

ANNUAL ENERGY AUDIT REPORT



Designated Consumer



**Meghalaya Power Distribution Corporation Limited
(MePDCL)**

Lum Jingshai, Short Round Road, East Khasi Hills
Shillong– 793001

(Meghalaya)

FY 2023 -24

Conducted by



A-Z Energy Engineers Private Limited

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List of Abbreviations

AMI	Advanced Metering Infrastructure
AMR	Automated Meter Reading
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
AT&C	Aggregate Technical and Commercial
BEE	Bureau of Energy Efficiency
ckt	Circuit
CT	Current Transformer
DC	Designated Consumer
DEEP	Discovery of Efficient Electricity Price
DISCOM	Electricity Distribution Company
DT	Distribution Transformer
EA	Energy Auditor
EHT	Extra High Tension
EHV	Extra High Voltage
EM	Energy Manager
FY	Financial Year
HT	High Tension
HVDS	High Voltage Distribution System
KVA	Kilo Volt Ampere
LT	Low Tension
MoP	Ministry of Power
MU	Million Units
MW	Mega Watt
NO	Nodal Officer
OA	Open Access
PoC	Point of Connection
PT	Potential Transformer
PX	Power Exchange
RE	Renewable Energy
RLDC	Regional Load Dispatch Centre
SDA	State Designated Agency
SLD	Single Line Diagram
SLDC	State Load Dispatch Centre
T&D	Transmission and Distribution

Acknowledgement

We would like to express our heartfelt gratitude to the Meghalaya Power Distribution Corporation Limited (MePDCL), Shillong for providing us with the opportunity to conduct the Energy Audit of their DISCOM for FY 2023-24, in accordance with the Bureau of Energy Efficiency (Manner and Intervals for Conduct of Energy Audit in electricity distribution companies) Regulations, 2021 and its Amendments.

We are immensely grateful to the management of Meghalaya Power Distribution Corporation Limited (MePDCL), Shillong, for their invaluable cooperation and providing us with all the relevant information necessary for the successful completion of the Annual Energy Audit.

We also extend our sincere thanks to the entire working group, especially to Sh. Sanjay Goyal- CMD, Sh. P. Sahkhar- Director (Distribution), SS Kharmih- Chief Engineer and Sh. Santanu Mandal- Energy Manager (EM), for their immense support and assistance throughout the audit process.

We look forward to a continued partnership with Meghalaya Power Distribution Corporation Limited (MePDCL), Shillong, and we express our gratitude for their continued support in all our future endeavours.



Signature

Name: Dr. P.P Mittal

Designation: Director

Registered No: AEA-011

Firm: A-Z Energy Engineers Pvt. Ltd.

1. Executive Summary

About The Meghalaya Power Distribution Corporation Limited

At present, the MePDCL is spread over an area of 22,000 sq. km that is divided into seven (7) power distribution circles, & 2 Distribution Franchisee namely West Garo Hills, East Garo Hills, Khasi Hills, Jaintia Hills, Ri-Bhoi, Shillong, and Tura. These distribution circles have been strategically divided to cover eleven (11) districts present within the state. After preliminary stakeholder interaction with utility officials of the respective circles, data collection was carried out to collect the data required for further study. Using the data collected, AT&C loss level computation was carried out. It was observed from our field survey that lack of metering, longer line lengths, malfeasance practices, and lack of database management were the key and preliminary factors behind the high losses.

In exercising the powers conferred to it under Section 131 and 133 of the Electricity Act 2003, the State Government of Meghalaya notified "The Meghalaya Power Sector Reforms Transfer Scheme 2010", notified on 31st March 2010. The Scheme paved path for the restructuring and unbundling of the erstwhile Meghalaya State Electricity Board (MeSEB). As per the provisions of the aforesaid transfer scheme MeSEB was un-bundled into four entities which are:

- Meghalaya Energy Corporation Limited (MeECL) which is the holding company;
- Meghalaya Power Distribution Corporation Limited (MePDCL) – Distribution Utility;
- Meghalaya Power Generation Corporation Limited (MePGCL)- Generation Utility;
- Meghalaya Power Transmission Corporation Limited (MePTCL)– Transmission Utility.

Meghalaya Power Distribution Corporation Limited is a Distribution Licensee in the State of Meghalaya and is vested with functions of the distribution licensee as outlined in the Electricity Act 2003. The Corporation serves around 6.9 Lakh consumers with a connected load of 1381 MW.

While the Input Energy purchase, Net Input energy at DISCOM Periphery and Energy billed for the customer is 2632.53 MU, 1769.42 MU and 1434.0 MU, the monthly consumption per customer stands at 173.037 KWH/Month. MePDCL caters to area spread in 7 circles, 17 Division.

1.1. Goals and Objectives

MePDCL is a designated consumer in Discom sector. Being a designated Consumer MePDCL need to have Annual energy audit (Accounting) of their facilities as per BEE notification No 18/1/BEE/Discom/2021 dated 6th October 2021.

The Annual Energy Audit (Accounting) at MePDCL is conducted with the following Objectives:

- Verification of existing pattern of energy distribution across periphery of electricity Distribution Company.
- Verification of accounted energy flow submitted by electricity Distribution Company at all applicable voltage levels of the distribution network.

- Verification of the accuracy of the data collected and analyses and processes the data with respect to consistency, improvement in accounting and reducing loss of DISCOM.
- Verification of the information submitted by DC to the SDA/BEE about status of energy input, Output and loss for the previous two year.
- Access the past performance of the establishment.
- Quantification of Energy Losses, and Energy Saving Potential.

1.2. About Energy Audit firm

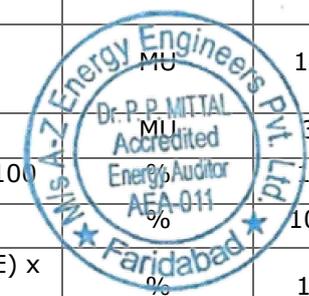
A-Z Energy Engineers Pvt. Ltd. is an Accredited Energy Auditor from BEE and an ISO 9001:2015 certified company that aims to assist all stakeholders in implementing energy efficiency and creating awareness about the merits of energy efficiency and safety practices. They are empanelled by BEE for PAT M & V Audits and Mandatory Energy Audit Projects and have completed more than 1732 projects, including 72 PAT projects. The founder Director, Shri. Dr PP Mittal, has received several awards and recognitions for his services in the field of energy. We have a pool of experienced BEE Accredited & Certified Energy Auditors, Electrical Engineers, Mechanical Engineers and Technicians having experience of more than 30 years. The Energy Audits is being carried out with sophisticated instruments namely Power-Analyzer, Flue Gas Analyzer, Ultra-sonic flow meter, Techo-meter, Anemometer, Hego-Meter, Digital Thermometer, Thermographic Camera's, Lux Meter, Leak detectors. Laser gun etc.

1.3. AT&C losses for FY 2023-24

Meghalaya Power Distribution Corporation Limited (MePDCL), is a state-owned electric utility company headquartered in Shillong, Meghalaya, India. Meghalaya Power Distribution Corporation Limited (MePDCL), distributes electricity from the end point of transmission to the end consumers. The AT&C loss for FY2023-24 is 17.29% & the Distribution loss of the sector is 18.96%. The AT&C loss for the FY 2023-24 are shown in the table below:

Table 1: Energy Balance & Losses for FY 2023-24

Energy Input Details	Formula	UoM	Value
Input Energy Purchase (From Generation Source)	A	MU	2632.53
Net input energy (at DISCOM Periphery after adjusting the transmission losses and energy traded)	B	MU	1769.42
Total Energy billed (is the Net energy billed, adjusted for energy traded))	C	MU	1434.00
Transmission and Distribution (T&D) loss Details	D	MU	335.43
	$E = D/B \times 100$	%	18.96%
Collection Efficiency	F	%	102.06%
Aggregate Technical & Commercial Loss	$G = 1 - \{(1-E) \times \text{Min}(F, 100\%)\}$	%	17.29%



2. Background

2.1. Extant Regulations and role of BEE

2.1.1. The Objectives of BEE

- To develop policies and programmes on efficient use of energy and its conservation with the involvement of stakeholders.
- To plan, manage and implement energy conservation programmes as envisaged in the EC Act.
- To assume leadership and provide policy framework and direction to national energy efficiency and conservation efforts and programmes.
- To demonstrate energy efficiency delivery mechanisms, as envisaged in the EC Act, through Public-Private Partnership (PPP).
- To establish systems and procedures to measure, monitor and verify energy efficiency results in individual sectors as well as at the national level.
- To leverage multi-lateral, bi-lateral and private sector support in implementation of programmes and projects on efficient use of energy and its conservation.
- To promote awareness of energy savings and energy conservation.

2.1.2. Role of BEE

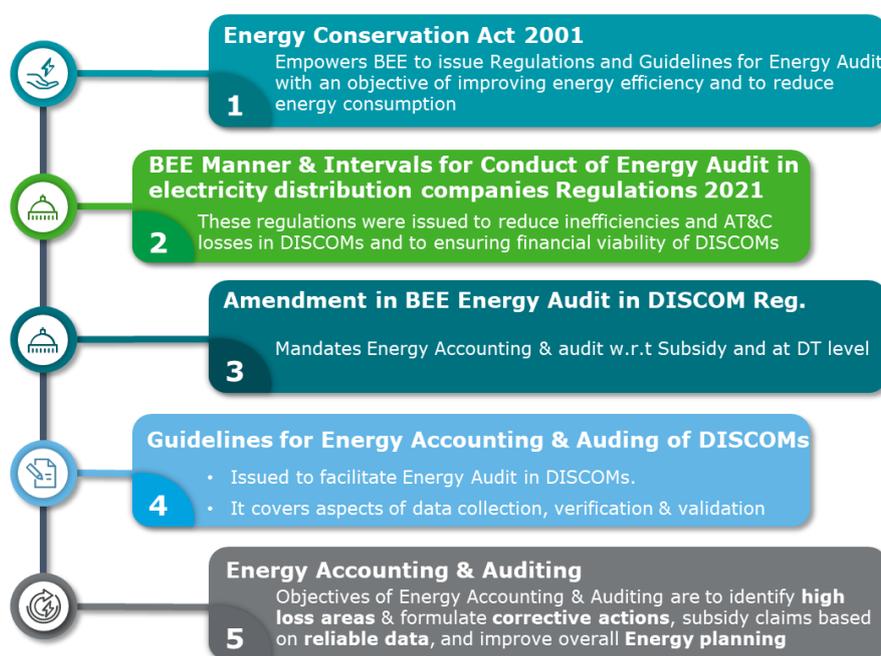
- BEE coordinates with designated agencies, designated consumers and other organization working in the field of energy conservation/efficiency to recognize and utilize the existing resources and infrastructure in performing the functions assigned to the Bureau under the Energy Conservation Act.
- The Act provides regulatory mandate for: standards & labeling of equipment and appliances; energy conservation building code for commercial buildings; and energy consumption norms for energy intensive industries.
- The EC Act was amended in 2010 to incorporate few additional provisions required to better equip BEE to manage ever evolving sphere of energy efficiency in the country.
- Create awareness and disseminate information on energy efficiency and conservation.
- Arrange and organize training of personnel and specialists in the techniques for efficient use of energy and its conservation.
- Strengthen consultancy services in the field of Energy Efficiency.
- Promote research and development.
- Develop testing and certification procedures and promote testing facilities.
- Formulate and facilitate implementation of pilot projects and demonstration projects.
- Promote use of energy efficient processes, equipment, devices and systems.
- Take steps to encourage preferential treatment for use of energy efficient equipment or appliances.
- Promote innovative financing of energy efficiency projects.

- Give financial assistance to institutions for promoting efficient use of energy and its conservation.
- Prepare educational curriculum on efficient use of energy and its conservation.
- Implement international co-operation programmes relating to efficient use of energy and its conservation.

2.1.3. Regulatory framework for Energy Accounting & Audit

The Energy Conservation Act 2001 (hereafter referred to as EC Act 2001) was enacted on 29th September 2001. The EC Act 2001 empowers BEE to notify regulations regarding energy conservation and efficiency improvement. In accordance with the EC Act 2001, BEE notified the Bureau of Energy Efficiency (Manner and Intervals for Conduct of Energy Audit) Regulations, 2021, on 6th October 2021. BEE subsequently amended these regulations with the Bureau of Energy Efficiency (Manner and Intervals for Conduct of Energy Audit) (Amendment) Regulations, 2022. The Ministry of Power (MoP) issued guidelines on 17th January 2023, for energy accounting and auditing of distribution companies, in line with the BEE regulations. Distribution companies and energy audit firms must comply with this regulatory framework when preparing energy accounts and audit reports. The regulatory framework for Energy accounting and Energy Auditing is shown in the below figure:

Figure 1: Regulatory framework for Energy Accounting & Audit



Key highlights of the Regulatory framework are listed below:

- Bureau of Energy Efficiency (BEE) through Ministry of Power, Government of India issued regulations for Conduct of Mandatory Annual Energy Audit and Periodic Energy Accounting in DISCOMs. As per the regulation, all Electricity Distribution Companies

are mandated to conduct annual energy audit and periodic energy accounting on quarterly basis.

- Owing to the impact of energy auditing on the entire distribution and retail supply business and absence of an existing framework with dedicated focus on the same, it was imperative to develop a set of comprehensive guidelines that all Distribution utilities across India can follow and adhere to.
- Accordingly, Regulations on Manner and Intervals for Conduct of Energy Audit and Accounting in Electricity Distribution Companies has been framed. Energy Accounting means accounting of all energy inflows at various voltage levels in the distribution periphery of the network, including renewable energy generation and open access consumers, and energy consumption by the end consumers. Energy accounting and a consequent annual energy audit would help to identify areas of high loss and pilferage, and thereafter focus efforts to take corrective action.
- These Regulations for Energy audit in Electricity Distribution Companies provides broad framework for conduct of Annual Energy Audit though and Quarterly Periodic Energy Accounting with necessary Pre-requisites and reporting requirements to be met.
- The Central Government may issue the energy savings certificate to the designated consumer whose energy consumption is less than the prescribed norms and standards in accordance with the procedure as may be prescribed.
- The designated consumer whose energy consumption is more than the prescribed norms and standards shall be entitled to purchase the energy savings certificate to comply with the prescribed norms and standards
- The Central Government may, in consultation with the Bureau, prescribe the value of per metric ton of oil equivalent of energy consumed

2.2. Purpose of audit and accounting Report

MePDCL is a designated consumer in Discom sector. Being a designated Consumer MePDCL need to have Annual energy audit (Accounting) of their facilities as per BEE notification No 18/1/BEE/Discom/2021 dated 6th October 2021.

The energy intensity of India is higher with respect to GDP growth and there is an urgent need to address these issues on priority through integrated and comprehensive approach and by adopting latest techniques and technologies with active participation of all stakeholders.

Sensing the need of the hour Government of India initiated a mechanism for all energy intensive large industries and facilities (designated consumer) known as PAT Scheme which is "A market-based mechanism to enhance cost effectiveness of improvements in energy efficiency in designated consumers, through certification of energy savings that could be traded."

Annual Energy audit (Accounting) will not only help in reducing losses in system, but it also helps DISCOM in sustainable growth. The objective of this energy audit is to reduce T&D

loss and AT&C loss of the DISCOM through identification of commercially viable and implementable scheme for reduction of technical and commercial loss in the DISCOM thus leading to sustainable energy cost reductions.

The Annual Energy Audit (Accounting) at MePDCL is conducted with the following Objectives:

- Verification of existing pattern of energy distribution across periphery of electricity Distribution Company.
- Verification of accounted energy flow submitted by electricity Distribution Company at all applicable voltage levels of the distribution network.
- Verification of the accuracy of the data collected and analyses and processes the data with respect to consistency, improvement in accounting and reducing loss of DISCOM.
- Verification of the information submitted by DC to the SDA/BEE about status of energy input, Output and loss for the previous two year.
- Access the past performance of the establishment.
- Quantification of Energy Losses, and Energy Saving Potential.

2.3. Period of Energy Auditing and accounting

Energy audit activity was started with a meeting at Head Office of MePDCL in the month of June. 2024. Based on the requirement visit was made to Division, Subdivision, Grid & Substation etc. for data collection and technical discussion. The period of study was from April 2023 to March 2024. The quarter wise report has been updated as per the DF consumers.

Table 2: Period of Energy Auditing and accounting

Particulars	Energy Accounting				Energy Audit
	Q1	Q2	Q3	Q4	FY 2023-2
Applicable period	1-Apr-23 to 30-Jun-23	1-Jul-23 to 30-Sep-23	1-Oct-23 to 31-Dec-23	1-Jan-24 to 31-Mar-24	1-Apr-23 to 31-Mar-24
Date of Commencement	29-Sept-2023	30- Nov-2023	15-Feb-2024	15-May-2024	
Date of Publishing	29-Sept-2023	30- Nov-2023	15-Feb-2024	15-May-2024	
Officer In charge	Shri. S.S. Kharmih (Chief Engineer (Comm.) i/c)				Dr. P P Mittal [AEA 0011] Registration No: EmAEA-0024



[Handwritten signature]

3. DISCOM Introduction and Overview

3.1. Name and address of DISCOM

MePDCL (Meghalaya Power Distribution Corporation Limited) is having its corporate office at Lum Jingshai, Short Round Road, Shillong- 793001 (Meghalaya)

Table 3: Name and Address of DISCOM

Particulars	Details
Name of DC	Meghalaya Power Distribution Corporation Limited
Address	Lum Jingshai, Short Round Road, Shillong- 793001 (Meghalaya)

3.2. Name and contact details of energy manager (BEE Certified, if any) and Authorized signatory of DISCOM (Nodal Officer)

The Energy Accounting/Audit wing is headed by Mr. SS Kharmih (Chief Engineer-Comm.) and Mr. Santanu Mandal (EM) is a BEE certified Energy Manager is leading the energy accounting activities in MePDCL. The details of DISCOM's energy manager and authorized signatory for this report are shown below:

Table 4: Details of energy manager and Authorized signatory of DISCOM

Particulars	Details
Energy Manager	Shri. Santanu Mandal Energy Manager EA-23306 Mobile: 9851628686 Email: cem.meecl@gmail.com
Authorized Signatory	Shri. SS Kharmih Chief Engineer (Comm) Mobile: 9863074990 Email: cemoneva.meecl@gmail.com

3.3. Summary profile of DISCOM

3.3.1. Jurisdiction of DISCOM

The Meghalaya Energy Corporation Ltd. (MeECL) is a Government Company within the meaning of section 45 of the Companies Act, 2013, wholly owned by the Government of Meghalaya, incorporated under the Companies Act, 2013 in the year 2009 and inherited its business from the erstwhile Meghalaya State Electricity Board (MeSEB) in the year 2010. It has wholly owned three subsidiary Companies namely, Meghalaya Power Generation Corporation Ltd. (MePGCL), Meghalaya Power Transmission Corporation Ltd. (MePTCL) and Meghalaya Power Distribution Corporation Ltd. (MePDCL) responsible for Generation, Transmission and Distribution of Electricity respectively throughout the State as State Utilities.

The erstwhile Meghalaya State Electricity Board (MeSEB) was formed in the year 1975 after the formation of new State of Meghalaya from undivided State of Assam. The first Hydro Electric project in Meghalaya had started its operation in the year 1921, thereafter different Hydro Electric projects are being constructed throughout the State of Meghalaya utilising the natural water resources, efficient and experienced engineering wing and beautiful working environment of the State. MePDCL caters to area spread in 7 circles, 17 Division.

3.3.2. Energy Accounting/Audit wing in the DISCOM:

The Energy Accounting/Audit cell in the DISCOM has been established on 16-06-22. The Organogram of the DISCOM is as shown below:

Figure 2: Organogram of Energy accounting cell in the DISCOM

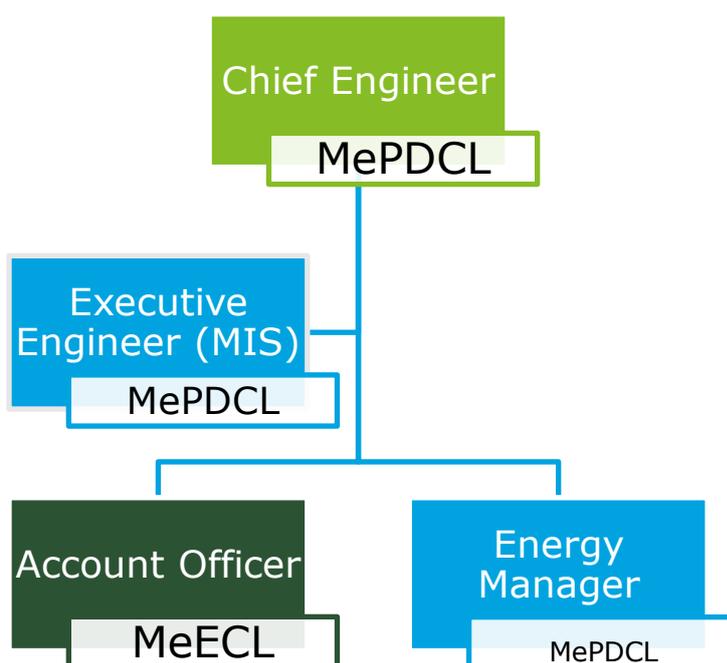


Table 5: Details of energy manager and Authorized signatory of DISCOM

Designation	Name of Officers
Director (Distribution)	Shri. P.Sahkhar
Chief Engineer Commercial	Shri. SS Kharmih
Executive Engineer (MIS)	Smti. S. Rymbai
Accounts Officer	Shri. A. Myllemngap
Energy Manager	Shri. S. Mandal

3.3.3. Administrative hierarchy

MePDCL is having its corporate office at Lum Jingshai, Short Round Road, Shillong, Meghalaya and has 7 Circles. These Circles are further divided into Divisions, Sub-Divisions and Sections as shown in the below tables.

