensure customers' safety - 'Knowledgeable and technically qualified skilled manpower should be increased for better customer service', 'Replacement of expired spare parts' and 'voltage fluctuations and Accidents occur occasionally due to faulty connection' (24.14%). Details are portraited at **Table-103** below:

TABLE-103: OPINION REGARDING THE STEPS POWER SUPPLY ORGANIZATION/COMPANY SHOULD TAKE TO AVOID ELECTRICITY ACCIDENT AND ENSURE THE CUSTOMERS' SAFETY (%)

S/N	Opinion	BPDB		BREB		DPDC		DESCO		NESCO		WZPDCL		TOTAL	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
1.	Unauthorised and Risky bare lines must be removed by insulated cable and repair power lines quickly and power cables should be passed through underground.	6	20.69	4	13.79	4	13.79	6	20.69	2	6.90	3	10.34	25	86.21
2.	To avoid accidents and provide safety to the customer, invalid and old cables should be replaced using modern equipment. Keep housing at a distance of 8-9 feet from the main line.	4	13.79	2	6.90	2	6.90	3	10.34	3	10.34	2	6.90	16	55.17
3.	Consumer awareness meeting is the most important thing to prevent Electricity accidents	4	13.79	3	10.34	3	10.34	3	10.34	2	6.90	3	10.34	18	62.07
4.	Power supply lines in slum areas are in danger, replaced this by safer lines immediately.	3	10.34	2	6.90	3	10.34	3	10.34	3	10.34	1	3.45	15	51.72
5.	Number of the transformer should be increased and fix all loose connections to avoid accidents.	4	13.79	1	3.45	1	3.45	1	3.45	2	6.90	2	6.90	11	37.93
6.	Main connections at customer place rusted and catch fire occasionally. Hence connection lines should be cleaned regularly.	3	10.34	2	6.90	1	3.45	1	3.45	2	6.90	1	3.45	10	34.48
7.	Knowledgeable and technically qualified skilled manpower should be increased for better customer service.	2	6.90	1	3.45	1	3.45	1	3.45	1	3.45	1	3.45	7	24.14
8.	Ban on battery operated vehicles and regular trimming of large branches of trees.	3	10.34	2	6.90	1	3.45	2	6.90	1	3.45	1	3.45	10	34.48
9.	Investigate Electricity line faults periodically and take prompt action	4	13.79	1	3.45	1	3.45	1	3.45	1	3.45	1	3.45	9	31.03
10.	Removal of T&T, dish and other unnecessary cables from electricity poles	3	10.34	1	3.45	2	6.90	1	3.45	1	3.45	1	3.45	9	31.03
11.	The load level of the transformer must be increased otherwise the transformer will burn out on overload	3	10.34	1	3.45	2	6.90	1	3.45	1	3.45	1	3.45	9	31.03
12.	Modernization of line observation system	4	13.79	1	3.45	3	10.34	2	6.90	1	3.45	1	3.45	12	41.38
13.	Use of modern transformers and spare parts	3	10.34	2	6.90	2	6.90	1	3.45	1	3.45	1	3.45	10	34.48
14.	Replacement of expired spare parts	1	3.45	1	3.45	2	6.90	1	3.45	1	3.45	1	3.45	7	24.14
15.	voltage fluctuations and Accidents occur occasionally due to faulty connection	1	3.45	1	3.45	2	6.90	1	3.45	1	3.45	1	3.45	7	24.14
16.	Electricity officials should regularly check transformers and lines	3	10.34	1	3.45	2	6.90	2	6.90	2	6.90	2	6.90	12	41.38
17.	NESCO should carry out area-wise campaigns to prevent electricity accidents and create awareness among people about how to remedy them.	3	10.34	2	6.90	2	6.90	2	6.90	1	3.45	2	6.90	12	41.38
18.	To avoid accidents, NESCO employees should be trained in modern equipment through fire service personnel	4	13.79	2	6.90	2	6.90	2	6.90	2	6.90	1	3.45	12	41.38

7. Recommendations to develop customer service which is delivered by a Power Supply Organization/Company:

Majority of the respondents (58.62%) suggested to 'Take Concrete initiative to set-up a separate required sub-station for big industries to ensure better service' while 55.17% of the respondents recommended to 'Increase the number of quality maintenance equipment, cables and spare parts (international standards) considering the expectation of the customers. Besides that, strengthened the monitoring system for better management and satisfactory customer service'.

The key informants (48.28%) expressed their thoughtful suggestions as follows - 'Manpower should be increased and knowledgeable and technically qualified manpower should be employed considering the work of the Organization/ Company', 'Arrange technical and customer service training to develop the specialised manpower for better management and service', 'Updated equipment and vehicles should be added to the team's fleet for prompt response against the customer call' and 'The number of the maintenance team should be increased considering the work load for frequent line observation and effective maintenance'.