Table 6: Administrative hierarchy structure in MePDCL

Parameters	Total
Number of circles	7
Number of divisions	17
Number of sub-divisions	54

The Circles are further divided into Divisions, Sub-Divisions and Sections as shown in the table below:

Table 7: Administrative hierarchy in MePDCL upto section level

Sub-Zone	Circle	Division	Sub-division
Addl. Chief Engineer	Superintendent Engineer	Executive Engineer	Asst. Executive Engineer
Central Zone	Shillong Distribution Circle	Shillong (East) Distribution Division	Nongthymmai DSD
			Lapalang DSD
			New Shillong DSD
		Shillong (West) Distribution Division	Mawlai DSD
			Upper Shillong DSD
			Umlyngka DSD
		Shillong Central Distribution Division	Umjarain DSD
			Central DSD
			Polo DSD
	Mawprem DSD		
	Khasi Hills Distribution Circle	East Khasi Hills Distribution Division	Mawryngkneng DSD
			Pynursla DSD
			Cherra DSD
			Sohiong DSD
		West Khasi Hills Distribution Division	Mairang DSD
			Nongstoin DSD
Riangdo DSD			
South Khasi Hills Distribution Division		Mawkyrwat DSD	
		Mawsynram DSD_DF	
Eastern Zone	Ri-Bhoi Distribution Circle	Umiam Distribution Division	Umiam DSD
			Umsning DSD
			Umiam Rural DSD

Sub-Zone	Circle	Division	Sub-division
		Nongpoh Distribution Division	Nongpoh DSD
			Nongpoh Rural DSD
			Patharkmah DSD
		Byrnihat Distribution Division	Byrnihat DSD-I
			Killing DSD
			Byrnihat DSD-II
	Jaintia Hills Distribution Circle	Khliehriat Distribution Division	Sutnga DSD
			Khliehriat DSD
		Jowai Distribution Division	Jowai DSD
			Amlarem DSD
		Jowai Rural Distribution Division	Shangpung DSD
			Khliehtyrshi DSD
Western Zone	Tura Distribution Circle	Tura Distribution Division	Tura (West) DSD
			Tura (East) DSD
			Tura (North) DSD
	East Garo Hills Distribution Circle	South Garo Hills Distribution Division	Baghmara DSD
			Nangalbibra DSD_DF
			Chokpot DSD
		East Garo Hills Distribution Division	Williamnagar DSD
			Mendipathar DSD
			Bajengdoba DSD
			Songsak DSD (non-functional)
			Kharkutta DSD

Sub-Zone	Circle	Division	Sub-division
	West Garo Hills Circle	West Garo Hills Distribution Division	Dalu DSD_DF
			Dadengre DSD
			Tikrikilla DSD (non-functional)
			Phulbari DSD_DF
		South-West Garo Hills Distribution Division	Selsella DSD
			Garobadha DSD
			Ampati DSD
			Mahendraganj DSD

3.3.4. Consumer Details

Energy consumption with type of customer is given in the table:

Table 8: Customer Profile for FY 2023-24

Category	No. of Connections		Connected Load		Energy		Billed Amount in Rs. Crore	Collected Amount in Rs. Crore
	Nos	%	MW	%	MU	%		
Residential	648928	94%	828.52	60%	600.71	42%	345.35	332.04
Agricultural	23	0%	0.22	0%	0.202	0%	0.08	0.12
Commercial/ Industrial-LT	37815	5%	136.85	10%	93.69	7%	86.83	89.30
Commercial/ Industrial-HT	438	0%	321.83	23%	630.20	44%	463.38	444.45
Others	3394	0%	94.16	7%	109.19	8%	98.41	148.60
Total	690598	100%	1381.58	100%	1433.996	100%	994.06	1014.51

3.4. Electrical infrastructure and assets voltage wise

The following table provides the details of network infrastructure owned by MePDCL:

Table 9: Network Infrastructure details

Asset	Particulars	Unit	FY21-22	FY22-23	FY 23-24
66 kV and above	66/ 11 kV Sub station	Nos			
	66 kV Feeders	Nos			
	66 kV Line	Ckt. Km			
33 kV	33/ 11 kV Sub station	Nos		116	127
	33 kV Feeders	Nos		184	203
	33 kV Line	Ckt. Km		2685.155	2797.4
11 kV	11 kV Feeders	Nos	367	367	368

Asset	Particulars	Unit	FY21-22	FY22-23	FY 23-24
	11 kV Overhead Line	Ckt. Km	19683.13	19715.32	17697.98
	11 kV Underground Line	Ckt. Km	1.86	1.86	1.86
LT	LT Line	Ckt. Km	31756.52	31603.472	29384.128
PTR	Power Transformer	Nos			
	Power Transformer Capacity	MVA			
DTR	Distribution Transformer	Nos	12853	13137	13477
	Distribution Transformer Capacity	KVA		832896.5	841923.3

The Input energy, consumption, transmission losses and key infrastructure details of the MePDCL are summarized in table below:

Table 10: Input Energy & Infrastructure details

Parameters	FY 2023-24
Input Energy purchased (MU)	2632.535
Transmission loss (%)	4%
Transmission loss (MU)	101.91
Energy sold outside the periphery (MU)	761.203
Open access sale (MU)	0
EHT sale	0
Net input energy (received at DISCOM periphery or at distribution point)-(MU)	1769.42
Is 100% metering available at 66/33 kV (Select yes or no from list)	No
Is 100% metering available at 11 kV (Select yes or no from list)	No
% of metering available at DT	29%
% of metering available at consumer end	97%
No of feeders at 66kV voltage level	11
No of feeders at 33kV voltage level	181
No of feeders at 11kV voltage level	345
No of LT feeders' level	NA
Line length (ckt. km) at 66kV voltage level	NA
Line length (ckt. km) at 33kV voltage level	2797.4
Line length (ckt. km) at 11kV voltage level	17697.98
Line length (km) at LT level	29384.128
Length of Aerial Bunched Cables	0
Length of Underground Cables	1.86
HT/LT ratio	0.6975

3.4.1. Metering details

The status of meters installed in MePDCL as on 31-03-2024 are given in the below tables:

Table 11: Voltage wise Meter Consumers

Parameters	>66kV	33kV	11/22kV	LT
Number of conventional metered consumers	11	88	627	562679
Number of consumers with 'smart' meters			106	93922
Number of consumers with 'smart prepaid' meters			0	0
Number of consumers with 'AMR' meters			0	0
Number of consumers with 'non-smart prepaid' meters	0	0	0	14131
Number of unmetered consumers				19034
Number of total consumers	11	88	733	689766

3.4.2. Distribution Transformer (DT) details

The details of distribution transformers in MePDCL as on 31-03-2024 are given in the below tables:

Table 12: Numbers of Distribution Transformers

Parameters	>66kV	33kV	11/22kV	LT
Number of conventionally metered Distribution Transformers			3958	
Number of DTs with communicable meters			0	
Number of unmetered DTs			9519	
Number of total Transformers	36	164	13477	

3.4.3. Feeder details

The details of feeders in MePDCL as on 31-03-2024 are given in the below tables:

Table 13: Voltage wise numbers of Feeders

Parameters	>66kV	33kV	11/22kV	LT
Number of metered feeders	11	93	293	
Number of feeders with communicable meters	0	0	0	
Number of unmetered feeders		88	52	
Number of total feeders	11	181	345	

3.4.4. Distribution Line details

The details of distribution lines in MePDCL as on 31-03-2024 are given in the below tables:

Table 14: Length of Distribution Lines

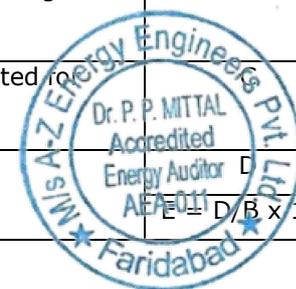
Particulars	Value(km)
Line length(ctkm)	29384.128 (LT line)+ 17697.98 (11 kV line)+ 2797.40 (33kV line)
Length of Aerial Bunched Cables	0
Length of Underground Cables	1.86

3.4.5. Energy Flow details

Energy flow details for FY 2023-24 are given in the below table:

Table 15: Energy Flow details

EnergyInput Details	Formula	UoM	Value
Input Energy Purchase (From Generation Source)	A	MU	2632.53
Net input energy (at DISCOM Periphery after adjusting the transmission losses and energy traded)	B	MU	1769.42
Total Energy billed (is the Net energy billed, adjusted for energy traded)		MU	1434.00
Transmission and Distribution (T&D) loss Details		MU	335.43
	$\frac{E - D}{B} \times 100$	%	18.96%

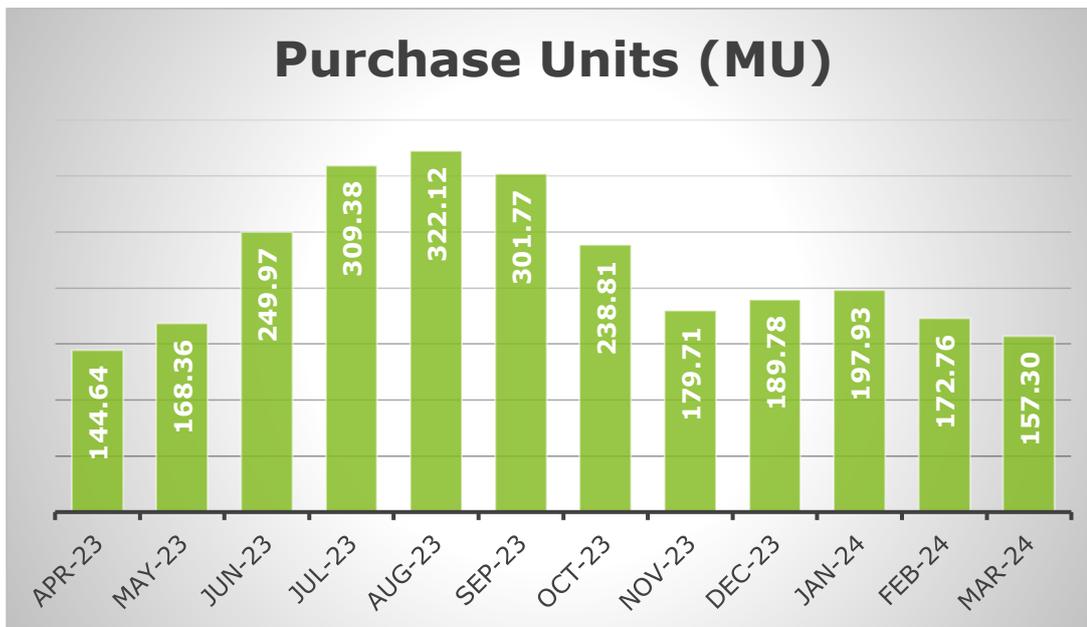


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3.4.6. Pattern of energy distribution

Power Purchase:

During the analyzed period, MePDCL purchased a maximum energy of 322.12 million units (MUs) in August 2023, while the least energy of 144.64 MUs was purchased in April 2023. This shows that the company's energy purchase varies considerably from month to month irrespective of the seasonal impact.



Energy Billed:

The energy billed by MePDCL showed a minor increasing trend from April 2023 to March 2024, with a slight bump in October 2023. This indicates that the company's energy consumption has increased gradually over the analyzed period.

The chart below shows MePDCL energy purchase pattern from April 2023 to March 2024:

Figure 3: Monthly Energy Input and Energy billed pattern

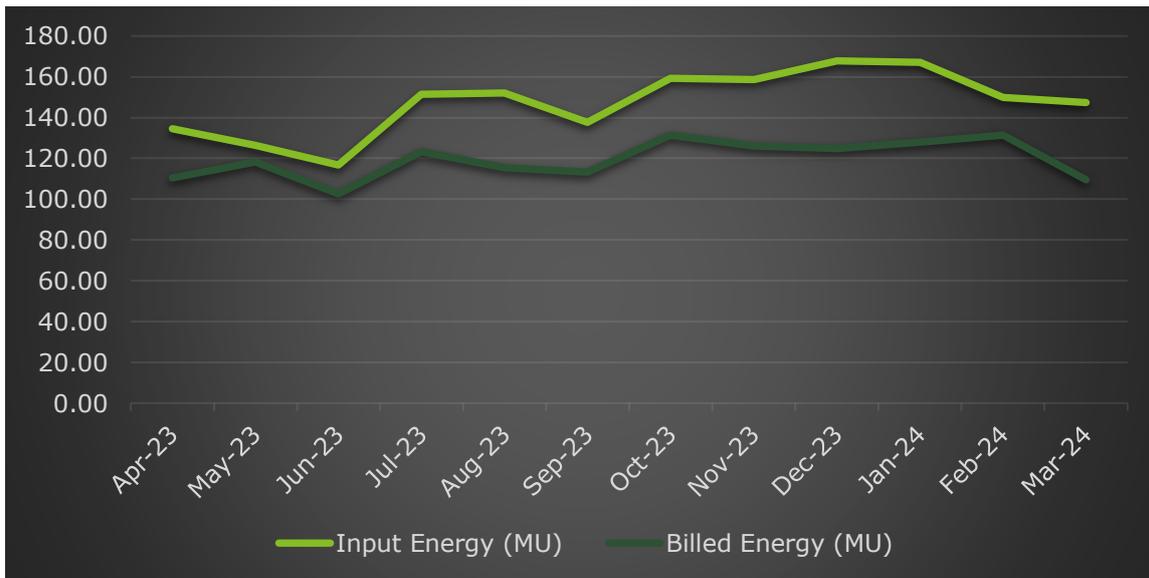
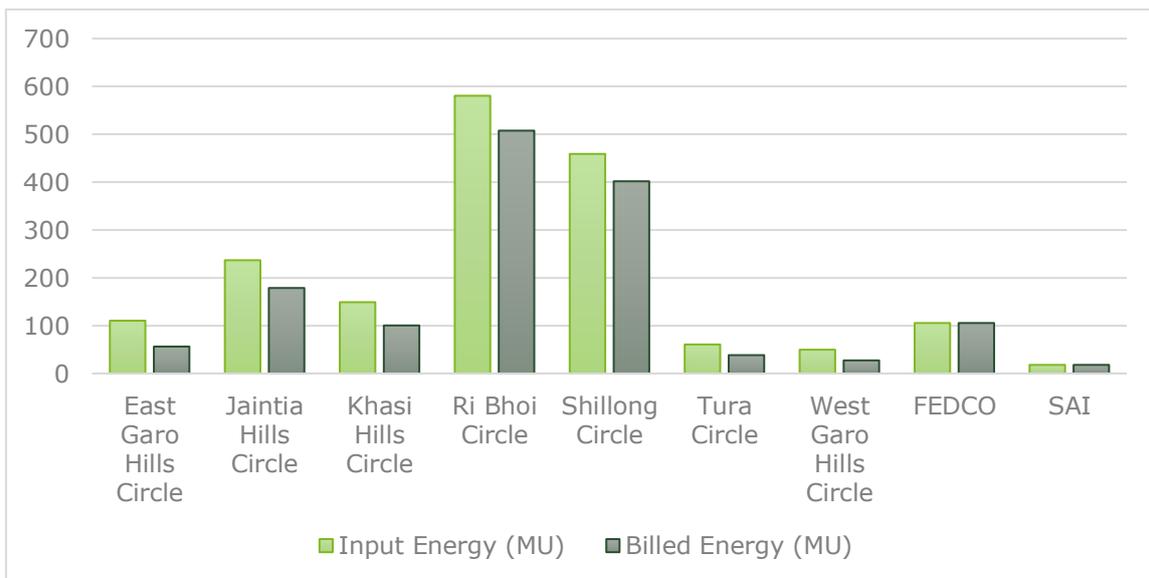


Figure 4: Circle wise Energy Input (MU) and Energy billed (MU) pattern



In conclusion, MePDCL energy purchase pattern shows considerable variation from month to month. While the maximum energy was purchased in August 2023, the least energy was purchased in April 2023. The energy billed shows a minor increasing trend from April 2023 to March 2024, indicating a gradual increase in energy consumption. The chart shows that the energy purchase pattern fluctuates considerably, which may pose challenges for the company in managing its energy supply and demand.

The Month wise break up of input energy (MUs) parameter for all the circle is given below:

Table 16: Month wise Input Energy for FY 2023-24

Particulars	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
East Garo	8.62	5.86	6.53	9.34	10.66	9.67	10.45	9.31	10.59	11.51	9.14	8.66
Jaintia	22.32	17.68	17.94	23.52	22.81	18.72	20.39	18.17	20.75	19.94	17.52	17.02
Khasi Hills	9.05	8.51	8.56	11.14	12.26	11.32	12.83	13.79	15.72	16.63	14.65	14.58
Ri-Bhoi	48.10	49.23	39.69	54.27	50.30	44.33	58.25	57.17	51.53	45.05	39.24	43.35
Shillong Circle	30.26	30.74	29.97	32.68	33.63	32.19	36.30	40.84	48.05	51.38	48.65	44.26
Tura	4.29	4.29	4.41	5.39	5.70	5.74	5.42	4.78	5.63	6.19	4.67	4.14
West Garo	3.48	3.00	2.97	4.82	4.87	4.19	4.92	3.94	3.72	4.71	4.36	4.71
FEDCO	7.20	6.01	5.58	8.61	10.07	10.12	9.18	9.19	10.06	10.01	10.33	9.15
SAI	1.29	1.05	1.11	1.68	1.74	1.50	1.64	1.52	1.77	1.81	1.45	1.43
Grand Total	134.60	126.37	116.76	151.45	152.02	137.78	159.37	158.70	167.83	167.22	150.01	147.31

The Month wise break up of billed energy (MUs) parameter for all the circle is given below:

Table 17: Month wise Billed Energy for FY 2023-24

Particulars	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
East Garo Hills Circle	4.768	3.827	3.403	3.940	4.840	4.695	5.680	5.126	4.675	5.179	5.441	4.716
Jaintia Hills Circle	23.200	19.059	15.911	19.713	16.982	13.293	14.702	11.698	10.920	11.653	11.047	10.537
Khasi Hills Circle	7.776	7.081	6.782	7.502	8.117	7.914	8.277	9.271	8.965	10.068	9.694	8.996
Ri Bhoi Circle	30.185	49.131	36.158	48.152	38.284	40.419	53.818	49.594	46.025	40.755	42.317	32.771
Shillong Circle	30.452	27.422	28.577	28.967	29.695	29.406	31.656	33.803	37.642	42.647	44.676	36.818
Tura Circle	3.290	2.929	3.167	2.767	3.201	3.360	3.507	2.968	2.637	3.524	3.903	3.107
West Garo Hills Circle	2.190	1.846	1.918	1.887	2.508	2.566	2.922	2.821	2.004	2.276	2.498	1.912
FEDCO	7.205	6.006	5.582	8.612	10.065	10.117	9.175	9.187	10.059	10.009	10.326	9.152
SAI	1.286	1.053	1.108	1.677	1.736	1.502	1.636	1.516	1.775	1.808	1.447	1.430
Grand Total	110.352	118.354	102.606	123.217	115.429	113.272	131.374	125.983	124.702	127.919	131.348	109.439

The voltage wise consumption pattern is given below:

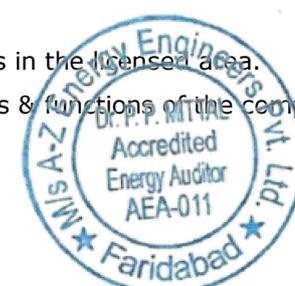
Table 18: Voltage wise consumption pattern

Voltage Level	Consumers		Energy Consumption	
	No.	%Share	Mus	%Share
LT	35253	5.10%	101.55	7.08%
HT/EHT	514	0.07%	611.051	42.61%
LT/HT	654831	94.82%	721.395	50.31%
Total	690598	100.00%	1433.996	100.00%

3.4.7. Salient features

MePDCL main objectives are to achieve efficiency gains and make necessary changes to make the company commercially viable, progressively self-sustainable, and less dependent on the government while balancing the interests of consumers with regards to quality of service and economical tariffs.

- To undertake the activities of distribution to all consumers irrespective of the voltage, provision, supply, wheeling, purchase, sale, import, export and trading of electricity, introduce open access in distribution as per the Electricity Act 2003 and/or the directions of the regulator.
- To plan, develop, acquire, establish, construct, erect, lay, hire, lease, buy, sell, operate, run, manage, maintain, enlarge, alter, renovate, modernize, work and use power distribution system network in all its aspects including amongst others various voltage lines and associated sub -stations, including distribution centers, cables, wires, accumulators, plants, motors, meters, apparatus, computers and materials connected with sub -transmission, distribution, supply of electrical energy, ancillary services, telecommunication and telemetering equipments.
- To tender, finalise and execute Power Purchase Agreements and other agreements for sale or purchase of electricity with generating companies, trading companies, other distribution companies, Central and State generating authorities, departments or companies, societies, other States, utilities, Independent Power Producers and other Persons.
- To undertake Rural Electrification schemes in the licensed area.
- Any other work incidental to the objectives & functions of the company.



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3.5. Energy Conservation measures

Energy conservation is a critical issue in today's world, as the demand for energy continues to increase while the resources available to produce it are finite. The energy conservation measures that have already been taken and propose some measures for the future are explained below.

Energy Conservation Measures taken by the DISCOM:

Several energy conservation measures have already been implemented to reduce energy consumption and promote sustainable energy use. Some of these measures are:

1. MePDCL has reduced their AT & C losses quite appreciably from the FY 2011-12 to FY 2022-23 by the adoption of Technical Loss Management by network up-gradation, installation of power factor controller, network management, regular health monitoring of the assets at all voltage levels, High Voltage Distribution System (HVDS) installation, LED bulb distribution, Commercial Loss Management and Theft Control, conducting in house Energy audit, replacement of old meters with high quality electronic meters, adoption of Automatic Meter Reading System, Smart Street Lighting Management System, LT Aerial Bunched Conductor (ABC) installation, use different types of seals to prevent unauthorized access to service parts etc.
2. Management response for action plan of MePDCL was found to be very positive and MePDCL was agreed upon to implement it with top priority within the target stipulated in pre-requisites of BEE's regulation.
3. Energy-Efficient Lighting: The Company has initiated Ujala scheme for replacement of traditional incandescent bulbs with energy-efficient LED bulbs, which has significantly reduced energy consumption and saved power purchase costs.
4. Energy Management Systems: The Company has implemented energy management systems to monitor and control energy consumption, identify areas of energy waste, and optimize energy usage.
5. Renewable Energy: The Company has increased the use of renewable energy sources, such as solar and mini hydro power, to reduce reliance on fossil fuels and reduce carbon emissions.
6. Energy Audits: Regular energy audits are conducted to identify energy waste and implement measures to reduce it.