Around 44.83% of the respondents urge to 'Fix the price of electricity based on the purchasing power of the customers considering the socio-economic condition of the country. And also ensure the uninterrupted power supply to keep the temper of the customer'. They also added that 'Electricity should be provided by keeping the price of electricity at an affordable level and ensure uninterrupted power supply'.

The interviewed respondents (37.93%) expressed their thoughtful opinion for the improvement of the current situation as follows – 'Customer Service should be faster as expected by the complainer', 'Ensure that customers are not harassed', 'Customer service centre should be managed by the knowledgeable and skilled manpower', 'Keeping special customer service team ready to handle the emergencies situation', 'Arrange a customer's awareness meeting with the customers on a regular basis and promote the power distribution activities through usable media for better understanding of the customers', 'Keeping the service team active 24 hours to meet the emergency situation' and 'Billing and communication should be developed through IT Section, Hotline Number, Software, Website, BKash, Nagad, Rocket etc.'

Another group (37.93%) raised their options as follows - 'Committee should be formed by comprising public representatives, social worker valid customer and prominent businessmen to settle all the redressal of grievance amiably for flawless customer service".

For better customer service 34.48% respondents put-forth their valuable opinion as follows - 'Remove the T&T cable, dish and other unnecessary cables from electricity poles to stop the unwanted risky accident', 'the action should be taken immediately to stop unauthorised and illegal activities', 'Increase unit slab from 75 to 200 units (first slab)' and 'A slab system of electricity bill for residential customers should be brought down up-to a tolerable level'.

The respondents (27.59%) think that Power Generation Organizations/ Companies should – 'Increase the power generation and supply for uninterrupted power supply for better customer satisfaction'.

About 24.14% respondents recommended for 'Using of international quality overhead Insulated conductor for the power transmission line'. They also insist to - 'Convert all the post-paid meters to prepaid meter for hassle-free bill payment', 'Analog meters should be replaced with prepaid meters; this will remove the doubt among people about meter reading' and 'Reduce the prepaid meter's recharge digits and simplifying the loading system'.

The respondents (20.69%) requested to- 'Strengthen the monitoring system by the authorities to reduce customer suffering especially during natural calamities. They also prayed to the Power Distribution Organizations/ Companies for - 'Using underground power lines in Chattogram which will reduce the risky fire and dangerous accidents' and 'Form a qualified Rapid Action Team to take effective action to recharge the pre-paid meter and take necessary correction of the errors'.

The respondents (17.24%) are recommended to create better customers service by taking the following actions–'Take prompt action in the case of faulty prepaid meter loading service which is causing a lot of suffering to the customer', 'Cables of specific voltages should be blogging on one pole instead of cables of multiple voltages on one pole', 'Behaviour of the official should be modified to handle the customers more gently to uphold their satisfaction level', 'Load distribution should be made according to the capacity of the transformer' and 'Regular monitoring and supervision are required'.

The respondents (13.79%) suggested that 'If needed NESCO employees should go to the field to improve the quality of customer service', 'All officials should be more attentive, sober and well behave with the customers', 'Public relations and complaints should be handled amicably', 'NESCO's services should be provided door-to-door as per the need of the general customers', 'In order to reduce the price of electricity and to avoid load-shedding, initiatives should be taken to install new power plants', 'More projects like - Rooppur Nuclear Power Plant, should be taken up to solve the Electricity problem', 'Pay more attention to generate more power according to customer demand', 'A strong awareness campaign should be arranged to make the power sector corruption free totally', 'Above all, NESCO needs to be more conscious to reduce customer's suffering', 'Set-up a 24-hour complaint centre and provides complaint-based proper solution as expected by the customers', 'Reduce the number of recharge digits in the prepaid meters', 'Unauthorized Line should be removed immediately, to ensure the uninterrupted power supply to legitimate customers by shutting down illegal connections', 'Introduce the 24 hours load checking system' and 'Providing technical and customer service training to the employees to handle the customer amicably and the management system effectively furthermore which will eventually prevent the corruption'.