Proposed Energy Conservation Measures for the Future:

- A. Installation of 100% metering at distribution transformers, replacement of old electro-mechanical meters with high quality electronic meters, meter Board Renovation, 100% metered supply, automatic Meter Reading System for high value consumers, In house meter testing facility (NABL accredited) to identify defective and faulty meters, starting of Pre-paid metering, implementation of Smart Street

Lighting Management System (SSLMS), installation of LT Aerial Bunched Conductor (ABC), installation of special tamper-evident paper seals in Service cut-out.

- B. 11 kV incomers shall be provided with capacitor bank with suitable capacity.
- C. Irrigation power consumers shall be provided with adequate capacity individual capacitors with their motors to manage the reactive load.
- D. Normal high loss distribution transformers should be replaced with star rating distribution transformer in phase manner.
- E. Normal conventional meter should be replaced with communicable prepaid smart meters.
- F. Augmentation of existing transformers at overloaded segments.
- G. Replacement or strengthening of conductor at overloaded segments is recommended.
- H. Recommended to provide aerial bunch conductor at theft prone area.
- I. Recommended to provide AMR meters for all HT installations.

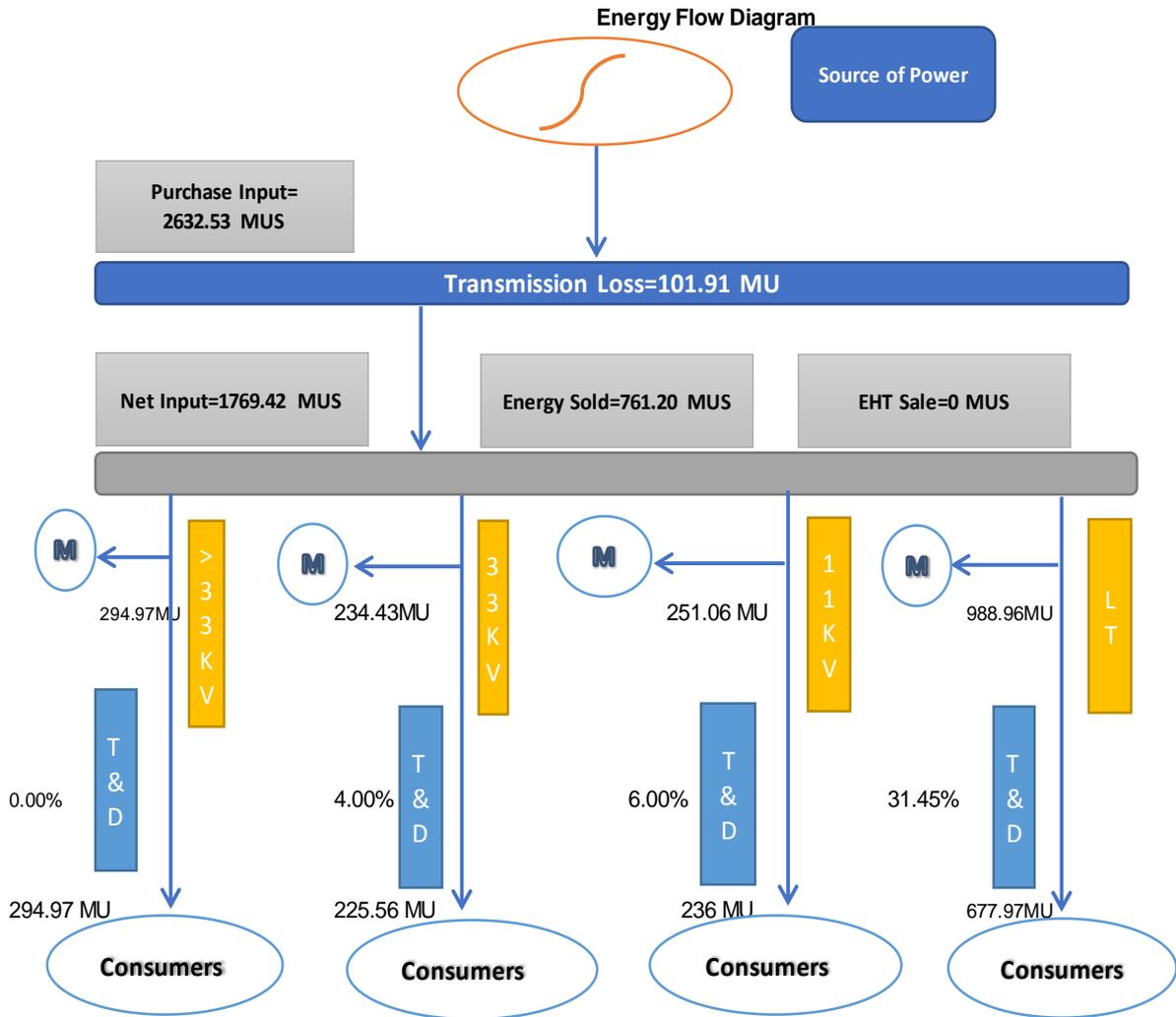
4. Energy flow analysis

4.1. Energy flow across 5 Service Levels

The Energy at different voltage levels and the losses at different levels are shown in below table long term energy, short term energy and renewable energy wise details are given below:

Table 19: Energy Flow at different Voltage level Losses for FY 2023-24

DISCOM	Input (in MU)	Sale (in MU)	Loss (in MU)	Loss %
LT	988.9593162	677.9735904	310.9857258	31.44575522
11 Kv	119.7106091	112.5279726	15.06369935	6
33 kv	234.4332763	225.0559452	9.37733105	4
> 33 kv	294.9688326	294.9688326	0	0



4.2. Validation of metered data

Field verification report

The Category wise metered consumers and unmetered consumers are shown in below table, As per the consumers details most of the consumers are residential which is 93.84% and the energy share is 33.19% of total consumers and energy, commercial/industrial LT is 5.58% of total consumers and energy share is 5.76% of total billed energy, commercial/industrial HT is 0.07% of total consumers and energy share is 53.05% of total billed energy.

Consumer category	Metered	Un-metered	Total Consumer	% share of Consumer	Metered Energy (MU)	Unmetered Energy	Total Billed Energy (MU)	% Share energy
Residential	629894	19034	648928	94.0%	582.98	17.74	600.71	41.9%
Agricultural	23	0	23	0.0%	0.20	0.00	0.20	0.0%
Commercial/Industrial-LT	37815	0	37815	5.5%	93.69	0.00	93.69	6.5%
Commercial/Industrial-HT	438	0	438	0.1%	630.20	0.00	630.20	43.9%
Others	3394	0	3394	0.5%	109.19	0.00	109.19	7.6%
Total	671564	19034	690598	100%	1416.26	17.74	1434.00	100%

Field visit of Substations, DTs and commercial building was done during the audit time.

It was found that there is low voltage problem in Phulbari area in Garo Hills.

It was also observed that most of the consumers are metered.

It was also observed that some of the meter and CT&PT is not in working condition.

At the time of field visit it was observed that capacitor banks are installed.

It was also observed that average power factor was found in the range of .90 to 0.99.

It was also observed that hourly load parameters are monitored in the logbook and energy consumption is monitored at every 24hr.

4.3. Validation of energy flow data and losses

Voltage wise power purchase details are not available, as the invoice of power purchase contains only units purchased and details of power plant voltage not available. Voltage wise energy flow data are not available, Input at different voltage level are not available. Majority of feeders are common to LT & HT. So, input energy supplied is inseparable.

5. Loss and subsidy computation

5.1. Energy accounts analysis for previous year

Previous cycle of audit is energy accounting base on the notification No. 18/1/BEE/DISCOM/2021 from Bureau of Energy Efficiency dated 6th October 2021.

a) Summary of AT&C losses for previous years

The AT&C losses for the FY 2020-21, 2021-22 & 2022-23 are as shown below:

Table 20: AT&C losses of previous years

Technical Details	UoM	FY 2020-21	FY 2021-22	FY 2022-23
Input Energy Purchase (From Generation Source)	Million kWh	2511.51	2460.84	2905.00
Net input energy (at DISCOM Periphery after adjusting the transmission losses and energy traded)	Million kWh	1818.14	2061.97	2127.18
Total Energy billed (is the Net energy billed, adjusted for energy traded))	Million kWh	1326.46	1549.63	1781.42
Transmission and Distribution (T&D) loss Details	Million kWh	491.69	512.33	345.77
	%	27.04%	24.85%	16.25%
Collection Efficiency	%	100.44%	99.84%	89.19%
Aggregate Technical & Commercial Loss	%	26.72%	24.96%	25.31%

b) Circle wise Consumer, Load & Energy consumptions for FY 2022-23

The circle wise input energy & Billed energy in different circle is given below the "Ri-Bhoi" circle having maximum energy billed and "West Garo Hills" circle having minimum energy billed. "Ri-Bhoi" have maximum input energy and "West Garo Hills" have minimum input energy as shown in table:

Table 21: Circle wise AT&C Losses in FY 2022-23

Circle	Total Number of connections		Total Connected Load		Input energy		Billed energy	
	Nos.	% Share	MW	% Share	MU	% Share	MU	% Share
Shillong Distribution Circle	134319	19.7%	354.850	29.4%	438.43	20.6%	383.08	21.5%
Khasi Hills Distribution Circle	143938	21.1%	177.563	14.7%	147.76	6.9%	95.92	5.4%
Ri-Bhoi Distribution Circle	64986	9.5%	275.824	22.9%	796.93	37.5%	736.16	41.3%
Jaintia Hills Distribution Circle	91584	13.4%	161.748	13.4%	386.40	18.2%	323.58	18.2%
Tura Distribution Circle	29355	4.3%	51.490	4.3%	60.09	2.8%	32.69	1.8%
East Garo Hills Distribution Circle	77996	11.4%	89.385	7.4%	117.46	5.5%	54.21	3.0%
West Garo Hills Distribution Circle	40568	5.9%	43.238	3.6%	53.69	2.5%	30.61	1.7%
Distribution Franchisee-1	71975	10.6%	42.014	3.5%	107.37	5.0%	106.45	6.0%
Distribution Franchisee-2	27312	4.0%	10.670	0.9%	19.06	0.9%	18.72	1.1%
Total	682033	100%	1206.78	100%	2127.18	100%	1718.84	100%

c) Circle wise Energy & Losses consumptions for FY 2022-23

The circle wise input energy & Billed energy in different circle is given below the "Ri-Bhoi" circle having maximum energy billed and "West Garo Hills" circle having minimum energy billed. "Ri-Bhoi" have maximum input energy and "West Garo Hills" have minimum input energy as shown in table:

Table 22: Circle wise AT&C Losses in FY 2022-23

Name of Circle	Input energy (MU)	Billed energy (MU)	T&D loss		Collection Efficiency	AT& C loss (%)
			(MU)	(%)		
Shillong Distribution Circle	438.43	383.08	55.35	12.6%	99.42%	13.1%
Khasi Hills Distribution Circle	147.76	95.92	51.83	35.1%	89.22%	42.1%
Ri-Bhoi Distribution Circle	796.93	736.16	60.78	7.6%	91.70%	15.3%
Jaintia Hills Distribution Circle	386.40	323.58	62.82	16.3%	80.03%	33.0%
Tura Distribution Circle	60.09	32.69	27.40	45.6%	88.34%	51.9%
East Garo Hills Distribution Circle	117.46	54.21	63.25	53.8%	55.08%	74.6%
West Garo Hills Distribution Circle	53.69	30.61	23.08	43.0%	48.94%	72.1%
Distribution Franchisee-1	107.37	106.45	0.92	0.9%	91.08%	9.7%
Distribution Franchisee-2	19.06	18.72	0.34	1.8%	109.51%	-7.6%
Total	2127.18	1718.84	345.77	16.3%	89.19%	25.3%

5.2. Energy accounts analysis and performance in current year (based on quarterly data)**5.2.1. Month wise Input energy and billed energy details**

The Month wise input energy & billed energy for FY 2023-24 of the Discom periphery is shown in below table.

Table 23: Month wise input energy & billed energy for FY 2023-24

Months	Purchase Units (MU)	Net Input Energy (MU)	Billed Energy (MU)
Apr-23	144.64	134.60	110.35
May-23	168.36	126.37	118.35
Jun-23	249.97	116.76	102.61
Jul-23	309.38	151.45	123.22
Aug-23	322.12	152.02	115.43
Sep-23	301.77	137.78	113.27
Oct-23	238.81	159.37	131.37
Nov-23	179.71	158.70	125.98
Dec-23	189.78	167.83	124.70
Jan-24	197.93	167.22	127.92
Feb-24	172.76	150.01	131.35
Mar-24	157.30	147.31	109.44
Total	2632.53	1769.42	1434.00

Note: Details Sheet Attached in Annexure

5.2.2. Quarterly and annual AT&C losses

The Quarter wise and annual AT&C losses for FY 2023-24 are shown in below table.

Table 24: Energy Input and AT&C Losses for FY 2023-24

Energy Input Details	Formula	UoM	Quarterly				Annual
			Q1	Q2	Q3	Q4	FY 23-24
Input Energy Purchase (From Generation Source)	A	MU	557.62	921.44	609.71	528.0	2632.53
Net input energy (at DISCOM Periphery after adjusting the transmission losses and energy traded)	B	MU	377.74	441.24	485.90	464.55	1769.42
Total Energy billed (is the Net energy billed, adjusted for energy traded)	C	MU	322.96	351.06	381.24	368.71	1434.00
Transmission and Distribution (T&D) loss Details	D	MU	54.78	90.19	104.66	95.84	335.43
	$E = D/B \times 100$	%	14.50%	20.44%	21.54%	20.63%	18.96%
Collection Efficiency	F	%	110%	103.26%	89.07%	105.96%	102.06%
Aggregate Technical & Commercial Loss	$G = 1 - \{(1 - E) \times \text{Min}(F, 100\%)\}$	%	6%	17.84%	30.12%	15.90%	17.29%

Note: These Values are provisional Data, Book of Account is yet to be finalize in Month of Sept.

5.2.3. Voltage wise AT&C losses

Voltage wise power purchase details are not available, as the invoice of power purchase contains only units purchased and details of power plant voltage not available.

Cumulated EHT sales MUs for 33kV and above are maintained and therefore bifurcations of same are not available.

The voltage wise AT&C losses of MePDCL for FY 2023-24 are as shown in the below table:

Table 25: Voltage-wise AT&C Losses for FY 2023-24

S. No.	Particulars	Units	Values
1	Losses in >33 KV System and Connected Equipment		
1.a.	Total Energy delivered into 132 KV Distribution System from EHT SSs	MUs	1769.42
1.b.	Energy consumed by HT consumers at 132KV (Sales + Third Party)	MUs	418.44
1.c.	Energy Delivered to lower voltage	MUs	1343.10
1.d.	Losses (132 kV System)	MUs	7.88
1.e.	% Losses (132 kV System)	%	1.85%
2	Losses in 33 KV System and Connected Equipment		
2.a.	Total Energy delivered into 33 KV Distribution System from EHT SSs	MUs	1343.1
2.b.	Energy consumed by HT consumers at 33KV (Sales + Third Party)	MUs	225.1
2.c.	Energy Delivered into 11 KV and LT System from 33/11 KV SSs	MUs	1108.7
2.d.	Losses (33 kV System)	MUs	9.4
2.e.	% Losses (33 kV System)	%	4.00%
3	Losses in 11 KV System and Connected Equipment		
3.a.	Total Energy delivered into 11 KV and LT Distribution System	MUs	1108.67
3.b.	Energy consumed by HT consumers at 11KV (Sales + Third Party)	MUs	112.53
3.c.	Total Output from 11kV to LT	MUs	988.96
3.d.	Losses (11kV System)	MUs	7.18
3.e.	% Losses (11kV System)	%	6.00%
4	Losses in LT system and connected equipment		

S. No.	Particulars	Units	Values
4.a.	Energy delivered to LT system from 11/400 V DTRs	MUs	988.96
4.b.	Energy sold at LT level	MUs	677.97
4.c.	Losses (LT System)	MUs	310.99
4.d.	% Losses (LT System)	%	31.45%
5	Total losses in the Distribution System		
5.a.	Total Input to the distribution system	MUs	1769.42
5.b.	Total Output from the Distribution System	MUs	1434.00
5.c.	Distribution System Losses	MUs	335.43
5.d.	% Distribution System Losses	%	18.96%

5.2.4. Circle wise AT&C losses analysis

1. Circle wise connections & energy consumptions for FY 2023-24

The circle wise connections, load, input energy & Billed energy with percentage share in different circle is given below the "Khasi Hills" circle having maximum numbers of consumers and "DF-2" circle having minimum numbers of consumers. "Ri Bhoi" have maximum input energy as well as billed units and "DF-2" have minimum input energy as well as billed units as shown in table:

Table 26: Circle wise No. of consumers, Input energy and Sales in FY 2023-24

Circle	Total Number of connections		Total Connected Load		Input energy		Billed energy	
	Nos.	% Share	MW	% Share	MU	% Share	MU	% Share
Shillong Distribution Circle	136128	19.71%	393.19	28.46%	458.94	25.94%	401.76	28.02%
Khasi Hills Distribution Circle	147767	21.40%	201.88	14.61%	149.05	8.42%	100.44	7.00%
Ri-Bhoi Distribution Circle	61634	8.92%	318.33	23.04%	580.50	32.81%	507.61	35.40%
Jaintia Hills Distribution Circle	90991	13.18%	197.73	14.31%	236.78	13.38%	178.713	12.46%
Tura Distribution Circle	28481	4.12%	57.66	4.17%	60.64	3.43%	38.36	2.67%
East Garo Hills Distribution Circle	80268	11.62%	100.533	7.28%	110.339	6.24%	56.292	3.93%
West Garo Hills Distribution Circle	41109	5.95%	50.62	3.66%	49.70	2.81%	27.35	1.91%
Distribution Franchisee-1	76403	11.06%	50.16	3.63%	105.50	5.96%	105.50	7.36%
Distribution Franchisee-2	27817	4.03%	11.47	0.83%	17.97	1.02%	17.97	1.25%
Total	690598	100.00%	1381.58	100.00%	1769.42	100.00%	1433.99	100.00%

2. Circle-wise AT&C losses

The circle wise AT&C losses are shown in the table below:

Table 27: Circle wise T&D losses, Collection Efficiency and AT&C losses for FY 2023-24

Name of Circle	Input energy (MU)	Billed energy (MU)	T&D loss		Collection Efficiency	AT&C loss (%)
			(MU)	(%)		
Shillong Distribution Circle	458.94	401.76	57.18	12.5%	101.89%	10.8%
Khasi Hills Distribution Circle	149.05	100.44	48.60	32.6%	104.39%	29.6%
Ri-Bhoi Distribution Circle	580.50	507.61	72.89	12.6%	103.92%	9.1%
Jaintia Hills Distribution Circle	236.78	178.713	58.064	24.5%	104.20%	21.4%
Tura Distribution Circle	60.64	38.36	22.28	36.7%	109.29%	30.9%

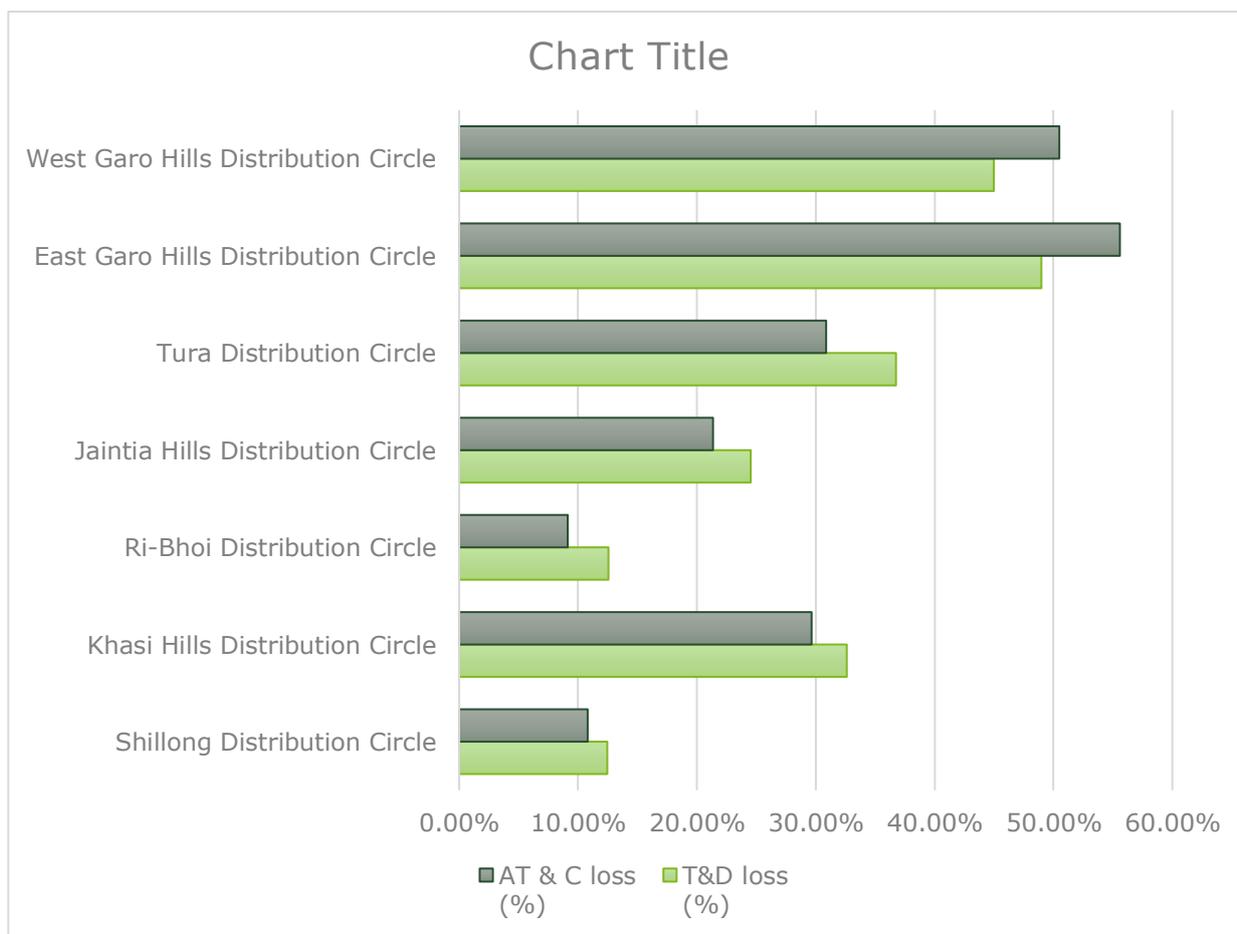
Name of Circle	Input energy (MU)	Billed energy (MU)	T&D loss		Collection Efficiency	AT& C loss (%)
			(MU)	(%)		
East Garo Hills Distribution Circle	110.339	56.292	54.047	49.0%	87.05%	55.6%
West Garo Hills Distribution Circle	49.70	27.35	22.36	45.0%	89.98%	50.5%
Distribution Franchisee-1	105.50	105.50	0.00	0.0%	82.44%	17.6%
Distribution Franchisee-2	17.97	17.97	0.00	0.0%	100.16%	-0.2%
Total	1769.42	1433.99	335.427	19.0%	102.06%	17.29%

Note: AT&C Losses calculation as per BEE proforma the calculation is as per actual Collection efficiency. MePDCL AT&C calculation is based on more than 100% collection efficiency.