Only 10.34% of the respondents said that 'Various government prescribed fees/charges shall be waived or reduced or cancelled' and 're-charging of battery-operated vehicles through illegal lines should be stopped'. **The Details are described below (Table-104):**

TABLE-104: SUGGESTIONS FOR IMPROVING THE CURRENT CUSTOMER SERVICES BY THE POWER DISTRIBUTION ORGANIZATIONS/ COMPANIES (%)

S/N	Opinion	BPDB		BREB		DPDC		DESCO		NESCO		WZPDCL		TOTAL	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
1.	Increase the power generation and supply for uninterrupted power supply for better customer satisfaction.	1	3.45	1	3.45	3	10.34	1	3.45	1	3.45	1	3.45	8	27.59
2.	Customer Service should be faster as expected by the complainer. Ensure that customers are not harassed. Customer service centre should be managed by the knowledgeable and skilled manpower. Keeping special customer service team ready to handle the emergencies situation. Arrange a customer's awareness meeting with the customers on a regular basis and promote the power distribution activities through usable media for better understanding of the customers. Keeping the service team active 24 hours to meet the emergency situation. Billing and communication should be developed through IT Section, Hotline Number, Software, Website, BKash, Nagad, Rocket etc.	2	6.90	2	6.90	1	3.45	4	13.79	1	3.45	1	3.45	11	37.93
3.	If needed NESCO employees should go to the field to improve the quality of customer service. All officials should be more attentive, sober and well behave with the customer. Public relations and complaints should be handled amicably. NESCO's services should be provided door-to-door as per the need of the general customers. In order to reduce the price of electricity and to avoid load-shedding, initiatives should be taken to install new power plants. More projects like - Rooppur Nuclear Power Plant, should be taken up to solve the Electricity problem. Pay		-		-		-		-	4	13.79		-	4	13.79

S/N	Opinion	BPDB		BREB		DPDC		DESCO		NESCO		WZPDCL		TOTAL	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	more attention to generate more power according to customer demand. A strong awareness campaign should be arranged to make the power sector corruption free totally. Above all, NESCO needs to be more conscious to reduce customer's suffering. Set-up a 24-hour complaint centre and provides complaint-based proper solution as expected by the customers. Reduce the number of recharge digits in the prepaid meters.														
4.	Using of international quality overhead Insulated conductor for the power transmission line.	2	6.90	1	3.45	1	3.45	1	3.45	1	3.45	1	3.45	7	24.14
5.	Take prompt action in the case of faulty prepaid meter loading service which is causing a lot of suffering to the customer	1	3.45	0	-	1	3.45	1	3.45	0	-	2	6.90	5	17.24
6.	Strengthen the monitoring system by the authorities to reduce customer suffering especially during calamities.	1	3.45	1	3.45	1	3.45	1	3.45	0	-	2	6.90	6	20.69
7.	Convert all the post-paid meters to prepaid meter for hassle-free bill payment. Analog meters should be replaced with prepaid meters; this will remove the doubt among people about meter reading. Reduce the prepaid meter's recharge digits and simplifying the loading system.	1	3.45	1	3.45	1	3.45	2	6.90	0	-	1	3.45	7	24.14
8.	Fix the price of electricity based on the purchasing power of the customers considering the socio-economic condition of the country. And also ensure the uninterrupted power supply to keep the temper of the customers. Electricity should be provided by keeping the price of electricity at an affordable level and ensure uninterrupted power supply.	2	6.90	3	10.34	1	3.45	4	13.79	2	6.90	1	3.45	13	44.83

S/N	Opinion	BPDB		BREB		DPDC		DESCO		NESCO		WZPDCL		TOTAL	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
9.	Various government prescribed fees/charges shall be waived or reduced or cancelled.	0	-	3	10.34		-		-		-		-	3	10.34
10.	Manpower should be increased and knowledgeable and technically qualified manpower should be employed considering the work of the Organization/ Company. Arrange technical and customer service training to develop the specialised manpower for better management and service. Updated equipment and vehicles should be added to the team's fleet for prompt response against the customer call. The number of the maintenance team should be increased considering the work load for frequent line observation and effective maintenance.	2	6.90	4	13.79	4	13.79	1	3.45	0	-	3	10.34	14	48.28
11.	Remove the T&T cable, dish and other unnecessary cables from electricity poles to stop the unwanted risky accident. The action should be taken immediately to stop unauthorised and illegal activities.	2	6.90	1	3.45	1	3.45	3	10.34	1	3.45	2	6.90	10	34.48
12.	Using underground power lines in Chittagong which will reduce the risky fire and dangerous accidents.	6	20.69		-		-		-		-		-	6	20.69
13.	Increase the number of quality maintenance equipment, cables and spare parts (international standards) considering the expectation of the customers. Besides that, strengthened the monitoring system for better management and satisfactory customer service.	3	10.34	3	10.34	4	13.79	2	6.90	1	3.45	3	10.34	16	55.17
14.	Take Concrete initiative to set-up a separate required sub-station for big industries to ensure better service.	5	17.24	1	3.45	3	10.34	4	13.79	1	3.45	3	10.34	17	58.62
15.	Form a qualified Rapid Action Team to take effective action to recharge the pre-paid meter and take necessary correction of the errors.	0	-	3	10.34	0	-	0	-	0	-	3	10.34	6	20.69

S/N	Opinion	BPDB		BREB		DPDC		DESCO		NESCO		WZPDCL		TOTAL	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
16.	Increase unit slab from 75 to 200 units (first slab). A slab system of electricity bill for residential customers should be brought down up-to a tolerable level.	1	3.45	2	6.90	1	3.45	1	3.45	1	3.45	4	13.79	10	34.48
17.	Introduce the 24 hours load checking system.	4	13.79	0	-	0	-	0	-	0	-	0	-	4	13.79
18.	Cables of specific voltages should be blogging on one pole instead of cables of multiple voltages on one pole	5	17.24	0	-	0	-	0	-	0	-	0	-	5	17.24
19.	Load distribution should be made according to the capacity of the transformer. Regular monitoring and supervision are required.	5	17.24	0	-	0	-	0	-	0	-	0	-	5	17.24
20.	Unauthorized Line should be removed immediately, to ensure the uninterrupted power supply to legitimate customers by shutting down illegal connections.	0	-	0	-	0	-	4	13.79	0	-	0	-	4	13.79
21.	Re-charging of battery-operated vehicles through illegal lines should be stopped	0	-	0	-	0	-	3	10.34	0	-	0	-	3	10.34
22.	Behaviour of the official should be modified to handle the customers more gently to uphold their satisfaction level.	0	-	0	-	0	-	5	17.24	0	-	0	-	5	17.24
23.	Providing technical and customer service training to the employees to handle the customer amicably and the management system effectively furthermore which will eventually prevent the corruption.	0	-	0	-	0	-	0	-	0	-	4	13.79	4	13.79
24.	Committee should be formed by comprising public representatives, social worker valid customer and prominent businessmen to settle all the redressal of grievance amiably for flawless customer service.	4	13.79	3	10.34	0	-	0	-	0	-	4	13.79	11	37.93

SECTION 8: CASE STUDY

8.1 Case Study-1(Dhaka, DPDC)

Mr. Md. Jahid Hassan

M/S Sonali Plastic, Proprietor (Plastic Molding)

ELECTRICITY ENLIGHTENS THEIR LIVES

Jahid Hassan, a resident of Islam Bug in Old Dhaka, is a firm believer in his family's legacy. Jahid's father, a smart young man, established a rare business in plastic resin during his time. Unfortunately, after Jahid's father passed away, the business came to a halt while Jahid was still very young.

Jahid often reminisces about the days when his household was filled with happiness and prosperity. He had a younger sister who barely had enough to eat and wore hand-me-downs from Jahid's own childhood. These memories deeply affected Jahid, and his sensitive mind pondered on ways to improve his family's income. Focusing on his father's previous venture, he decided to pick up where they had left off. Jahid rented some machinery to revive their old family business of manufacturing plastic resin. With a mixture machine, a Duri machine, and a Duri cutter at his disposal, he embarked on this new journey.

In just five years, Jahid has made remarkable progress. He now owns his own machinery, employs several workers, and operates two factories. He has established relationships with wholesale buyers for raw materials and both wholesale and retail buyers for finished goods such as plastic mugs and buckets.

Jahid acknowledges that without uninterrupted electricity, his family business would not have achieved its current success. He considers electricity to be the cornerstone of his business, allowing him to start afresh and reach this far. Consequently, Jahid expresses his heartfelt gratitude to the Bangladesh Government for providing uninterrupted electricity, which has truly enlightened their lives along with sound financial freedom.



8.2 Case Study-2 (Dhaka, DESCO)
Mr. Md Selim Jabed
M/S Lam Yah Fashion, Chairman (Garments)

LAMP OF ALADDIN

Md Nurul Islam's family resides in Uttara, while his siblings’ pursued studies and aimed to settle abroad. He chose to stay in his beloved city and establish his own small knitting business. His factory is located in nearby Tongi.

Electricity has been the primary source for his business. However, there was a period when voltage was low, and electricity would be unavailable for nearly half of the working time. Load shedding occurred almost every other hour, presenting a significant obstacle in achieving the estimated production targets each month. In their earnest efforts, they resorted to using generators to sustain production. Unfortunately, the high cost of oil made their production expenses soar, leaving them with insufficient profits. Fortunately, the implementation of a remote electric power supply resolved their challenges. With an uninterrupted work environment and a smooth electricity supply, Nurul Islam's business thrived, occasionally surpassing the estimated profit margins. The reduction in excessive load shedding greatly improved their income and lifestyle. Presently, Md Nurul Islam owns 76 knitting machines and employs over 200 individuals. With a composed way of life, he expanded his business from the knitting industry to include a construction business.