3. High loss Circles

“Ri-Bhoi” Circle had the highest T&D loss both in quantum 72.89 MUs and T&D loss percentage of 12.56%. Therefore, “East Garo Hills” Circle must be prioritized to reduce the T&D loss in order to have overall reduction in AT&C losses of the DISCOM. Further, the circles with high loss that needs to be prioritized can be identified from the below chart:

Figure 5: Circle wise AT&C Losses (%) Vs T&D losses (%)



Division wise AT&C losses analysis

4. Division-wise AT&C losses

The Division wise AT&C losses are shown in the table below:

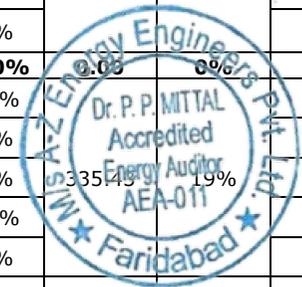
Table 28: Division wise T&D losses, Collection Efficiency and AT&C losses for FY 2023-24

S. No	Name of circle	Name of Division	Consumer category	Total Number of connections (Nos)	Total Connected Load (MW)	Input energy (MU)	Total energy (MU)	% of energy	T&D loss (MU)	T&D loss (%)	Billed Amount in Rs. Crore	Collected Amount in Rs. Crore	Collection Efficiency	AT & C loss (%)
1	Shillong Distribution Circle	Shillong Distribution Circle	Residential	120019	267.83	458.94	226.47	56%	57.18	12%	147.51	150.43	101.98%	
			Agricultural	1	0.01		0.00	0%			0.00	0.04	2258.56%	
			Commercial/Industrial-LT	14998	52.39		40.88	10%			39.46	39.33	99.67%	
			Commercial/Industrial-HT	134	22.77		58.80	15%			54.92	30.62	55.76%	
			Others	976	50.19		75.61	19%			70.08	97.42	139.03%	
Sub-total				136128	393.19	458.94	401.76	100%	57.18	12%	311.96	317.84	101.89%	11%
2	Khasi Hills Distribution Circle	East Khasi Hills Distribution Division	Residential	67240	79.58	68.59	36.31	71%	17.12	25%	22.49	24.76	110.09%	
			Agricultural	1	0.02		0.00	0%			0.00	0.00	0.00%	
			Commercial/Industrial-LT	2350	9.71		6.47	13%			6.05	6.38	105.44%	
			Commercial/Industrial-HT	8	2.39		5.80	11%			5.67	4.95	87.33%	
			Others	244	3.93		2.89	6%			2.96	4.21	142.54%	
Sub-total				69843	95.63	68.59	51.47	100%	17.12	25%	37.17	40.31	108.44%	19%
3	Khasi Hills Distribution Circle	West Khasi Hills Distribution Division	Residential	57915	66.43	55.84	27.37	71%	17.44	31%	18.07	17.68	97.82%	
			Agricultural	1	0.03		0.00	0%			0.01	0.01	100.43%	
			Commercial/Industrial-LT	2933	11.37		6.88	18%			6.66	6.72	100.92%	
			Commercial/Industrial-HT	23	2.26		2.79	7%			3.38	1.83	54.09%	
			Others	253	2.56		1.35	4%			1.32	4.09	309.90%	
Sub-total				61125	82.66	55.84	38.39	100%	17.44	31%	29.44	30.32	103.02%	29%
4	Khasi Hills Distribution Circle	South Khasi Hills Distribution Division	Residential	16120	20.85	24.62	8.60	81%	14.04	57%	5.53	3.71	67.08%	
			Agricultural	0	0.00		0.00	0%			0.00	0.00	0.00%	
			Commercial/Industrial-LT	605	1.54		0.76	7%			0.78	1.12	142.56%	
			Commercial/Industrial-HT	0	0.00		0.34	3%			0.37	0.00	0.00%	
			Others	74	1.21		0.89	8%			0.87	1.95	225.52%	
Sub-total				16799	23.60	24.62	10.58	100%	14.04	57%	7.55	6.78	89.82%	61%

S. No	Name of circle	Name of Division	Consumer category	Total Number of connections (Nos)	Total Connected Load (MW)	Input energy (MU)	Total energy (MU)	% of energy	T&D loss (MU)	T&D loss (%)	Billed Amount in Rs. Crore	Collected Amount in Rs. Crore	Collection Efficiency	AT & C loss (%)
5	Ri-Bhoi Distribution Circle	Umiam Distribution Division	Residential	29138	35.30	123.51	24.41	28%	36.23	29%	13.38	11.43	85.40%	
			Agricultural	2	0.01		0.00	0%			0.00	0.00	69.02%	
			Commercial/Industrial-LT	1314	5.24		3.71	4%			3.08	3.70	120.15%	
			Commercial/Industrial-HT	56	25.54		49.70	57%			36.91	39.54	107.12%	
			Others	122	5.35		9.45	11%			8.42	10.08	119.74%	
Sub-total				30632	71.44	123.51	87.28	100%	36.23	29%	61.79	64.74	104.79%	26%
6	Ri-Bhoi Distribution Circle	Nongpoh Distribution Division	Residential	22830	26.45	21.31	14.46	76%	2.34	11%	7.99	6.74	84.27%	
			Agricultural	2	0.02		0.02	0%			0.01	0.01	94.78%	
			Commercial/Industrial-LT	1225	4.24		3.03	16%			2.67	2.87	107.54%	
			Commercial/Industrial-HT	6	0.50		0.52	3%			0.64	0.64	100.46%	
			Others	151	2.18		0.94	5%			1.36	1.65	120.99%	
Sub-total				24214	33.37	21.31	18.97	100%	2.34	11%	12.67	11.90	93.93%	16%
7	Ri-Bhoi Distribution Circle	Byrnihat Distribution Division	Residential	5859	7.77	435.69	6.66	2%	34.33	8%	3.89	3.65	94.01%	
			Agricultural	0	0.00		0.00	0%			0.00	0.00	0.00%	
			Commercial/Industrial-LT	787	4.10		4.10	1%			3.75	4.53	120.92%	
			Commercial/Industrial-HT	116	201.34		390.46	97%			260.48	271.16	104.10%	
			Others	26	0.32		0.14	0%			0.18	0.19	108.17%	
Sub-total				6788	213.52	435.69	401.36	100%	34.33	8%	268.29	279.54	104.19%	4%
8	Jaintia Hills Distribution Circle	Khliehriat Distribution Division	Residential	23709	27.29	148.81	20.92	17%	28.05	19%	11.62	10.39	89.42%	
			Agricultural	0	0.00		0.00	0%			0.00	0.00	0.00%	
			Commercial/Industrial-LT	1776	7.30		5.41	4%			4.85	5.05	104.20%	
			Commercial/Industrial-HT	63	59.88		93.65	78%			90.80	93.93	103.45%	
			Others	110	4.17		0.77	1%			0.74	1.73	233.65%	
Sub-total				25658	98.64	148.81	120.76	100%	28.05	19%	108.01	111.10	102.87%	17%
9	Jaintia Hills Distribution Circle	Jowai Distribution Division	Residential	24856	36.46	49.52	24.74	70%	14.27	29%	15.25	16.70	109.46%	
			Agricultural	0	0.00		0.00	0%			0.00	0.00	0.00%	
			Commercial/Industrial-LT	2045	8.47		4.42	13%			4.00	3.36	83.83%	
			Commercial/Industrial-HT	6	0.71		4.25	12%			4.48	0.17	3.86%	
			Others	150	5.16		1.84	5%			1.96	7.89	402.47%	

S. No	Name of circle	Name of Division	Consumer category	Total Number of connections (Nos)	Total Connected Load (MW)	Input energy (MU)	Total energy (MU)	% of energy	T&D loss (MU)	T&D loss (%)	Billed Amount in Rs. Crore	Collected Amount in Rs. Crore	Collection Efficiency	AT & C loss (%)
Sub-total				27057	50.80	49.52	35.26	100%	14.27	29%	25.70	28.12	109.41%	22%
10	Jaintia Hills Distribution Circle	Jowai Rural Distribution Division	Residential	37205	40.06	38.44	17.54	77%	15.75	41%	10.02	10.14	101.23%	
			Agricultural	0	0.00		0.00	0%			0.00	0.00	0.00%	
			Commercial/Industrial-LT	970	5.78		3.47	15%			3.31	3.62	109.41%	
			Commercial/Industrial-HT	3	0.29		0.54	2%			0.95	0.17	18.00%	
			Others	98	2.17		1.14	5%			1.09	2.18	200.05%	
Sub-total				38276	48.30	38.44	22.70	100%	15.75	41%	15.37	16.11	104.84%	38%
11	Tura Distribution Circle	Tura Distribution Division	Residential	26708	44.67	60.64	27.96	73%	22.28	37%	18.01	19.60	108.83%	
			Agricultural	3	0.05		0.02	0%			0.01	0.01	96.56%	
			Commercial/Industrial-LT	1495	5.04		3.14	8%			2.87	3.14	109.39%	
			Commercial/Industrial-HT	12	1.58		3.55	9%			3.68	1.12	30.36%	
			Others	263	6.32		3.68	10%			4.45	7.85	176.29%	
Sub-total				28481	57.66	60.64	38.36	100%	22.28	37%	29.02	31.72	109.29%	31%
12	East Garo Hills Distribution Circle	South Garo Hills Distribution Division	Residential	15582	16.61	22.84	8.15	76%	12.15	53%	4.43	2.97	66.95%	
			Agricultural	2	0.00		0.00	0%			0.00	0.00	0.00%	
			Commercial/Industrial-LT	537	1.69		1.47	14%			1.37	0.85	62.18%	
			Commercial/Industrial-HT	0	0.00		0.04	0%			0.06	0.00	0.00%	
			Others	118	1.76		1.02	10%			0.99	1.31	132.11%	
Sub-total				16239	20.06	22.84	10.69	100%	12.15	53%	6.85	5.13	74.83%	65%
13	East Garo Hills Distribution Circle	East Garo Hills Distribution Division	Residential	61294	67.57	87.50	38.66	85%	41.90	48%	22.88	17.49	76.44%	
			Agricultural	3	0.02		0.00	0%			0.00	0.00	17.11%	
			Commercial/Industrial-LT	2472	7.52		5.73	13%			5.39	5.90	109.37%	
			Commercial/Industrial-HT	4	3.43		0.34	1%			0.39	0.14	34.80%	
			Others	256	1.95		0.85	2%			1.16	3.28	282.87%	
Sub-total				64029	80.48	87.50	45.60	100%	41.90	48%	29.82	26.80	89.86%	53%
14	West Garo Hills Distribution Circle	West Garo Hills Distribution Division	Residential	477	0.52	3.72	0.21	60%	3.37	91%	0.13	0.16	122.64%	
			Agricultural	0	0.00		0.00	0%			0.00	0.00	0.00%	
			Commercial/Industrial-LT	6	0.06		0.10	28%			0.08	0.09	102.15%	

S. No	Name of circle	Name of Division	Consumer category	Total Number of connections (Nos)	Total Connected Load (MW)	Input energy (MU)	Total energy (MU)	% of energy	T&D loss (MU)	T&D loss (%)	Billed Amount in Rs. Crore	Collected Amount in Rs. Crore	Collection Efficiency	AT & C loss (%)
			Commercial/Industrial-HT	0	0.00		0.00	0%			0.00	0.00	0.00%	
			Others	3	0.06		0.04	13%			0.04	0.08	187.11%	
Sub-total				486	0.64	3.72	0.35	100%	3.37	91%	0.26	0.33	126.80%	88%
15	West Garo Hills Distribution Circle	South-West Garo Hills Distribution Division	Residential	39208	41.99	45.99	20.79	77%	18.99	41%	11.40	8.02	70.35%	
			Agricultural	7	0.06		0.05	0%			0.05	0.05	98.53%	
			Commercial/Industrial-LT	1176	3.87		2.63	10%			2.52	2.66	105.80%	
			Commercial/Industrial-HT	2	0.21		0.26	1%			0.67	0.18	27.56%	
			Others	230	3.86		3.28	12%			2.80	4.68	166.93%	
Sub-total				40623	49.98	45.99	27.00	100%	18.99	41%	17.44	15.59	89.43%	47%
16	Distribution Franchisee_1	DF_FEDCO	Residential	73821	40.06	105.50	81.75	77%	0.00	0%	26.04	21.47	82.44%	
			Agricultural	1	0.02		0.10	0%			0.00	0.00	0.00%	
			Commercial/Industrial-LT	2399	7.19		1.47	1%			0.00	0.00	0.00%	
			Commercial/Industrial-HT	5	0.95		17.91	17%			0.00	0.00	0.00%	
			Others	177	1.95		4.26	4%			0.00	0.00	0.00%	
Sub-total				76403	50.16	105.50	105.50	100%	0.00	0%	26.04	21.47	82.44%	18%
17	Distribution Franchisee_2	DF_SAI	Residential	26947	9.11	17.97	15.71	87%	0.00	0%	6.69	6.70	100.16%	
			Agricultural	0	0.00		0.00	0%			0.00	0.00	0.00%	
			Commercial/Industrial-LT	727	1.34		0.00	0%			0.00	0.00	0.00%	
			Commercial/Industrial-HT	0	0.00		1.24	7%			0.00	0.00	0.00%	
			Others	143	1.03		1.02	6%			0.00	0.00	0.00%	
Sub-total				27817	11.47	17.97	17.97	100%	0.00	0%	6.69	6.70	100.16%	0%
			Residential	648928	828.52	1769.42	600.71	42%	335.43	19%	345.35	332.04	96.15%	
			Agricultural	23	0.22		0.20	0%			0.08	0.12	137.90%	
			Commercial/Industrial-LT	37815	136.85		93.69	7%			86.83	89.30	102.85%	
			Commercial/Industrial-HT	438	321.83		630.20	44%			463.38	444.45	95.91%	
			Others	3394	94.16		109.19	8%			98.41	148.60	150.99%	
Total				690598	1381.58	1769.42	1434.00	100%	335.43	18.96%	994.06	1014.51	102.06%	17.29%

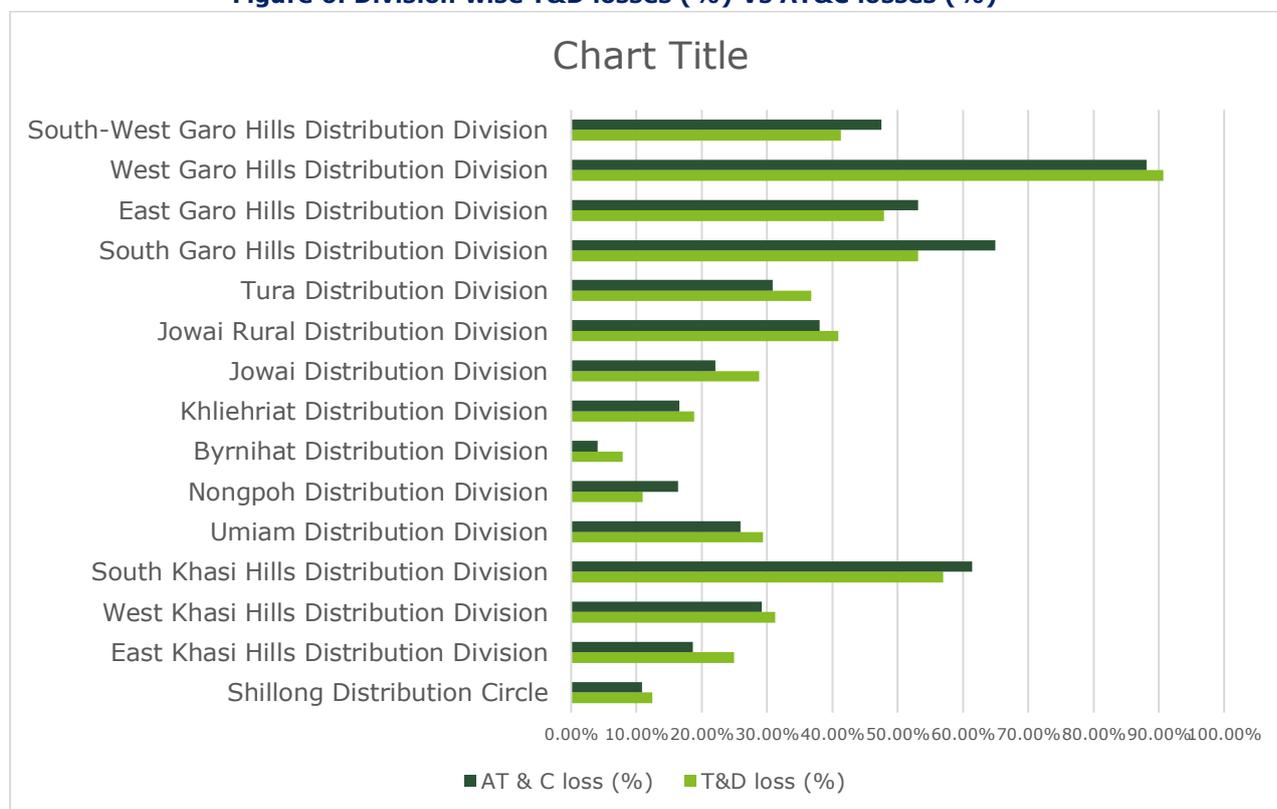


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5. High loss divisions

“Shillong Distribution” Division had the highest T&D loss quantum of 57.18 MU and West Garo Hills Distribution Division had the highest AT&C loss percentage of 88.2%. Further, the divisions with high loss that needs to be prioritized can be identified from the below chart:

Figure 6: Division wise T&D losses (%) Vs AT&C losses (%)



The list of top Divisions with higher AT&C losses (%) & T&D losses (MU) identified from the above chart are tabulated below:

Table 29: Top Divisions with higher AT&C losses (%) & T&D losses (MU)

Name of Division	T&D loss (MU)	T&D loss (%)	AT & C loss (%)
West Garo Hills Distribution Division	3.37	90.7%	88.2%
South Garo Hills Distribution Division	12.15	53.2%	65.0%
South Khasi Hills Distribution Division	14.04	57.0%	61.4%
East Garo Hills Distribution Division	41.90	47.9%	53.2%
South-West Garo Hills Distribution Division	18.99	41.3%	47.5%
Jowai Rural Distribution Division	15.75	41.0%	38.1%
Tura Distribution Division	22.28	36.7%	30.9%
West Khasi Hills Distribution Division	17.44	31.2%	29.2%
Umiam Distribution Division	36.23	29.3%	26.0%

Further, it was observed that the collection efficiency is not more than 100% across all the Divisions as shown below:

Figure 7: Division wise Collection efficiency (%)

5.2.5. Feeder wise AT&C losses analysis

1. Feeder wise T&D/ATC losses

Feeder-wise/unit-wise losses are not available due to:

- a. 33KV feeders are in Ring Main in shilling circle.
- b. 44% of total feeders are unmetered.
- c. 86 nos Feeders meter are Non DLMS (Device Language Message Specification) & 30 nos is not working.

100% consumer indexing is not in place; thus, feeder wise /DTR wise energy accounting or loss calculation is not possible.

MePDCL operates in small area comprising of single unit. Thus, loss of entire unit is given. However, from FY 2021-2022 onwards, unit wise loss can be provided by dividing the licensed area in units/divisions by proper arrangement at our end.

AT&C Losses of Some of the Feeders are monitored and the AT&C losses shown in below table:

Table 30: Feeder wise AT&C Loss FY 2023-24

Feeder Code/ID	Feeder Name	Type of Feeder	Type of feeder meter	Received at Feeder (Final in MU)	Feeder Consumption (In MU)	T&D losses	AT&C losses
42HHA04L01H01	11KV MENDIPATHAR	Urban	M	0.001875	0.001701	9.27%	94.85%
4122B01901D03	11KV MAWNGAP	Urban	M	0.003254	0.002957	9.13%	90.98%
4122A01500W03	11KV MALKI	Urban	M	0.565629	0.513581	9.20%	90.95%
133B02E0123	11KV MADAN LABAN	Urban	M	0.254814	0.23168	9.08%	90.93%
111A00201L4	11KV CAMEL BACK	Urban	M	0.538826	0.488078	9.42%	90.90%
4122B01A02P02	11KV POHKSEH	Urban	M	0.721704	0.655209	9.21%	90.79%
133B02G01U3	11KV MICRO TYLLANG	Urban	M	0.001	0.000906	9.38%	90.73%
133B02E0193	11KV NONGKWAR	Urban	M	0.065871	0.059752	9.29%	90.71%
133B02E0123	11KV MAIRANG CIVIL	Urban	M	0.007015	0.006344	9.57%	90.68%
4122B01901D02	11KV MAWPHLANG	Urban	M	0.007439	0.006744	9.35%	90.65%
4122B01900G01	11KV MAWJRONG	Urban	M	0.00099	0.000894	9.73%	90.63%
133B02E0193	11KV NONGLUM	Urban	M	0.010645	0.009639	9.45%	90.60%
4144A03D01T01	11KV UPPER CHERRA	Urban	M	0.002884	0.002611	9.47%	90.58%
4122A01701V03	11KV NONGRIM HILLS	Urban	M	0.493432	0.446922	9.43%	90.57%
111A00201L4	11KV BEADON-II	Urban	M	0.007868	0.007126	9.43%	90.57%
4122B01A02204	11KV NEW COLONY	Urban	M	1.941088	1.757975	9.43%	90.57%
4122B01900105	11KV MYLLIEM	Urban	M	0.142621	0.129093	9.49%	90.55%
133B02E0193	11KV Nongrim	Urban	M	0.001951	0.00176	9.81%	90.53%
4122B01B01J06	11KV JAI AW	Urban	M	0.004917	0.004451	9.47%	90.53%
4122A01801E01	11KV IEW DUH	Urban	M	0.021713	0.019644	9.53%	90.47%
4122A01500W05	11KV LABAN	Urban	M	1.017596	0.918699	9.72%	90.43%
133B02E0123	11KV LOWER CHERRA	Urban	M	0.012735	0.011516	9.57%	90.43%
4122B01A02205	11KV UMLING	Urban	M	0.424952	0.384124	9.61%	90.39%
4122A01801E02	11KV MAWPREM	Urban	M	0.607597	0.549168	9.62%	90.38%
133B02E0123	11KV LAWSOHTUN	Urban	M	0.012145	0.01097	9.67%	90.35%
4122B01901D01	11KV SOHIONG	Urban	M	1.98E-05	1.77E-05	10.79%	90.34%
133B02G01Z6	11KV SOHIONG	Urban	M	1.98E-05	1.77E-05	10.79%	90.34%
4122B01B01J03	11KV OAKLAND	Urban	M	0.024648	0.022267	9.66%	90.34%
4122B01B01J03	11KV OAKLAND	Urban	M	0.024648	0.022267	9.66%	90.34%
4122A01500W02	11KV BARABAZAR	Urban	M	0.083174	0.075106	9.70%	90.33%
133B02E01R2	11KV MAWROH	Urban	M	0.016374	0.014788	9.68%	90.32%
133A02A0132	11KV SMIT	Urban	M	0.0015	0.001355	9.70%	90.30%
111A0020253	11KV UMJAPUNG	Urban	M	0.002424	0.002188	9.72%	90.28%
#N/A	11KV TOWN	Urban	M	0.296756	0.267856	9.74%	90.26%
133B02E0191	11KV TOWN	Urban	M	0.296756	0.267856	9.74%	90.26%
4122A01701V05	11KV SPRINGSIDE	Urban	M	0.001434	0.001294	9.79%	90.21%
42JJA05L02001	11KV ASANANG	Rural	M	0.033187	0.029934	9.80%	90.10%
111A00201L4	11KV BIVAR ROAD	Urban	M	0.16533	0.150244	9.12%	90.10%
4122B01901402	11KV LAITLYNGKOT	Urban	M	0.00725	0.006578	9.27%	90.09%
4122B01A02206	11KV DEMSEINIONG	Urban	M	3.57616	3.221557	9.92%	90.08%
4122C01F01A01	11KV LAITKOR	Urban	M	0.323012	0.293342	9.19%	90.04%
4122B01A00M02	11KV LAITKOR	Urban	M	0.323012	0.293342	9.19%	90.04%
133B02G01A4	11KV SEINDULI	Urban	M	0.000158	0.000143	9.88%	90.02%

Feeder Code/ID	Feeder Name	Type of Feeder	Type of feeder meter	Received at Feeder (Final in MU)	Feeder Consumption (In MU)	T&D losses	AT&C losses
111A0020251	11KV SEINDULI	Urban	M	0.000158	0.000143	9.88%	90.02%
133A02C02F1	11KV TYRSAD	Urban	M	0.000112	0.000101	9.28%	90.01%
133B02E0193	11KV NONGKHLAW	Urban	M	0.000338	0.000304	9.89%	90.00%
4133B02E01903	11KV NONGKHLAW	Urban	M	0.000338	0.000304	9.89%	90.00%
133B02E01R2	11KV MAWBEH	Urban		0.000198	0.000176	11.48%	89.50%
133B02E01R2	11KV MAWEIT	Urban	M	0.00018	0.000157	12.70%	89.00%
133B02E01R3	11KV IEWRYNGHEP	Urban	M	0.287413	0.25325	11.89%	88.90%
144A03D01S04	11KV TYRNA	Urban	M	0.000346	0.000306	11.56%	88.56%
133B02E0194	11KV KYNSHI	Urban	M	0.001287	0.00112	12.96%	87.24%
4133B02E01901	11KV KYNSHI	Urban	M	0.001287	0.00112	12.96%	87.24%
4122B01B01J04	11KV LUMJINGSHAI	Urban	M	0.000409	0.00012	70.65%	36.46%

2. Identify high loss feeders

These are some Identified high loss feeders:

Table 31: High Losses Feeders FY 2023-24

Feeder Code/ID	Feeder Name	Type of Feeder	Type of feeder meter	Received at Feeder (Final in MU)	Feeder Consumption (In MU)	T&D losses	AT&C losses
42HHA04L01H01	11KV MENDIPATHAR	Urban	M	0.001875	0.001701	9.27%	94.85%
4122B01901D03	11KV MAWNGAP	Urban	M	0.003254	0.002957	9.13%	90.98%
4122A01500W03	11KV MALKI	Urban	M	0.565629	0.513581	9.20%	90.95%
133B02E0123	11KV MADAN LABAN	Urban	M	0.254814	0.23168	9.08%	90.93%
111A00201L4	11KV CAMEL BACK	Urban	M	0.538826	0.488078	9.42%	90.90%
4122B01A02P02	11KV POHKSEH	Urban	M	0.721704	0.655209	9.21%	90.79%
133B02G01U3	11KV MICRO TYLLANG	Urban	M	0.001	0.000906	9.38%	90.73%
133B02E0193	11KV NONGKWAR	Urban	M	0.065871	0.059752	9.29%	90.71%
133B02E0123	11KV MAIRANG CIVIL	Urban	M	0.007015	0.006344	9.57%	90.68%
4122B01901D02	11KV MAWPHLANG	Urban	M	0.007439	0.006744	9.35%	90.65%
4122B01900G01	11KV MAWJRONG	Urban	M	0.00099	0.000894	9.73%	90.63%
133B02E0193	11KV NONGLUM	Urban	M	0.010645	0.009639	9.45%	90.60%
4144A03D01T01	11KV UPPER CHERRA	Urban	M	0.002884	0.002611	9.47%	90.58%
4122A01701V03	11KV NONGRIM HILLS	Urban	M	0.493432	0.446922	9.43%	90.57%
111A00201L4	11KV BEADON-II	Urban	M	0.007868	0.007126	9.43%	90.57%
4122B01A02204	11KV NEW COLONY	Urban	M	1.941088	1.757975	9.43%	90.57%
4122B01900105	11KV MYLLIEM	Urban	M	0.142621	0.129093	9.49%	90.55%
133B02E0193	11KV Nongrim	Urban	M	0.001951	0.00176	9.81%	90.53%
4122B01B01J06	11KV JIAIW	Urban	M	0.004917	0.004451	9.47%	90.53%
4122A01801E01	11KV IEWDUH	Urban	M	0.021713	0.019644	9.53%	90.47%
4122A01500W05	11KV LABAN	Urban	M	1.017596	0.918699	9.72%	90.43%
133B02E0123	11KV LOWER CHERRA	Urban	M	0.012735	0.011516	9.57%	90.43%
4122B01A02205	11KV UMLING	Urban	M	0.424952	0.384124	9.61%	90.39%
4122A01801E02	11KV MAWPREM	Urban	M	0.607597	0.549168	9.62%	90.38%
133B02E0123	11KV LAWSOHTUN	Urban	M	0.012145	0.01097	9.67%	90.35%

Feeder Code/ID	Feeder Name	Type of Feeder	Type of feeder meter	Received at Feeder (Final in MU)	Feeder Consumption (In MU)	T&D losses	AT&C losses
4122B01901D01	11KV SOHIONG	Urban	M	1.98E-05	1.77E-05	10.79%	90.34%
133B02G01Z6	11KV SOHIONG	Urban	M	1.98E-05	1.77E-05	10.79%	90.34%
4122B01B01J03	11KV OAKLAND	Urban	M	0.024648	0.022267	9.66%	90.34%
4122B01B01J03	11KV OAKLAND	Urban	M	0.024648	0.022267	9.66%	90.34%
4122A01500W02	11KV BARABAZAR	Urban	M	0.083174	0.075106	9.70%	90.33%
133B02E01R2	11KV MAWROH	Urban	M	0.016374	0.014788	9.68%	90.32%
133A02A0132	11KV SMIT	Urban	M	0.0015	0.001355	9.70%	90.30%
111A0020253	11KV UMJAPUNG	Urban	M	0.002424	0.002188	9.72%	90.28%
#N/A	11KV TOWN	Urban	M	0.296756	0.267856	9.74%	90.26%
133B02E0191	11KV TOWN	Urban	M	0.296756	0.267856	9.74%	90.26%
4122A01701V05	11KV SPRINGSIDE	Urban	M	0.001434	0.001294	9.79%	90.21%
42JJA05L02001	11KV ASANANG	Rural	M	0.033187	0.029934	9.80%	90.10%

3. Transformer Loss Analysis Report

These are some Identified high loss feeders:

Monthly Energy Reading of 33/11 KV Keatinge Road Sub Station under R-APDRP Town for the month of June 2024.							
Name & Capacity of Sub-Station: Keating Road Sub-Station 2x7.5MVA							
Sl. No.	Name of Feeder	Meter No	O.M.F	Reading		Unit	Total energy (kwh)
				Initial	Final		
a	B	c	d	e	f	$g = f - e$	$h = g * d$
A. Energy Received at 33KV level							
1	IN-COMING -I	MECL0302	24000	23079.27	23205.75	126.48	3035520
2	IN-COMING-II	MECL0301	24000	185.12	185.12	0.00	0
Total							3035520
B. Energy Sent Out at 33KV level							
1	Nil	0	0	0	0	0.00	0
Total							0
C. Energy Received Out at 11KV level							
1	IN-COMER - I	18164191	2000				CT defective
2	IN-COMER - II	18042305	2000	63649.75	63649.75	0	0
3							
Total							0
D. Energy Sent Out at 11KV level							
1	MES	18130674	2000	6556.37	6681.15	124.78	249560
2	BARA BAZAAR	18130684	2000	19321.57	19513.20	191.63	383260
3	LABAN	18164157	2000	27532.89	27936.05	403.16	806320
4	OAKLAND	18164166	2000	21946.38	22244.43	298.05	596100
5	MALKI	18164168	2000	25379.22	25738.03	358.81	717620
Total							2752860

E. Station service consumption							
1		278989	1	77253.20	77676.80	423.60	423.6
F. Transformation loss							
1	Total Energy Received at 33KV level (A)	3035520					
2	Total Energy Sent Out at 33KV level (B)	0					
3	Net Energy Received at 33KV level (1-2)	3035520					
4	Total Energy Sent Out at 11KV level (D)	2752860					
5	Transformation loss (3-4)	282660					
6	% Transformation loss [(5/3)x100]	9.31%					

5.2.6. Identify overloaded segments/ infrastructure

UL (Under loaded): 20% of kVA rating for more than 90% of time where peak kVA < 40% of kVA rating

OL (Overloaded): 95% of kVA rating for at least half an hour

UB (Unbalanced): Relative phase wise unbalance is > 150% or < 50% and peak kVA of the transformer is at least 50% of kVA rating.

Energy meters are installed at each voltage level for energy consumption. The readings are taken manually.

The energy reading of commercial and Industrial consumers, Distribution transformer readings are downloaded by the appropriate software for billing and analysis.

There is 97% metering available at consumers. Also MePDCL has claimed that there is approx 29% metering at DTs transformers.

The energy consumed by MePDCL offices, receiving stations is also metered and accounted.

5.3. Subsidy computation and analysis (based on quarterly data)

NA

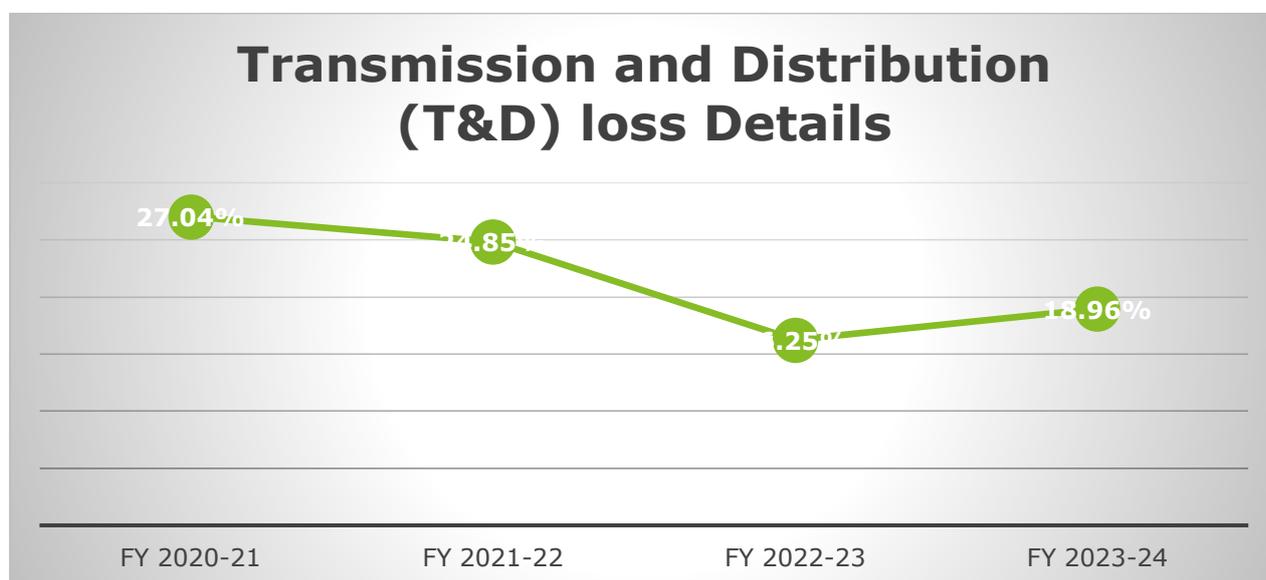
5.4. Trend analysis and identification of key exceptions

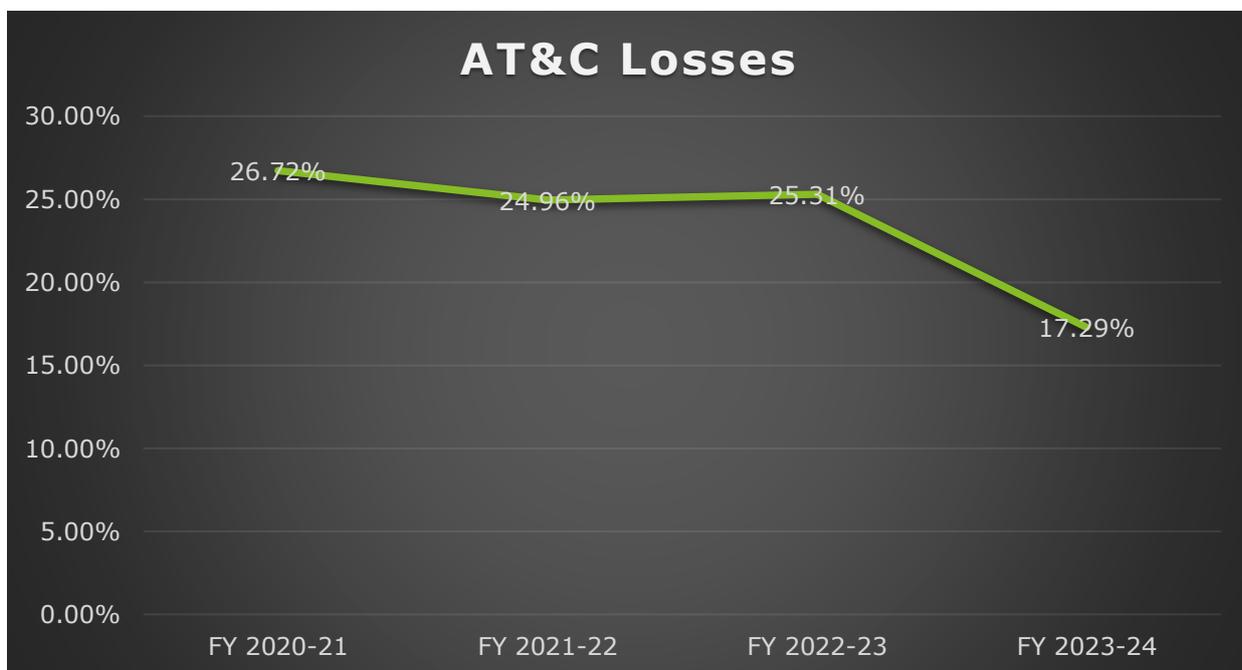
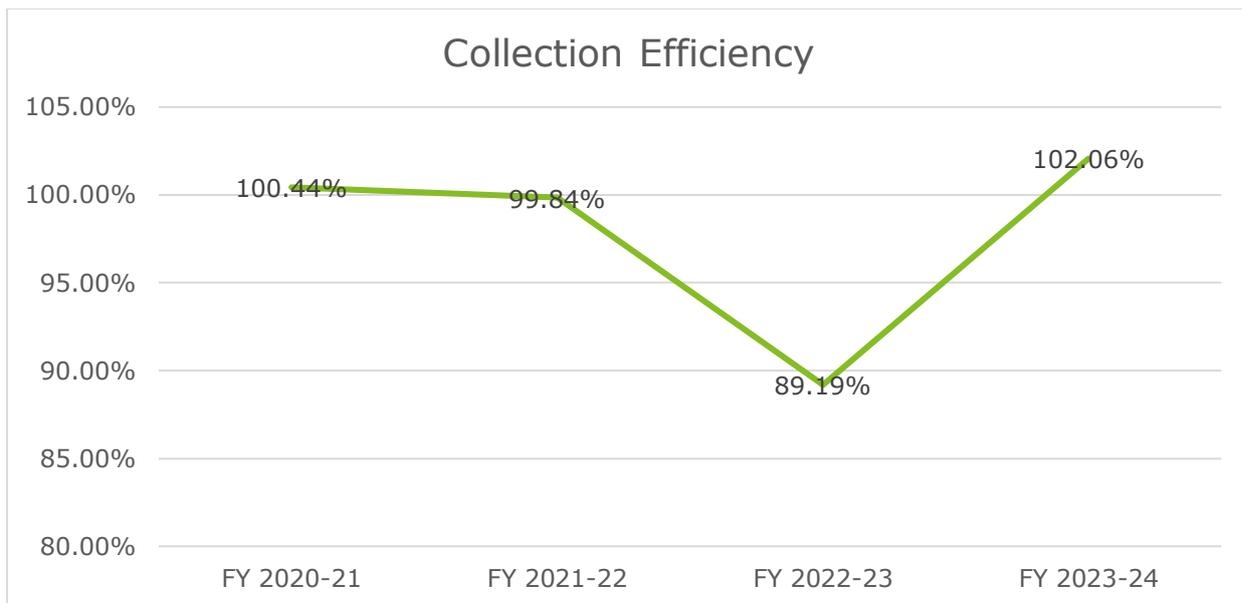
Details maybe specified such as performance of DISCOM in FY 2020-21 Vs FY2021-22 Vs 2022-23 and FY 2023-24 annually comparison, circle wise analysis, where the DISCOM has improved and where needs improvement, etc.

a) Summary of AT&C losses comparison for previous years

Table 32: AT&C loss Comparison for last three Years

Technical Details	UoM	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
Input Energy Purchase (From Generation Source) *	Million kWh	2511.51	2460.84	2905.00	2632.53
Net input energy (at DISCOM Periphery after adjusting the transmission losses and energy traded)	Million kWh	1818.14	2061.97	2127.18	1769.42
Total Energy billed (is the Net energy billed, adjusted for energy traded))	Million kWh	1326.46	1549.63	1781.42	1434.00
Transmission and Distribution (T&D) loss Details	Million kWh	491.69	512.33	345.77	335.43
	%	27.04%	24.85%	16.25%	18.96%
Collection Efficiency	%	100.44%	99.84%	89.19%	102.06%
Aggregate Technical & Commercial Loss	%	26.72%	24.96%	25.31%	17.29%





The trend of reduction in distribution loss has reached a trough during the past few years. Marginal rate of reduction of distribution loss becomes extremely low. Further reduction will involve significant capital and operational expenditure and may prove to be counter-productive for the consumers

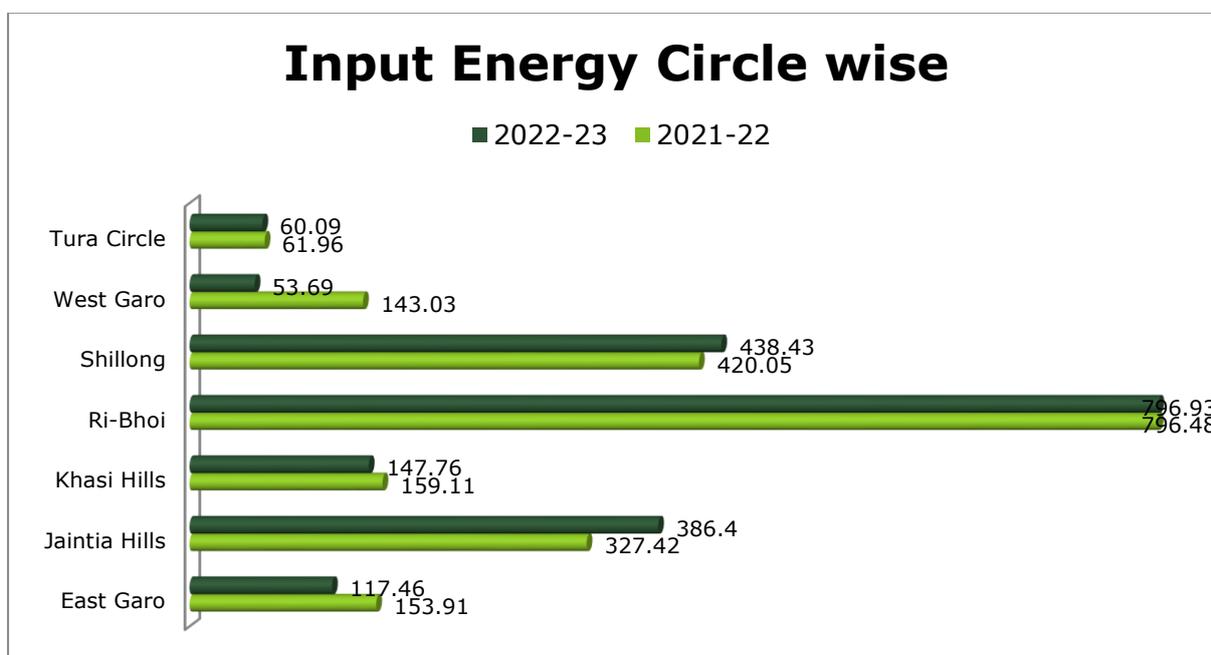
As we compare the losses for last four years it was found that T&D losses is decreasing trend as compare to first three years and collection efficiency is also decreasing trends, hence AT&C losses is increasing.