Nurul Islam firmly believes in creating a future for his sons and is determined to keep expanding until they eventually take over. He boldly asserts that electricity is undeniably a fundamental necessity in today's world. He expresses his gratitude to the Bangladesh Government for providing uninterrupted electricity, which has empowered him to plan and rely on a sustainable future. He sincerely appreciates the uninterrupted electricity provided by the Government of Bangladesh, comparing it to the mythical Lamp of Aladdin.



8.3 Case Study-3 (Mymensingh, BREB)

Mr. Md Amir Hossain
Ma Agro Khamar, Owner (Farming)

CANDLE OF HOPE

For generations, Md. Amir Hossain's ancestors endured a life of hardship with minimal output. Initially, their livelihood was limited to fishing, paddy harvesting, and meager yields from a small number of farm animals. However, in the past decade, their circumstances changed when electric power was introduced to their family. This transformation brought about equal water supply to their crops throughout the seasons, effectively transforming their once barren lands.

With the availability of electric power, Md. Amir Hossain established a fishery and a farm with 20 cows, significantly boosting their paddy harvest. He also purchased an electric water pump to efficiently irrigate his fields, resulting in faster ploughing and improved grain cultivation. The introduction of the electric motor relieved them of the arduous labor they had previously endured and yielded abundant crops. The electric water pump not only facilitated better and faster irrigation but also reduced the workload for the farmers. Previously, the fishery often suffered from theft or poisoning of the fish, resulting in significant losses. However, with the advent of electricity, these incidents have been virtually eliminated.

It has now been a decade since they began benefiting from the electric power supply, and they cannot imagine life without it. Electricity has become indispensable in various aspects of their lives, from pumping water and ensuring equal distribution to cleaning, preservation, and ultimately, safety and sustenance. This newfound convenience has significantly improved their income, surpassing their previous earnings by over 30 percent. Md. Amir Hossain's family acknowledges that without electricity, their progress and development would have been hindered.

Words fail to express the depth of Md. Amir Hossain's gratitude to the Government of Bangladesh for providing uninterrupted electricity. It is truly a candle of hope in their lives for going further ahead.



8.4 Case Study-4 (Chittagong, BPDB)

Md Jashim Uddin

M/S Jashim Furniture Mart, Proprietor (Carpentry)

ELECTRICITY TRANSFORMS HIS LIFE

Jasim Uddin is a resident of Monsur Market in Chittagong. He is a smart young man who always wants to do something on his own. He has inherited the knowledge of various types of woodwork and carpentry. In 2004, he started working on woodcarving and various types of furniture using a chisel and a mallet.

However, despite working for a long time, he couldn't succeed financially. The manual design process took a lot of time, and he couldn't produce enough furniture every month or deliver them on time. He didn't have much left after paying the employees' salaries and shop rent, so his loving family always struggled with scarcity. Moreover, he couldn't pay the employees' salaries on time. These issues made him frequently depressed, and he wondered how to escape from these problems. But even after thinking, he couldn't find a way out.

Then, upon the advice of his close friend in 2016, he collected some money and sold some ancestral land to buy a CNC machine (Computer Numerical Control Machine). With the help of an electric CNC machine and uninterrupted electricity supply according to the demand, the woodworking and production of those products multiplied several times, and the efficiency of the workers also increased significantly. As a result, his business expanded, and his income multiplied several times. Later, with the profits from that shop, he opened two more furniture stores in the past five years. Now, a total of seven employees works in his shop, and he can pay them salaries on time. Additionally, stability has also come to his family.

He cannot thank enough to the Bangladesh Government for uninterrupted electricity. This electricity totally transforms his life and inspired him to flourish his business furthermore.

8.5 Case Study-5 (Chattogram, BPDB)

Ms. Momtaz Jahan
M/S Women’s Era, Owner (Mini Garments)

POWER BEING LIBERTY

Momtaz Jahan, the daughter of a middle-class family, has been an independent-minded person since her childhood. With a sick father at home, she always thought of doing something to support her family amidst the struggles of household chores. With that goal in mind, she embarked on a journey with 10 helpless, disabled, widowed, and abandoned women. She had a talent for beautiful drawings. She would design patterns on nakshi kantha, bedspreads, dresses, and sarees, and her workers would skillfully sew them. She would then sell the products through various means. With the income from her business, she not only covered her own expenses but also supported her two younger sisters in their education and managed the necessary expenses of the household.

After a few years, she got married, but her financial independence was still lacking. So, in pursuit of her financial freedom, she started raising a few cows for income and began fish farming in her father's pond. Additionally, she started various handicraft works with helpless widows and established a tailoring shop. Most of the women would gather in the afternoon, after finishing their household chores, to work there. However, at that time, there was no electricity available, so they couldn't work for long hours, and the production was also limited. Eventually, development began in Bashkhali Upazila, Chattogram and the supply of electricity started there.

After that, she started working on her projects with electricity connections and expanded her work in a larger area from 2010. She used aerator machines to increase oxygen for the fish, resulting in better fish production. Moreover, she started using motorized machines for sewing work. Subsequently, her business saw significant success. She provided employment to the people and established a factory and boutiques in Bashkhali. Currently, she has 20 employees working in her establishment. Today, due to this reliable electricity, her business has flourished, her income has increased, and she can handle both personal and social responsibilities without any worries. So, she extends her deepest thanks to the Bangladesh Government for uninterrupted electricity. She is enjoying the power being liberty in her successful life.



8.6 Case Study-6 (Khulna, WZPDCL)
Ms. Lucky Khatun
M/S Lucky Tailors, Owner (Mini Garments)

ELECTRICITY INSPIRED TO BECOME ENTREPRENEUR

Lucky Khatun was born into a low-income family in Kashipur, Khulna. The family constantly struggled with financial difficulties. While Lucky's father worked to support the household, her mother managed the household chores by stitching clothes for others. From a young age, Lucky learned sewing and the art of beautiful craftsmanship from her mother. She started assisting her mother in sewing work from that time. Lucky stitched clothes well and became well-known in her neighborhood for her skill.

When Lucky reached high school, her mother fell ill and became bedridden. The family once again faced financial hardships. Lucky couldn't see the light of hope in her area until she completed her high school education. However, she didn't want to keep her life in darkness. Alongside her studies, Lucky decided to help her family and become self-reliant by continuing the profession of stitching clothes.

She then took her passion as a profession. Lucky's life improved with the availability of electricity. She could pursue her stitching work alongside her education, day or night.

Initially, Lucky used an analog sewing machine. However, with the goal of increasing production and income, she followed a friend's advice. Lucky feels fortunate to have electricity in her life, as she soon purchased electric sewing machines for her tailoring business. With the electric machines, her production output increased, leading to higher income. To meet the growing demands, she even hired employees and acquired additional industrial sewing machines. Now she owns her own tailoring shop. Without electricity, Lucky couldn't have realized her dream of having her own shop. Electricity made Lucky self-reliant naturally.

Lucky is very grateful to the Bangladesh Government for the supply uninterrupted electricity, which led her to become a successful entrepreneur.

8.7 Case Study-7 (Rangpur, NESCO)

Mr. Krishna Roy

M/S Krishna S. S. Collection, Proprietor (Grill Designing and Production)

ELECTRICITY OPENED THE DOOR OF FORTUNE

Krishna Ray was born into a low-income family in Rangpur. Due to financial constraints and the chaotic household environment, his education was interrupted after primary school. To support his family, he started working at a steel factory in the city at the age of fourteen in 2004. There, he learned to work on steel gates, balcony railings, and staircase railings.

Despite working tirelessly day and night for many years, their family did not experience prosperity. The number of family members increased, and poverty remained persistent. However, amidst all this, his skill in craftsmanship spread far and wide. Despite being diligent and skilled, after working at the steel factory for fourteen years, Krishna Ray did not witness any improvement in his family's financial condition. Upon the advice of his uncle's brother, he took a loan and started his own small workshop near his home in 2018. However, he couldn't generate much profit from manual labor alone. Some tasks required the use of electric machinery, but electricity was not available in their area, so he had to go to the city to accomplish them, resulting in increased expenses.

Two years later, with the goal of expanding his business, he took another loan, sold some of his land in the village, and relocated his workshop to a larger space in the city. He began working with the help of electric machines. Success in his work was already evident, so after moving the workshop to the city, he started receiving numerous orders, and the pressure of work multiplied. Currently, his workshop employs seven workers. Business has flourished, and prosperity has reached his family. Within three years, he managed to repay all the loans. All of this became possible due to uninterrupted access to electricity, which met the demand.

He is very grateful to the Bangladesh Government for uninterrupted electricity, which led to open the door of fortune.


SECTION 9: OBSERVATIONS AND RECOMMENDATIONS OF THE SURVEY

9.1 Observations

The customers of different enumeration areas of BPDB, BREB, DESCO, DPDC, NESCO and WZPDCL were freely expressed their views for making the customer satisfaction survey in power sector more useful, effective and beneficial to all. These customer's satisfaction was considered quite germane to the electricity distribution entities in their areas, but found to be inadequate and insufficient to take care of all local needs of electricity. Some of the major observations of the survey are stated below.