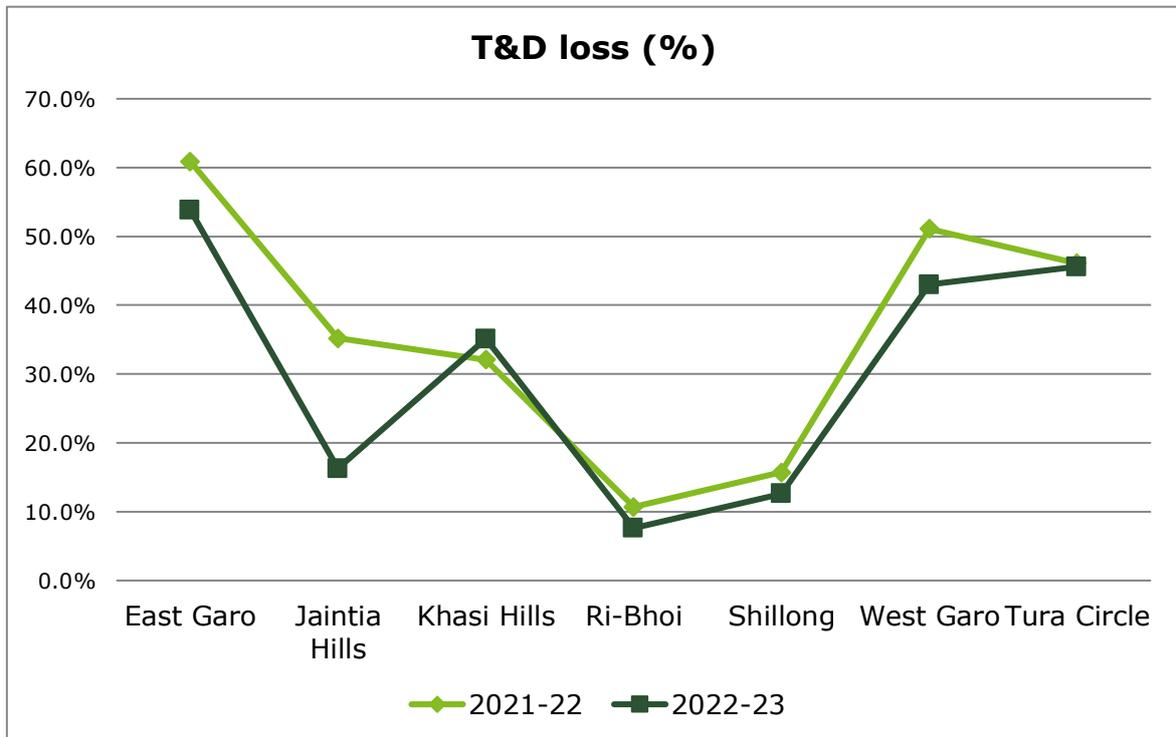
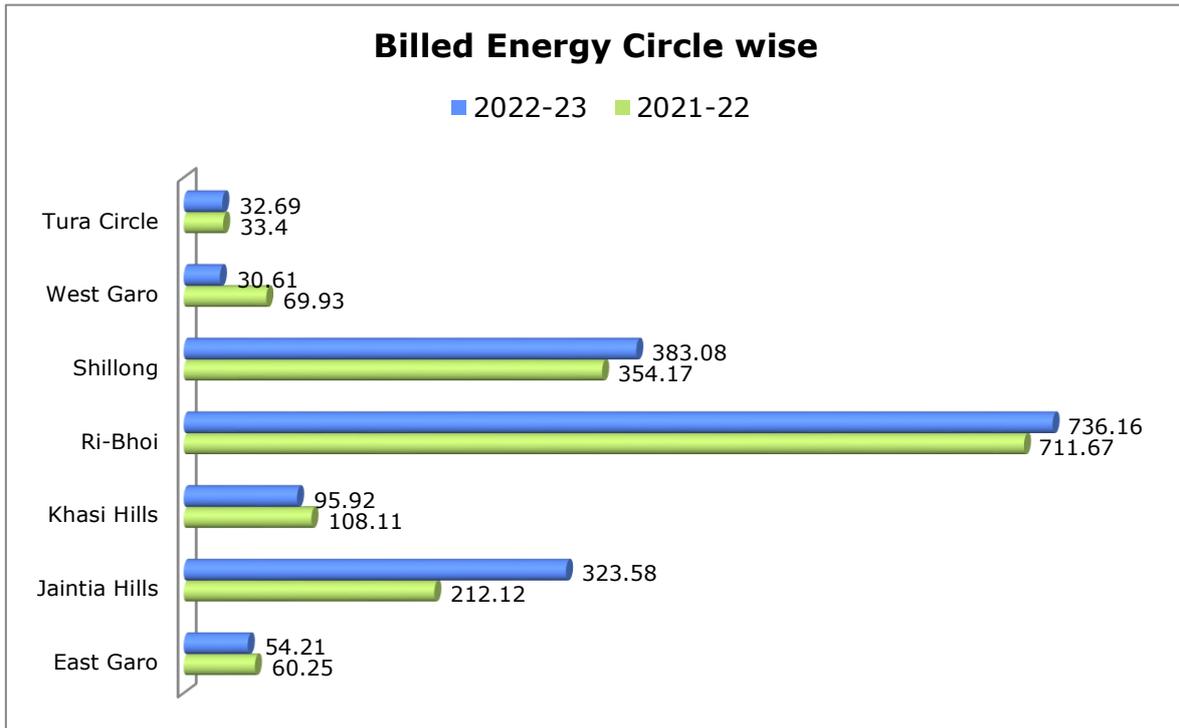
b) Circle wise Energy & Losses Comparison

The circle wise input energy, Billed energy & losses comparison is shown in below table:

Table 33: Circle wise Energy & Losses Comparison

Particulars	Input Energy (MU)		Billed Energy (MU)		Loss (MU)		Loss (%)	
	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23
East Garo	153.91	117.46	60.25	54.21	93.67	63.25	60.90%	53.85%
Jaintia Hills	327.42	386.4	212.12	323.58	115.3	62.82	35.20%	16.26%
Khasi Hills	159.11	147.76	108.11	95.92	50.99	51.84	32.10%	35.08%
Ri-Bhoi	796.48	796.93	711.67	736.16	84.82	60.77	10.70%	7.63%
Shillong	420.05	438.43	354.17	383.08	65.88	55.35	15.70%	12.62%
West Garo	143.03	53.69	69.93	30.61	73.1	23.08	51.10%	42.99%
Tura Circle	61.96	60.09	33.4	32.69	28.56	27.4	46.10%	45.60%
Total	2061.96	2000.76	1549.65	1656.25	512.31	344.51	24.90%	17.22%



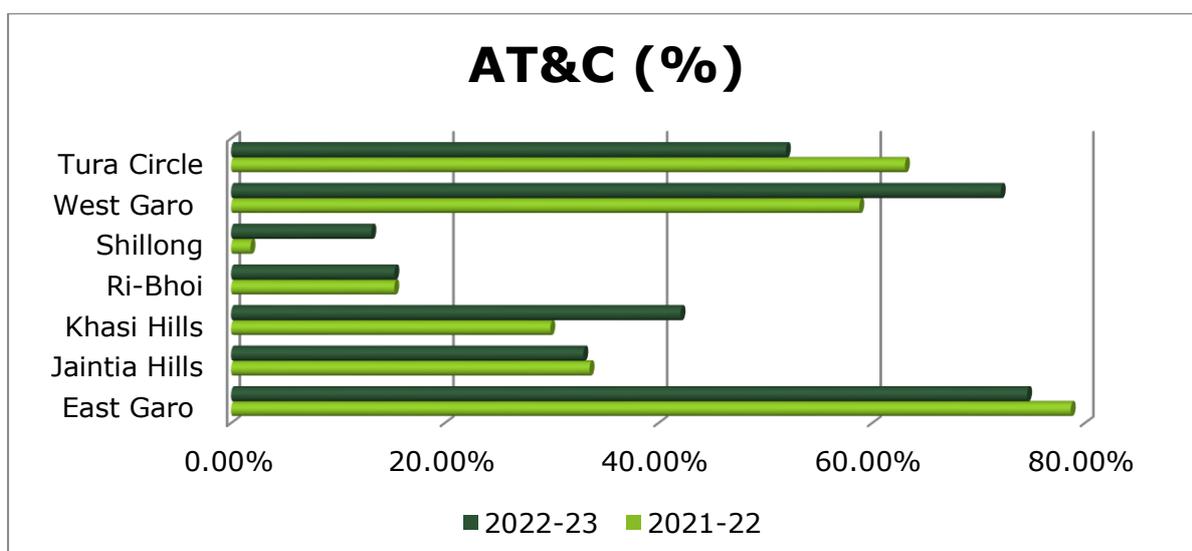
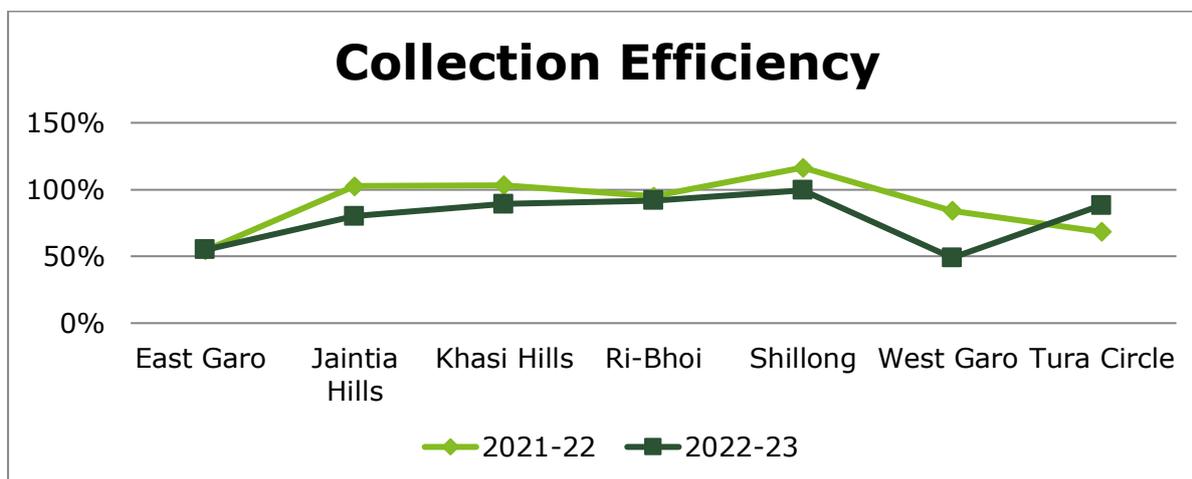


c) Circle wise Collection & AT&C Losses comparison

The circle wise Billed, Collection Amount & AT&C losses comparison is shown in below table:

Table 34: Circle wise Collection Efficiency & AT&C Losses Comparison

Particulars	Billed Amount		Collection Amount		Collection Efficiency (%)		AT&C (%)	
	(Cr)		(Cr)					
	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23
East Garo	34.11	32.65	18.57	17.98	54.44%	55.07%	78.69%	74.58%
Jaintia Hills	126.36	228.03	129.59	182.498	102.55%	80.03%	33.56%	32.98%
Khasi Hills	68.21	62.81	70.37	56.04	103.17%	89.22%	29.89%	42.08%
Ri-Bhoi	392.19	424.31	371.88	389.114	94.82%	91.71%	15.28%	15.29%
Shillong	252.09	266.61	293.53	265.07	116.44%	99.42%	1.82%	13.13%
West Garo	38.46	18.05	32.39	8.83	84.23%	48.92%	58.82%	72.10%
Tura Circle	20.19	22.06	13.82	19.485	68.47%	88.33%	63.09%	51.94%
Total	931.6	1054.52	930.15	939.017	99.84%	89.05%	24.96%	



6. Energy Audit findings

6.1. Review of capacity of DISCOM's energy accounting and audit wing

The Energy Accounting/Audit cell in the DISCOM has been established on 16-05-22. The Organogram of the DISCOM is as shown below:

Figure 8: Organogram of Energy accounting cell in the DISCOM

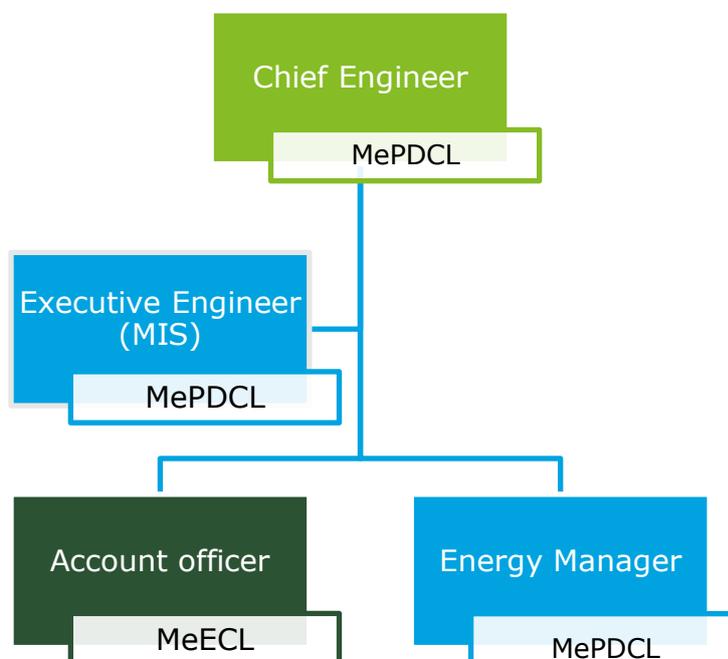


Table 35: Details of energy manager and Authorized signatory of DISCOM

Designation	Name of Officers
Chief Engineer (Comm.)	Shri. SS Kharmih
Executive Engineer (MIS)	Smti. S. Rymbai
Accounts Officer	Shri. A. Myllemngap
Energy Manager	Shri. S. Mandal

6.2. Critical Analysis

- Verified transmission losses, distribution (T&D) losses, collection efficiency & aggregate technical & commercial losses of MePDCL for FY23-24, i.e., 1st April 2023 to 31st March 2024 is 4%, 18.96%, 102.06% & 17.29% respectively.
- MePDCL calculation methodology of AT&C Losses calculated on more than 100% collection efficiency.
- Detail of received source data is provide because power purchase for DISCOM is done by MePDCL. They have only provided monthly Purchased bills.

- The electrical energy which is supplied by various interstate Purchase power agreement at 220 KV, 132KV, 33 KV and same is supplied to customers at 132 KV, 33 KV, 11 KV, 400V and 230 V single phase.
- MePDCL has 100 % metering available at 11/33/66 KV system. However, there is 97% metering at consumer end and 29% metering available at DT.
- MePDCL is a very vast distribution network having 7 numbers of circles, 17 numbers of divisions, 52 numbers of sub-division, 526 numbers of feeders, 13477 number of DTs and 690598 numbers of consumers.
- MePDCL will be able to provide the Feeder wise Input Energy, Feeder wise billed energy after completion of installation of feeder meters and DT meters and mapping in each feeder.
- At the time of field visit it was found that at maximum substation the average power factor is above 0.95-0.99, which is satisfactory.
- Voltage wise power purchase details are not available, as the invoice of power purchase contains only units purchased and details of power plant voltage not available.
- Majority of feeders are common to LT & HT. So input energy supplied is inseparable.
- Cumulated EHT sales MUs for 33kV and above are maintained and therefore bifurcations of same are not available.
- Some of the meters were found faulty and CT & PT ratio is not working condition.
- Capacitor bank is already installed at some of the substation.
- There is low voltage problem in phulbari area in Garo Hills
- At present HT/LT ratio of DISCOM is 0.697.
- Need to improve HT/LT ratio by providing (High Voltage Distribution System) HVDS system.

6.2.1. Status and progress in compliance to pre-requisites to energy accounting

This Energy Audit report is being issued within the timeline stipulated in Regulations and hence no further comments from Energy Auditor with regards to this aspect.

It was observed that there has been significant delay in submission of Quarterly Accounts during three Quarters (i.e., Q1, Q2, and Q3 FY 2022-23), quarterly report Q4 is also submitted to BEE. The Quarterly accounts within the timeframe stipulated in the Regulations. Further, the compliance with regards to Regulations and Pre-requisites are tabulated in the table below:

Table 36: Compliance status w.r.t Timelines and Pre-requisites

Clause	Details	Sub-Clause	Criteria	Compliance Status
3	Intervals of time for conduct of annual energy audit	A	Conducted an annual energy audit for every financial year and submitted the annual energy audit report to the Bureau and respective State. Designated Agency and also made available on the website of the electricity distribution company within a period of four months from the expiry of the relevant financial year	Yes
4	Intervals of time for conduct of periodic energy accounting.	A	All feeder wise, circle wise and division wise periodic energy accounting is conducted by the energy manager of the electricity distribution company for each quarter of the financial year.	Yes
		B	All feeder wise, circle wise and division wise periodic energy accounting is conducted by the energy manager of the electricity distribution company for each quarter of the financial year.	Yes
		C	Electricity distribution company conducted its first periodic energy accounting, for the last quarter of the financial year immediately preceding the date of such commencement (i.e., 6th October 2021)	Yes
		D	Electricity distribution company conducted its subsequent periodic energy accounting for each quarter of the financial year for a period of two financial years from the date of such commencement and submits the periodic energy accounting report within sixty days from the date of periodic energy accounting.	Yes
5	Pre-requisites for annual energy audit and periodic energy accounting	A	Pre-requisites for annual energy audit and periodic energy accounting	Yes
		B	Identification and mapping of high tension and low-tension consumers	Yes
		C	Development and implementation of information technology enabled energy accounting and audit system, including associated software	Under Progress
		d	Electricity distribution company ensures the installation of functional meters for all consumers, transformers and feeders. Meter installation is done in a phased manner within a period of three financial years	Under Progress

Clause	Details	Sub-Clause	Criteria	Compliance Status
			from the date of the commencement of these regulations in accordance with the trajectory set out in the First Schedule	
			d.1. 100% Communicable Feeder Metering integrated with AMI, by 31st December 2022 along with replacement of existing non-communicable feeder meters.	
			d.2. All Distribution Transformers (other than HVDS DT up to 25kVA and other DTs below 25 kVA) shall be metered with communicable meters. Communicable DT Metering for the following areas/ consumers to be completed by December 2023 and in balance areas by December 2025:	Under Progress
			d.2.1. All Electricity Divisions of 500 AMRUT cities, with AT&C Losses > 15%	
			d.2.2. All Union Territories (for areas with technical difficulty, non-communicable meters may be installed)	
			d.2.3. All Industrial and Commercial consumers	
			d.2.4. All Government offices at Block level and above	
			d.2.5. Other high loss areas i.e., rural areas with losses more than 25% and urban areas with losses more than 15%	
			d.3. Prepaid Smart Consumer Metering to be completed for all directly connected meters and AMR in case of other meters, by December 2023 in the following areas:	
			d.3.1. All Electricity Divisions of 500 AMRUT cities, with AT&C Losses > 15%;	
			d.3.2. All Union Territories (for areas with technical difficulty, prepaid meters to be installed);	
			d.3.3. All Industrial and Commercial consumers;	
			d.3.4. All Government offices at Block level and above;	
			d.3.5. Other high loss areas i.e., rural areas with losses more than 25% and urban areas with losses more than 15%.	
			d.4. Consumer Metering: 98% by FY 2022-23 99% by FY 2023-24	

Clause	Details	Sub-Clause	Criteria	Compliance Status
			d.5. Targets for functional meters - Meter FY 22-23 FY 23-24 FY24-25 Feeder metering 98.5% 99.5% 99.5% DT metering 90% 95% 98% Consumer metering 93% 96% 98	
		e	e.1. All distribution transformers (other than high voltage distribution system up to 25kVA and other distribution system below 25 kVA) is metered with communicable meters.	
			e.2. And existing non communicable distribution transformer meters is replaced with communicable meters and integrated with advanced metering infrastructure.	
		f	Electricity distribution company has established an information technology enabled system to create energy accounting reports without any manual interference and such systems may be within a period of three years from the date of the commencement of these regulations in case of urban and priority area consumers; and within five years from the date of the commencement of these regulations in case of rural consumers	
		g	Electricity distribution company has a centralized energy accounting and audit cell comprising of (i) a nodal officer, an energy manager and an information technology manager, having professional experience of not less than five years; and (ii) a financial manager having professional experience of not less than five years	
6	Reporting requirements for annual energy audit and periodic energy accounting	a	Electricity distribution company has a nodal officer, who is a full time employee of the electricity distribution company in the rank of the Chief Engineer or above, for the purpose of reporting of the annual energy audit and periodic energy accounting and communicate the same to the Bureau	Yes
		b	Electricity distribution company ensures that the energy accounting data is generated from a metering system or till such time the metering system is	Yes, Under Process