Taking into consideration the increasing demand of the customers, the Costumer Service Centre needs to be more modernised by reshaping it as a self-sufficient one-stop digital service centre (24/7) with well-equipped communication facilities. This will positively help to resolve the complaints within a minimum time with more satisfied approach. It is observed that more enthusiastic, responsive and technically trained, well qualified human resources need to be appointed at the customer service centre immediately. It is also observed that most of the logistics are not in a good condition which are used by the Service Team (Line Gang). Hence, adequate modern and updated logistics need to be allocated considering the level of requirement and calculated workload.

Now a days, in Bangladesh using of private airlines, helicopters, water buses, yachts and steamer are gradually increasing. These vehicles cross over or passing under the high voltage electric lines, which is creating unwanted threats for the vehicles and the lives of the peoples/passengers due to lack of visibility of the High voltage electrical wire. The installation of the visibility marker balls (or just marker balls of "fluorescent aviation orange, yellow and red") on a high voltage wire could prevent the most severe accidents and loss of lives in the sky, over the mountain passes, deep valleys, major freeway crossings, and the rivers.

Though the bill payment mechanism is improving than before, still the customers are suffering during paying their monthly electricity bill specially for the post-paid meter. Hence, payment mechanism needs to make easier for customers by setting more bill payment booths and options. But the Online billing system is currently very modern and transparent, which is better than before and the customer able to pay from home. If any correction is needed in electricity bill, fast correction measure shall be established which will delete the disappointments of the customers. It is observed that customers expect tariff should be adjusted with the changing of fuel price and it should be within the capacity of the common people. Immediately convert the post-paid meter

to pre-paid meter and install the pre-paid meter at the areas of six utilities to ensure hassle free service to the customers which ultimately uphold the satisfaction level of the customers and augment the revenue generation.

Steps need to be taken to ensure that Annual Clearance Certificate is provided on a yearly basis and on time, which will keep the amicable relationship between customers and the utilities department. Annual Clearance certificate should be uploaded by the utilities in their respective website so that the customers can download the certificate in time of their need. Customers wanted sufficient power generation to reduce the load shedding to a minimum level to diminish their sufferings. Government should pay full attention in this regard. Actually, major load shedding is occurred due to shortage of power supply from the national grid. Attention needs to be given to minimize this problem. Customers urged to provide good quality batteries with a pre-paid meter. The prime expectation of the customer is uninterrupted power supply. Earlier load shedding was 10-12 times, but now load shedding is 1-2 times a day in the hot season and no-load shedding in winter. Due to shortage of manpower, Distribution Organizations/ Companies are unable to provide service on time. Skilled and technical manpower needs to increase for better customer service.

To provide better customer service concerned utility officials should be trained properly on the procedure of SAIDI/SAIDI/CAIDI to improve the SAIDI/SAIDI/CAIDI index. Local and Foreign Training may be considered for improving their work performance for serving the customer in a better way.

It is clearly noticed from the survey findings that pilferage/wastage of electricity reduced greatly and the situation in this regard improving very faster than the past. This is bringing positive change in the power distribution sector. But still the distribution system needs rehabilitation and augmentation to reduce interruption due to transformer, feeder and substation overloading. Survey findings unveil that customer awareness campaign needs to be carried through easy communication vehicles to make the customers aware about energy savings, energy conservation and also a limitation of the utilities. Quality of customer service is highly satisfactory and updated than past. To provide quality and faster service, arrange a monitoring meeting on a regular basis to build strong relationship with customers. Information about maintenance and outage schedule through miking, messaging, social media notifications and SMS for customer awareness. Replace the overhead bare, hazardous and risky electrical lines by insulated electric lines to make it safe. Due to road digging and construction work, the underground power supply line is disconnected and the utility customers are suffering. It needs to be done in coordination with the power distribution Organization/ Company. It is truly discovered from the analysis that the SAIDI and SAIFI of the six utilities are gradually improving in the FY 2019-2020 and FY 2020-2021 while the SAIDI and SAIFI value are increasing in the FY 2021-2022 and FY 2022-2023 (till March 2023). But these are within the range of fixed target.

9.2 Recommendations

Considering the critical analysis of the total findings the following recommendation may be considered by the Power Cell for the development of services of six utilities:

1) **Training:** Appropriate training is the vehicle of human resource development. After fixing the selection criteria, six utilities may select their professionals for Technical and Customer Management Training in the relevant local and foreign institute.

2) **SAIDI/SAIFI:** For better understanding of SAIDI/SAIFI/CAIDI along with report writing on the same, Six utilities need to be taken steps to organize a series of training courses for developing their professionals. Six utilities may install fault indicator lamp on the overhead line to quick identify the fault and reduce the interruption time.

3) **Billing System:** It is unveiled from the research that customers are interested to pay their bill from home without facing any hassle. Six utilities may take action on the basis of the survey findings.

4) **Monitoring Team:** To provide quality and faster service, six utilities may arrange a monitoring meeting on a regular basis to build strong relationship with customers. They will ensure that, the information about maintenance and outage schedule should be disseminate through miking, messaging, social media notifications and SMS for in-depth customer awareness.

5) **Customer Service Center (24/7):** Considering the increasing demand of the customers, six utilities may take action to create a modernized Costumer Service Centre by reshaping it as a self-sufficient one-stop digital service centre (24/7) with well-equipped communication facilities.

6) **Marker Ball:** The installation of the visibility marker balls (or just marker balls of "fluorescent aviation orange, yellow and red") on a high voltage wire could prevent the most severe accidents and loss of lives in the sky, over the mountain passes, deep valleys, major freeway crossings, and the rivers.

7) **Underground Cable Line:** HDD[32] machine should be used to install the underground cable line instead of open digging system. Six utilities may replace the overhead bare, hazardous and risky electrical lines by insulated electric lines to make it safe.

8) **Customer Awareness:** Six utilities may take proper action to ensure quality and faster service through monthly awareness meeting with their customers to build a

[32] Horizontal Directional Drilling (HDD)

strong relationship. They should use popular electronic and print media along with social media to disseminate the emergency information to their customers.

9) **Adequate Modern and Updated Logistics:** It is observed that most of the logistics are not in a good condition which are currently use by the Service Team (Line Gang). Six utilities may prepare an action plan to procure adequate modern and updated logistics considering the level of requirement and calculated workload.

10) **Multi-tier Baseline Survey:** To know the in-depth Pros & Cons of customer satisfaction level the Power Cell authority may consider arranging multi-tier baseline survey.

9.3 Conclusion

The assignment was undertaken by the Power Cell, Ministry of Power, Energy & Mineral Resources for conducting customer satisfaction survey including SAIDI/SAIFI in power sector under BPDB, BREB, DPDC, DESCO, NESCO and WZPDCL, and scanning the conditions of utilities and their customers. Useful information and data concerning utility services, implementing authorities and beneficiaries have been generated through this assignment.

On the basis of the findings documented in the report, the need for undertaking comprehensive support measures through projects separately for moving the wheel of fortune of the customers irrespective the classification has been assessed.

The customers who are living in these utility areas are not having an equal opportunity. The root of the problem between the rural and the urban settlers lies in unequal economic opportunities. The rural people in electricity distribution zone have less facilities and opportunities than the urban people who are living in outage free zones in Bangladesh.

At present, customers’ satisfactions have been a universally accepted and committed goal for any development initiative. And it has also been recognized as one of the crosscutting themes for all sectors and levels of interventions, as it encompasses all the sectors, stages and strata in the development regime. Therefore, conceptual clarity, internalization and development of new tools to reduce outage and customer’s perspectives of all categories are very necessary.

Hence, to achieve optimum customer satisfaction at urban and rural areas, the utility needs to play more vibrant role in initiating and igniting innovative ideas and tools relevant to its context. To that end, the project components have to be revised and refined on a regular basis and it should be a mandatory activity of the institution. Therefore, to keep financial commitments for modernising existing facilities and budget for modern logistics needs to be sorted out with care following unbiased principles.

Although the generation of electricity is healthy, but still the power outage repeatedly happens due to overloading of commercial consumers are the worst affected in any adversity of electricity failure. Electricity plays a critical role not only in family life but also in key livelihood activities. Hence, considering both family and the enterprise’s concerns and needs with equal importance is the key to rebuilding lives and communities in the areas of entities.

An initiative needs to be taken to orient domestic, industry (small, medium and large) and commercial uses on management of electricity. Awareness campaign and meeting with customers on a regular basis will facilitate identifying the outcome of the

provided services, benefits and progress. Some of the steps for improved customer service are being implemented by the electricity distribution entities, which is really promising. It is hoped that the suggested observations will be implemented by electricity distribution entities in right earnest to ensure a more inclusive and effective response to their beneficial initiatives.

The Report of Customer Satisfaction Survey including SAIDI/SAIFI in Power Sector will help in building - trustworthy relationship between rural and urban customers, load management system and staff motivation to bring about more lasting changes within Utilities, which ultimately play a vibrant role in constructing digital to smart Bangladesh.

Final Report on
CUSTOMER SATISFACTION SURVEY
IN POWER SECTOR





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