Clause	Details	Sub-Clause	Criteria	Compliance Status
			not in place, by an agreed method of assumption as may be prescribed by the State Commission.	
		c	Metering of distribution transformers at High Voltage Distribution System up to 25KVA is done on cluster meter installed by the electricity distribution company	Under Process
		d	The energy accounting and audit system and software is developed to create monthly, quarterly and yearly energy accounting reports.	
		c	Electricity distribution company has provided the details of the information technology system in place as specified in clause (f) of regulation 5 that ensures minimal manual intervention in creating the energy accounting reports and any manual intervention of any nature, in respect of the period specified therein, shall be clearly indicated in the periodic energy accounting report	Under Process

6.2.2. Data gaps

The Audit firm has raised the data gaps to the DISCOM. The summary of data gaps raised and response from DISCOM is summarized in the table below:

Table 37: Summary of Data gaps

S. No.	Data gaps raised by Energy Auditor	Response shared by DISCOM	Status of data submission by DISCOM
1	DT Wise losses are not in account.	DT Wise Mapping is in progress.	100% DT metering (Smart) to be done under RDSS
2	Feeder wise AT&C losses is not in account	Sample feeder wise losses is monitored and accounted attached above	100% Feeder metering (Smart) to be done under RDSS
3	Voltage wise consumer & Sold unit is not available	Voltage wise bifurcation is not available	Voltage tagging will be completed by end of July 24

6.2.3. Summary of key responses of DISCOM management on Comments by Energy Auditor

The Auditor has identified the key issued with regards to Energy Accounting/Audit and DISCOM's management has responded to the same as summarized in the table below:

Table 38: Comments by Energy Auditor and responses of DISCOM management

S. No.	Comments by Energy Auditor	Response of DISCOM's management
1	Kindly provide the identification and mapping of all of the electrical network assets.	Division Wise schematic were shown
2	Kindly provide the identification and mapping of high tension and low-tension consumers	Schematic maps for 11kV feeder were Shown.
3	DT wise losses is not is account	DT wise metering is under process.
4	Energy (Electrical) Purchase report for the year 2023-24	Provided by MePDCL
5	Energy sold outside the discom	Energy sold outside Provided
6	Energy Conservational Schemes implemented	Provided
7	Energy conservational Schemes to be implemented	Provided
8	Quarter wise report	Provided
9	Voltage wise losses are not available	Under process

6.3. Revised findings based on data validation and field verification

MePDCL officials responded to the data gaps and the plan for the site visit with Accredited Energy Auditor was prepared. The field visits were conducted in the month of August 2023. The schedule of the visits is as follows. Details along with Photo are enclosed in annexure

1. During field interaction & on-site visit auditor wanted to know the status of identification and mapping status of all of the electrical network assets, status of identification and mapping of high tension and low-tension consumers, status of the development and implementation of information technology status enabled energy accounting and audit system, including associated software, installation status of functional meters for consumers, transformers and feeders, status of adoption of an information technology enabled system to create energy accounting report reports without any manual interference and status of formation of cell for centralized energy accounting etc.
2. During field interaction & on-site visit auditor observed that MePDCL possessed communicable meters connected with feeders of MePDCL for capturing loss data, having system for identification and mapping of all high-tension consumers, but not

having for low tension consumers. Still, during verification processes in their conference hall, MePDCL was unable to show the loss figures in details for feeders (Sample feeder wise mapping and losses are shown)/DTRs in their records.

3. Management response for action plan of MePDCL was found to be very positive and MePDCL was agreed upon to implement it with top priority within the target stipulated in pre-requisites of BEE's regulation.
4. Network diagram of the few feeders with high loss checked
5. The condition of the conductor and the reason for the loss were discussed.
6. The input point meter serial number validation is carried out.
7. The sending end voltage level. It is injection point of the MePDCL
8. The energy accounting process validated for each circle.
9. Input energy data cross verification.
10. Metering points and their energy break up.
11. Check list submitted to the MePDCL and data gaps of the submitted data explained.
12. At the time of field visit it was found that at maximum substation the average power factor is above 0.95, which is satisfactory.
13. Some of the meters were found faulty and CT & PT ratio is not working condition.
14. Need to survey and replace conductor of proper capacity.
15. Need to cut tree branches touching to conductors.
16. Need to tighten the jumpers.

6.4. Inclusions and Exclusions

NA

7. Conclusion and Action Plan

7.1. Summary of critical analysis and way forward proposed by Energy Auditor

The primary energy-consuming areas are the distribution network, the office buildings, and the fleet of vehicles used for maintenance and repairs. The distribution network accounts for the majority of energy consumption, followed by office buildings and vehicles.

7.1.1. Areas of Inefficiencies:

- **Distribution Network:** The energy consumption of the distribution network is higher than industry standards. The primary reasons for this are the aging infrastructure and lack of modern technology.
- **AT&C Loss:** it is still high (17.29%) as compared to national average of 15.0%. The main reason of high AT&C losses is billing efficiency, which is around 81.04%.
- **LT/HT Ratio:** Increasing HT lines can help in reducing both line losses and voltage drops. Efforts should be made to achieve a low LT/HT ratio, which would be very beneficial for improving efficiency of power distribution in the MePDCL.

7.1.2. Recommendations:

- The division wise excel sheet shall be automated via some software and the respective changes in the field in order to maintain the supply and meter faults, etc. shall be updated in the software on timely basis.
- 33/11kV Substation monitoring system shall be implemented. It shall monitor the loading of Transformer, Substations Battery and Feeders. It shall have the capability to show online data.
- Normal high loss distribution transformers should be replaced with star rating distribution transformer in phase manner.
- Normal conventional meter should be replaced with communicable prepaid smart meters.
- Augmentation of existing transformers at overloaded segments.
- Replacement or strengthening of conductor at overloaded segments is recommended.
- Recommended to provide aerial bunch conductor at theft prone area.
- Recommended to provide AMR meters for all HT installations.
- The DTR meter reading shall be AMR based and shall be increased. Proper Monitoring of the DTR meters shall be done.
- During off-peak periods, MePDCL is expected to minimize the no load losses by maintaining optimal loading of transformers by configuring its network in such a manner that reliability of supply is also not compromised.

Action Plan under Revamped Distribution Sector Scheme

A. Details of Infrastructure works under Loss Reduction (MePDCL)

Sr. No.	Activity	Unit	Quantity
1	HVDS/ Extension of HT Line and Reduction of LT Line		
A	New HT Line (21 no STP Poles, weasel conductor)	Ckm	1091.12
B	LT to HT conversion (17 nos STP Poles, weasel conductor) (Proposed in relatively flat Garo Hills)	Ckm	1926.03
C	LT AB Cable (3CX 50 Sqmm (168A)+1CX 35 Sqmm (insulated Messenger) + 1CX 16 Sqmm (Street light), 28 nos of Galvanized STP poles)	Ckm	1249.81
D	63 KVA substation (Supply cost of only Xmer 2.43 Lakhs)	Nos.	1234
E	100 KVA substation (Supply cost of only Xmer 3 Lakhs)	Nos.	1354
F	250 KVA substation (Supply cost of only Xmer 3.81 Lakhs)	Nos.	7
2	RECONDUCTORING/ AB CABLE		
A	33 kV reconductoring (6 nos of GI STP, 148 Sqmm MVCC Cable)	Ckm	244.85
B	11 kV reconductoring (5 nos of GI STP, 241 Sqmm MVCC Cable)	Ckm	1137.19
C	Replacement of LT bare conductor with LT AB Cable (3CX 50 Sqmm (168A)+ ICX 35 Sqmm (Insulated Messenger) - ICX 16 Sqmm (Street light)), 12 nos GI STP Poes	Ckm	2373.03
3	IT/OT works		
A	Implementation of Billing system/ other related software	Lumpsum	-
B	Other operating licenses (Perpetual license with 7 years of product warranty)	Lumpsum	-

B. Details of Smart Metering Works under RDSS

S. No	Type of Smart meter	Phase-I (By Dec'23)		Phase-II (By March'25)		Total Meters
		Nos	in %	Nos	in %	
1	Consumer Metering					
I.a	1 Ph smart Consumer meter	1,92,570	50%	1,92,568	50%	3,85,138
1.b	3 phase whole current smart	37,432	50%	37,430	50%	74,862
2	Smart DT Metering	5,705	50%	5,714	50%	11,419
3	Smart Feeder Metering	904	100%	0	0%	904
4	Smart Boundary Metering	420	100%		0%	420
Total		2,37,031	50%	2,35,712	50%	4,72,743

7.1.3. Cost-Benefit Analysis:

To determine the cost-effectiveness of the recommended measures, a cost-benefit analysis should be conducted. The cost of implementing the measures should be compared to the potential energy savings to determine the return on investment. This analysis will help the company prioritize the implementation of the recommended measures.

In conclusion, the energy audit of the electricity distribution company revealed several areas of inefficiencies in energy consumption. The recommended measures, including

upgrading the infrastructure, modernizing the HVAC systems, promoting employee awareness, and improving the fleet of vehicles, will help to improve energy efficiency and reduce energy consumption. Conducting a cost-benefit analysis will help the company to prioritize the implementation of these measures. Overall, the implementation of these measures will improve the company's energy efficiency, reduce energy consumption, and lower energy costs.

7.2. Summary of key findings – energy balance and losses

The Energy balance and losses of MePDCL for FY 2023-24 are as shown in the table below:

Table 39: Energy balance and losses

Energy Input Details	Formula	UoM	Value
Input Energy Purchase (From Generation Source)	A	MU	2632.53
Net input energy (at DISCOM Periphery after adjusting the transmission losses and energy traded)	B	MU	1769.42
Total Energy billed (is the Net energy billed, adjusted for energy traded))	C	MU	1434.00
Transmission and Distribution (T&D) loss	D	MU	335.43
Details	$E = D/B \times 100$	%	18.96%
Collection Efficiency	F	%	102.06%
Aggregate Technical & Commercial Loss	$G = 1 - \{(1-E) \times \text{Min}(F, 100\%)\}$	%	17.29%

7.3. Recommendations and best practices

- **Energy accounting**

The Bureau of Energy Efficiency (BEE), through Ministry of Power, Government of India, notified the regulations viz. 'Bureau of Energy Efficiency (Manner and Intervals for Conduct of Energy Audit in Electricity Distribution Companies) Regulations, 2021' vide Notification No.18/1/BEE/DISCOM/2021 dated 6th October 2021, and amendment issued thereof on 28th Oct. 2022. The extant regulations specify the following key aspects related to energy accounting and audit for electricity distribution companies.

- Intervals of time for conduct of periodic energy accounting and annual energy audit and report submission thereof.
- Pre-requisites for annual energy audit and periodic energy accounting
- Reporting requirements for annual energy audit and periodic energy accounting,
- Manner of annual energy audit and periodic energy accounting

- e) Prioritization and preparation of action plan and
- f) Structure of annual energy audit report

These regulations have been issued under the ambit of Energy Conservation Act, 2001, with an overall objective to reduce inefficiencies and losses in distribution sector thereby ensuring financial and economic viability of DISCOMs.

The regulation stipulates quarterly energy accounting by DISCOMs, through a certified Energy Manager and annual energy audit by an Independent Accredited Energy Auditor. The periodic energy accounting (quarterly) report needs to be submitted within 60 days of completion of the respective Quarter while the annual energy audit report should be submitted within four months of the completion of the financial year.

As per this regulation, An Energy Audit Cell (EAC) has been constituted headed by the Chef Engineer (Comm) vide notification no. MeECL/CA/GA/13/YR-22/16 dated 28th April 2022. The committee took necessary action to adhere with the regulation. In following table, status of the activities with timelines has been given

- **Loss reduction**

- Replacement of Electronic Meter to Smart Meters in Urban areas having loss more than 40%. In RDSS scheme.
- DT metering of Urban areas having loss more than 40%.
- Augmentation of DTR and PTRs
- Augmentation of Conductor of 33 & 11 KV lines.
- Construction of New Substations.
- Replacement of Bare LT Conductor with AB cable.
- Improving HT: LT ratio.

- **General Measures**

- Correction of DT Tagging of the LT consumers
- Correction of Feeder Tagging of the DTs.
- Boundary Meter installation to determine Energy Injection at the Sub-Division
- DT metering
- Feeder metering
- Unified Billing System
- Co-ordination with the Village Committee

- **Measure to improve Billing Efficiency**

- Check meter installation
- Replacement of faulty metering units (CT/PT) and Correction of CT/PT connection
- Accuracy Checking of doubtful meters
- Installation of Smart Meter

- Installation of meter at Unmetered consumers premises
- Swift replacement of faulty meters
- Checking Maximum Demand / LF and Contract Load enhancement

- **Measures to improve Collection Efficiency**
 - Disconnection Drive to recover outstanding dues
 - Outreach drive to appeal to the consumers for online payment OR timely payment to avoid penalty etc.
 - Introduction of Online Payment, UPI Payment & mobile application
 - Installation of Prepaid Smart Meter

- **Measure to reduce distribution (Technical) losses**
 - Substation augmentation
 - Replacement of Bare conductor by Covered Conductor in LT Line
 - Reconductoring
 - Conversion Long LT line to HT line
- **Monitoring and verification**
 - Internal Review

- **Energy conservation**
 - i. Awareness camps organised at Sub-Divisional level to advice consumers to use 5-star rated energy efficient appliances.
 - ii. Encouraging Consumers to opt roof top solar energy panels.

7.4. Action plan for line loss reduction

Following energy conservation Measures (ECMs) is adopted for line loss reduction

1. Installation of Smart Meters.
2. Installation of Automatic Power factor controller (Capacitor Bank).
3. System improvement & automation.
4. Improvement in metering system.
5. Replacing of conventional/ non star rated transformer into energy efficient transformers.
6. Replacement of all conventional mechanical energy meters with static digital energy meters having less power consumption and more accuracy.
7. Laying of AB cable in theft prone area where loss are in higher side.
8. HVD system to reduce low tension line losses.
9. Replacing worm out /Under sized conductors.
10. Increase in HT/LT Ratio.
11. Preventive & Periodic maintenance of line & transformer.

12. Load balancing of distribution transformers.
13. MIS Based periodic reporting of unit wise business parameters.
14. Strengthening of energy accounting infrastructure- 100% consumer metering.
15. GIS based asset mapping of all 33/11KV Substations, 11KV Lines and distribution transformers has been completed.
16. 11KV Feeder wise base line technical data i.e., length, Peak load, VR and technical loss calculated by algorithm & published in power BI.
17. Feeder wise baseline commercial loss is being collected by subtracting technical loss for total T&D loss.
18. Selection/priority of area must be made under:
 - I. Feeder having VR more than 15%.
 - II. Feeder having VR more than 9 to 15%.
 - III. Feeder having peak load more than 100 Amp. & length more than 30KM.
 - IV. High T&D loss feeder.
 - V. High commercial loss feeder.

7.5. Action plan for monitoring and reporting

1. Online monitoring of month wise energy data of various Division of MePDCL.
2. The division wise excel sheet shall be automated via some software and the respective changes in the field in order to maintain the supply and meter faults, etc. shall be updated in the software on timely basis.
3. 33/11kV Substation monitoring system shall be implemented. It shall monitor the loading of Transformer, Substations Battery and Feeders. It shall have the capability to show online data.
4. Most of the Feeder Meters are having communication facility through AMR and MRI Data (generally, more than feeder meter data is received through AMR or MRI.). The DTR meter reading shall be AMR based and shall be increased. Proper Monitoring of the DTR meters shall be done.
5. During off-peak periods, MePDCL is expected to minimize the no load losses by maintaining optimal loading of transformers by configuring its network in such a manner that reliability of supply is also not compromised.

7.6. Action plan for automated energy accounting

Automated energy accounting is a critical component of modern electricity distribution systems. It allows for accurate and efficient tracking of energy usage, which helps identify energy waste, reduce energy consumption, and improve billing accuracy. In this report, we

will outline an action plan for implementing automated energy accounting in an electricity distribution company.

Step 1: Evaluate Current Energy Accounting System

The first step is to evaluate the current energy accounting system to identify areas that need improvement. This will involve reviewing the current processes, systems, and data management practices. The evaluation should consider the following factors:

- Accuracy of billing and metering
- Timeliness of bill generation
- Data management practices
- Energy usage tracking capabilities
- Customer feedback and complaints

Step 2: Identify Automated Energy Accounting System Requirements

After evaluating the current energy accounting system, the next step is to identify the requirements for an automated energy accounting system. This will involve considering the following factors:

- Energy usage tracking capabilities
- Billing accuracy and timeliness
- Integration with existing systems
- Data management capabilities
- Scalability and flexibility

Step 3: Research and Select an Automated Energy Accounting System

Once the requirements are identified, the next step is to research and select an automated energy accounting system. This will involve reviewing available options and selecting a system that meets the identified requirements. The selected system should have the following features:

- Real-time energy usage tracking
- Automated billing and metering
- Data management and analysis capabilities
- Integration with existing systems
- User-friendly interface

Step 4: Develop Implementation Plan

After selecting an automated energy accounting system, the next step is to develop an implementation plan. This will involve determining the following:

- Timeline for implementation
- Resource requirements
- Roles and responsibilities
- Training requirements
- Data migration plan

Step 5: Implementation and Testing

Once the implementation plan is developed, the next step is to implement and test the automated energy accounting system. This will involve the following:

- Installation and configuration of the system
- Data migration from the old system to the new system
- User training
- System testing

Step 6: Rollout and Monitoring

After successful testing, the next step is to rollout the automated energy accounting system to all customers. This will involve communicating the changes to customers and ensuring a smooth transition. Once rolled out, the system should be continuously monitored to identify any issues and improve the system's performance.

In conclusion, implementing an automated energy accounting system can help an MePDCL improve billing accuracy, reduce energy waste, and enhance data management capabilities. The action plan outlined above provides a framework for implementing an automated energy accounting system in an electricity distribution company. By following this plan, the company can successfully implement the system and achieve its energy accounting goals.

Annexures

Annexure I - Introduction of Verification Firm

We A-Z Energy Engineers Pvt. Ltd. provides consultancy services in the areas of energy management while conducting Energy Audits in all segments of energy input. For conducting Detailed Energy Audits, Energy Audits under PAT (Mandatory and M&V), we have a pool of experienced BEE Accredited & Certified Energy Auditors, Electrical Engineers, Mechanical Engineers and Technicians having experience of more than 30 years. The Energy Audits is being carried out with sophisticated instruments namely Power-Analyzer, Flue Gas Analyzer, Ultra-sonic flow meter, Techo-meter, Anemometer, Hego-Meter, Digital Thermometer, Thermographic Camera's, Lux Meter, Leak detectors. Laser gun etc.

Objective

- To carry out and take ahead the business of Energy Efficiency and climate change including promotion and dissemination of energy efficient product and services.
- To disseminate the culture of safe manufacturing and Services through safety audits and trainings.
- To facilitate implementation of energy efficiency projects for Demand Side Measures including optimization of energy mix for industries, railways, building sector, lighting, HVAC etc.
- To facilitate implementation of schemes, programs and policies of central and state governments or its agencies applicable for enhancing energy efficiency.
- To provide consultancy services in the field of Clean Development Mechanism and Renewable Energy Certificate projects, Carbon Markets, Demand Side Management, Energy Efficiency, Climate change and other related areas.
- To identify and impart training to build the capacity of stakeholders in the field of Energy Efficiency and safe practices in Industry.
- To act as a resource center in the field of Energy Efficiency and take up the activities of Capacity Building Training and other related activities.

Vision

- To make use of energy sustainable.
- To create and sustain markets for energy efficiency in India
- To facilitate energy efficiency improvement through private sector investments in energy efficiency.

Mission

- To assist all stakeholders in implementing energy efficiency and realizing savings.
- To create awareness regarding merits of improvement of energy efficiency and safety practices in private and public sector.

We are Accredited Energy Auditor from BEE, also empanelled by BEE for PAT M & V Audits and Mandatory Energy Audit Projects. A-Z Energy Engineers Pvt. Ltd. has been short listed by Bureau of Energy Efficiency as an Energy Service Company (ESCO), it is an ISO 9001:2015 certified company. We have completed more than 1260 nos. projects, including 52 PAT projects

Dr. P.P. Mittal the Founder Director of A-Z Energy Engineers Pvt. Ltd. was awarded by Govt. of India in National Energy Conservation Award 2013, 2015 & 2016. MSME Ministry Govt. of India awarded "Best Services Providing Company" it was awarded by Hon'ble Prime Minister of India.

a) Name of the Firm

Name of Accredited Firm	Accredited Energy Auditor
A-Z energy Engineers Private Limited	Dr P.P Mittal (AEA 011)

b) Composition of Team

Sr.No.	Name	Qualification	Registration No	Experience (InYears)/Sector
1	Dr. P.P Mittal	Ph.D, MBA		+45 Years
2	Mr. Vipon Chanda	DISCOM Sector		30
3	Mr. V.P Sharma	B. Tech		32 Years
4	Mr. Alok Kumar Tiwari	B. Tech		7 Years
5	Mr. Pankaj Chauhan	Team Member		8 Years

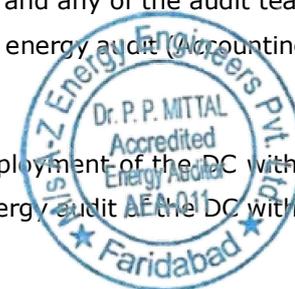
c) Registration No.

EmAEA 0024

d) Undertaking

We A-Z Energy Engineers Pvt. Ltd. hereby confirm that our AEA and any of the audit team member mentioned in this report has conduct mandatory annual energy audit (Accounting) for MePDCL, Shillong (hereafter called as DC).

We also confirm that none of our team member was in the employment of the DC within the previous four years, and was not involved in undertaking energy audit of the DC within the previous four years.




Authorized Signatory

Dr P.P Mittal

Annexure II - Minutes of Meeting with the DISCOM team

Minutes of Meeting with Meghalaya Power Distribution Corporation Limited (MePDCL), Shillong & A-Z Energy Engineers Pvt. Ltd., New Delhi

MePDCL

AZ Energy Engineers Pvt. Ltd.

AZ Energy Engineers audit team visited the site on 17th to 20th June' 24 and conduct the energy audit accounting with reference to the BEE and notification from the Bureau of Energy Efficiency dated 28th October 2022 for Conduct of Energy Audit (Accounting) in Electricity Distribution Companies).

Following are the key observations during audit.

- Filled in Proforma for FY 2023-24 was filled with Meghalaya Power Distribution Corporation Limited, & Audit team.
- MePDCL has provided the following documents for Purchase Energy, input/Billed energy. i.e. Internal Department sheet & UGO.
- MePDCL has provided details for action plan to reduce losses
- Verified T&D losses, AT&C losses & Collection Efficiency is 18.96%, 17.29% & 102.29% respectively based on the filled in proforma and verified source documents.
- During the audit field visit of substation was done and data attached in report. During the visit it was found that most of meters with modem were installed also daily basis logbook.

S. No	Data Required for Annual Energy Audit	Status
1	Complete filled in Proforma for the year 2023-2024 (Annually)	Provided
2	Supporting Data with Month wise breakup	Provided Month wise breakup
A	Purchase Energy	

S. No	Data Required for Annual Energy Audit	Status
B	Net Input in Discom	(Consumer, Units)
C	Billed Energy	
D	Revenue Demand	
E	Revenue Collected	
F	Energy Export to other	
G	Transmission loss calculation Methodology	Provided
H	Quarter report	Provided
3	Feeder wise input ,Billed Energy, T&D & AT&C losses	Provided
4	Action plan to reduce the T&D and AT&C losses	RDSS Plan Provided
5	Assets details matched with the proforma infrastructure sheets	Provided
6	Subsidy category Wise (BEE Guideline proforma)	NA
7	High Loss area T&D & AT&C action plan to reduce losses	Provided
8	DT Wise Losses	Under Progress
9	Feeder wise Losses	Provided


 Meghalaya Power Distribution Corporation Limited
 MeECL, Meghalaya
 BEE Reg. No: EA-23306




 MIS-A-Z Energy Engineers Pvt. Ltd.

Annexure III - Check List prepared by auditing Firm

An annual energy audit checklist is used to assess the energy efficiency of MePDCL based on equipment, appliances, design, and usage. Accredited Energy Auditor develops this checklist to identify opportunities for energy cost reduction and recommend solutions.

Documentary evidence for T & D system related data voltage-wise energy input data, sale data, feeder-wise loss data, collection efficiency etc.

▶ List of Measures adopted for energy conservation and quantity of energy saved with proper document support.

▶ Checking & verification of over loading of feeders at Substation level either by the study of SCADA system or by the log book

- Month wise input and billed energy.
 - T&D losses computation approach.
 - Un-metered energy consumption approach.
 - Internal field audit report of input and billed energy.
 - Performance of discom on distribution losses.
 - Outcome of internal filed audit.
 - Measures taken to reduce losses and improve losses.
 - Zone/circle/Division/Sub-division wise loss computation.
 - Reduction achieved, measures adopted for energy conservation and quantity of energy saved.
 - Report on distribution losses.
 - Write up on energy scenario.
 - Net Input Energy Computation Details.
 - Category wise consumer's details.
 - Category wise consumers connected load and % load
 - Bifurcation of Billed Energy (metered billed energy and unmetered billed energy).
- Write up on procedure followed Technical loss analysis.

Annexure IV - Brief Approach, Scope & Methodology for audit

Scope of annual energy accounting is as per guidelines and notification from Bureau of Energy Efficiency, New Delhi dated 6th October, 2021



Annexure V - Infrastructure Details

The infrastructure details of the DISCOM are as shown in the table below:

Table 40: Infrastructure details

Parameters	Total	Covered during in audit	Verified by Auditor in Sample Check	Remarks (Source of data)
Number of circles	7	7	Sample Checked	
Number of divisions	17	17	Sample Checked	
Number of sub-divisions	52	52	Sample Checked	
Number of feeders	526	526	Sample Checked	
Number of DTs	13477	13477	Sample Checked	
Number of consumers	690598	690598	Sample Checked	

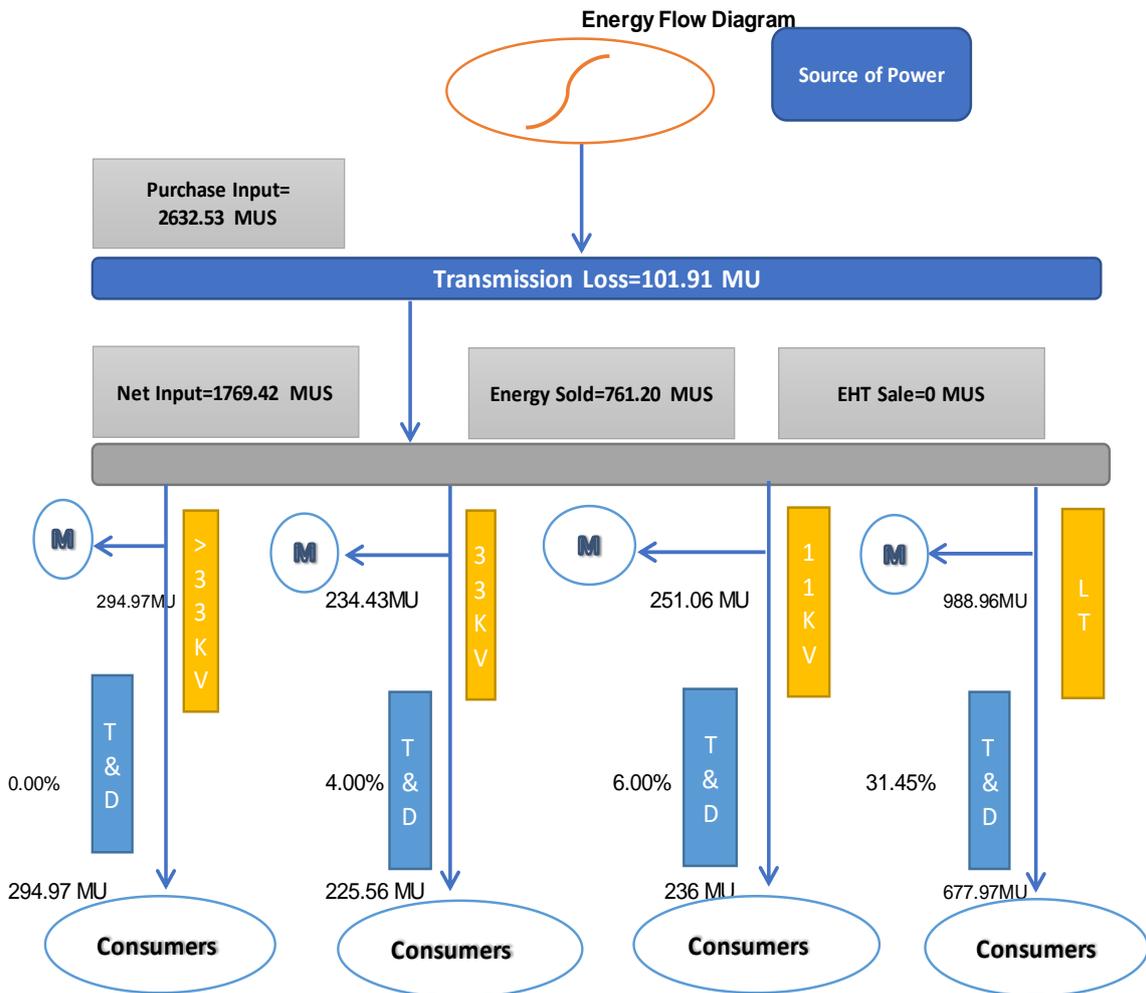
Table 41: Metering details

Parameters	66kV and above	33kV	11/22kV	LT
Number of conventional metered consumers	11	88	627	562679
Number of consumers with 'smart' meters			106	93922
Number of consumers with 'smart prepaid' meters			0	0
Number of consumers with 'AMR' meters			0	0
Number of consumers with 'non-smart prepaid Meters	0	0	0	14131
Number of unmetered consumers				19034
Number of total consumers	11	88	733	689766
Number of conventionally metered Distribution Transformers			3958	
Number of DTs with communicable meters			0	
Number of unmetered DTs			9519	
Number of total Transformers	36	164	13477	
Number of metered feeders	11	93	293	
Number of feeders with communicable meters	0	0	0	
Number of unmetered feeders		88	52	
Number of total feeders	11	181	345	
Line length(ctkm)	29384.128 (LT line)+ 17697.98 (11 kV line)+ 2797.40 (33kV line)			
Length of Aerial Bunched Cables	0			
Length of Underground Cables	1.86			

Annexure VI - Electrical Distribution System

- ▶ Energy flow between transmission and 220kV/132kV/33kV/20 kV/11kV/6.0 kV/3.3 kV incoming distribution feeders
- ▶ Energy flow between 132kV/33kV outgoing and 20 kV/11kV/6.6 kV/6.0 kV incoming feeders
- ▶ Energy flow between 11kV/6.0 kV/3.3 kV feeders and distribution transformers, or high voltage distribution system

Energy flow between distribution transformer, or high voltage distribution system to end-consumer, including ring main system. Energy flow between Feeder to end-consumer & Energy flow between 132kV/33kV/20 kV/11kV/6.0 kV/3.3 kV directly to consumer



Annexure VII - Power Purchase Details

a) Input Purchase Power for FY 2023-24

MePDCL, Shillong purchase the power from the MePDCL the month wise purchase units are shown in below table:

Table 42: Month wise power purchase

Sr. No.	Months	Energy (in Mus)
1	Apr-23	144.64
2	May-23	168.36
3	Jun-23	249.97
4	Jul-23	309.38
5	Aug-23	322.12
6	Sep-23	301.77
7	Oct-23	238.81
8	Nov-23	179.71
9	Dec-23	189.78
10	Jan-24	197.93
11	Feb-24	172.76
12	Mar-24	157.30
	Total	2632.53

b) Circle wise monthly Input Energy for FY 2023-24

The Month wise break up of input energy (MUs) parameter for all the circle is given below:

Table 43: Circle wise monthly input & Billed energy (MU)

Billed Unit	East Garo Hills Circle	Jaintia Hills Circle	Khasi Hills Circle	Ri Bhoi Circle	Shillong Circle	Tura Circle	West Garo Hills Circle	FEDCO	SAI	FY 2023-24
Apr-23	4.77	23.20	7.78	30.18	30.45	3.29	2.19	7.20	1.29	110.35
May-23	3.83	19.06	7.08	49.13	27.42	2.93	1.85	6.01	1.05	118.35
Jun-23	3.40	15.91	6.78	36.16	28.58	3.17	1.92	5.58	1.11	102.61
Jul-23	3.94	19.71	7.50	48.15	28.97	2.77	1.89	8.61	1.68	123.22
Aug-23	4.84	16.98	8.12	38.28	29.69	3.20	2.51	10.07	1.74	115.43
Sep-23	4.70	13.29	7.91	40.42	29.41	3.36	2.57	10.12	1.50	113.27
Oct-23	5.68	14.70	8.28	53.82	31.66	3.51	2.92	9.18	1.64	131.37
Nov-23	5.13	11.70	9.27	49.59	33.80	2.97	2.82	9.19	1.52	125.98
Dec-23	4.67	10.92	8.97	46.03	37.64	2.64	2.00	10.06	1.77	124.70
Jan-24	5.18	11.65	10.07	40.76	42.65	3.52	2.28	10.01	1.81	127.92
Feb-24	5.44	11.05	9.69	42.32	44.68	3.90	2.50	10.33	1.45	131.35
Mar-24	4.72	10.54	9.00	32.77	36.82	3.11	1.91	9.15	1.43	109.44
Grand Total	56.29	178.71	100.44	507.61	401.76	38.36	27.35	105.50	17.97	1434.00

Input Energy	East Garo	Jaintia	Khasi Hills	Ri-Bhoi	Shillong Circle	Tura	West Garo	FEDCO	SAI	Grand Total
Apr-23	8.62	22.32	9.05	48.10	30.26	4.29	3.48	7.20	1.29	134.60
May-23	5.86	17.68	8.51	49.23	30.74	4.29	3.00	6.01	1.05	126.37
Jun-23	6.53	17.94	8.56	39.69	29.97	4.41	2.97	5.58	1.11	116.76
Jul-23	9.34	23.52	11.14	54.27	32.68	5.39	4.82	8.61	1.68	151.45
Aug-23	10.66	22.81	12.26	50.30	33.63	5.70	4.87	10.07	1.74	152.02
Sep-23	9.67	18.72	11.32	44.33	32.19	5.74	4.19	10.12	1.50	137.78
Oct-23	10.45	20.39	12.83	58.25	36.30	5.42	4.92	9.18	1.64	159.37

Input Energy	East Garo	Jaintia	Khasi Hills	Ri-Bhoi	Shillong Circle	Tura	West Garo	FEDCO	SAI	Grand Total
Nov-23	9.31	18.17	13.79	57.17	40.84	4.78	3.94	9.19	1.52	158.70
Dec-23	10.59	20.75	15.72	51.53	48.05	5.63	3.72	10.06	1.77	167.83
Jan-24	11.51	19.94	16.63	45.05	51.38	6.19	4.71	10.01	1.81	167.22
Feb-24	9.14	17.52	14.65	39.24	48.65	4.67	4.36	10.33	1.45	150.01
Mar-24	8.66	17.02	14.58	43.35	44.26	4.14	4.71	9.15	1.43	147.31
Total	110.34	236.78	149.05	580.50	458.94	60.64	49.70	105.50	17.97	1769.42

Annexure IX - Category of service details (With Consumer and voltage-wise)

Type of consumers with different type of voltage & number of consumers are shown in below table:

Table 44: Category of service details

S.No	Type of Consumers	Category of Consumers	Voltage Level	No of Consumers	Total Consumption (In MU)
1	Domestic	HT/LT	LT/11/33	548160	503.2476346
2	Commercial	LT	LT	34049	87.32387641
3	Water Supply	LT	LT	468	7.772157803
4	Public Lighting	LT	LT	71	1.27233204
5	HT Water Supply	HT	11 or 33	81	38.97714237
6	HT Industrial	HT	11 or 33	208	537.7085661
7	Industrial (Small)	LT	LT	640	4.89257937
8	HT Commercial	HT	11 or 33	225	34.36540461
9	Mixed Load	HT/LT	LT, 11 or 33	2243	14.26540443
10	Government offices and department	HT/LT	LT, 11 or 33	208	80.4122358
11	Crematorium	LT	LT	1	0.186472
12	Agriculture	LT	LT	22	0.10100824
13	EV	LT	LT	2	0.001527
14	Distribution Franchisee-1_FEDCO	HT/LT	LT, 11 or 33	76403	105.496582
15	Distribution Franchisee-2_SAI	HT/LT	LT, 11 or 33	27817	17.973402
	Total			690598	1434.00

Annexure X - Field Verification data and reports

The field inspection details are shown in the below table:

Table 45: Field inspection details



33/11kV GIS substation at Jowai



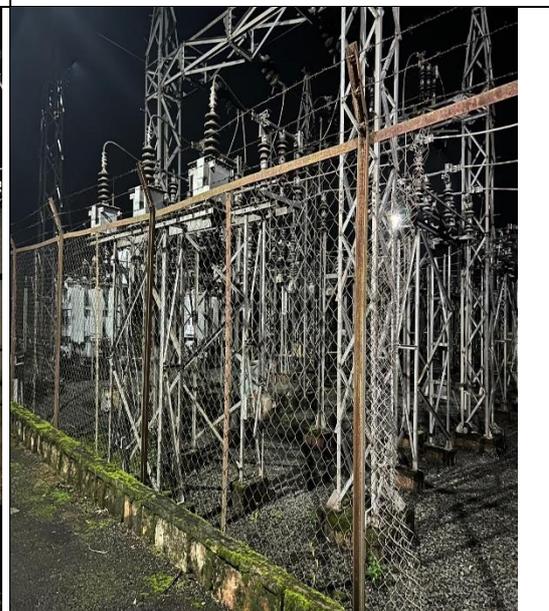
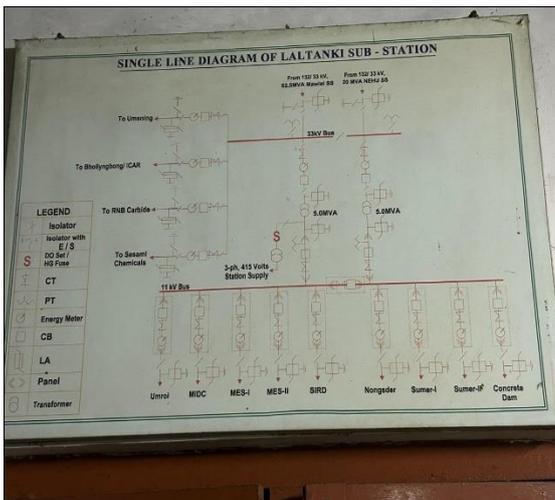
The above Photos of Chenkompara 33/11 KV new AIS substation. Work done-Control room building, PTR 2.5 MVA X 2 Nos, Switchyard electrical activity like Isolator,vcb,ct,pt ,LA ,earthing etc with CR Panel in CRB ,acdb, dcdb etc.33 KV incoMER and 11 KV out going 5 nos feeders .From o/g feeder 4 nos load charged



The above Photos of Babadam 33/11 KV new AIS substation. Work done-Control room building, PTR 2.5 MVA X 2 Nos, Switchyard electrical activity like Isolator, vcb, ct, pt, LA, earthing etc with CR Panel in CRB, acdb, dcdb etc. 33 KV incomer and 11 KV out going 5 nos feeders From o/g feeder 4 nos load charged.



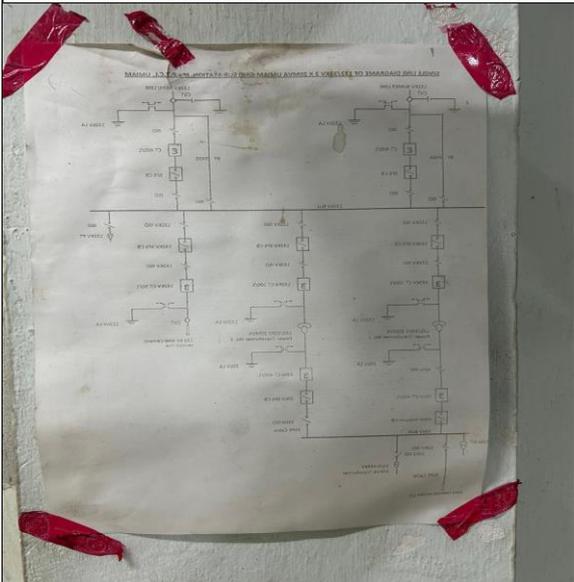
The above Photos of Damalgre 33/11 KV new AIS substation. Work done-Control room building, PTR 2.5 MVA X 2 Nos, Switchyard electrical activity like Isolator,vcb,ct,pt ,LA ,earthing etc with CR Panel in CRB ,acdb,dcdb etc.33 KV incomer feeder completed and 11 KV out going 2 nos feeders completed out of 4 nos feeder . Expect to complete by 30th August and to be load charged.



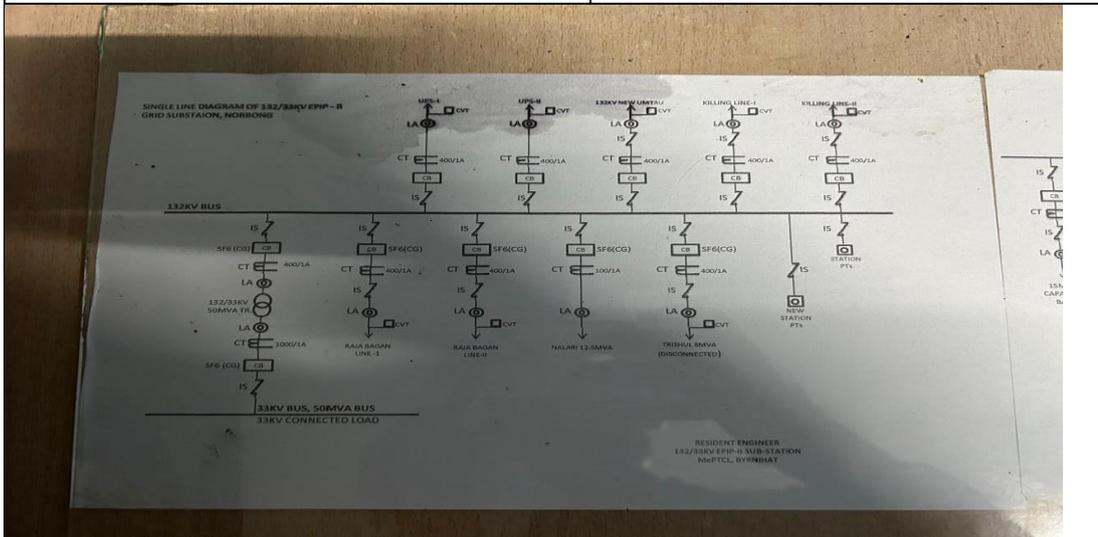
Umiam Substation 33/11 KV



METER DATA		METER DATA		METER DATA	
NO.	TYPE	NO.	TYPE	NO.	TYPE
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002	...	002	...	002	...
003	...	003	...	003	...
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Umiam Substation 132/33KV



EPIP

Annexure XI - List of documents verified with each parameter

The documents verified are listed in the below table:

Table 46: List of documents verified with each parameter

S. No	Data Required for Annual Energy Audit as per BEE regulation	Status	Remark
1	Complete filled in Proforma for the year 2023-2024 (Annually)	Provided	Data Attached
2	Supporting Data with Month wise breakup	Provided Month wise breakup	Data Attached
A	Purchase Energy		
B	Net Input in Discom		
C	Billed Energy		
D	Billed Revenue		
E	Revenue Collected		
F	Energy Export to other		
G	Transmission loss calculation Methodology	Calculated	Provided
3	Feeder wise input, Billed Energy, T&D & AT&C losses	Provided	Data Attached
4	Action plan to reduce the T&D and AT&C losses	Provided The various schemes	Action plan to reduce AT&C losses & payback of RDSS Schemes
5	Assets details matched with the proforma infrastructure sheets	Provided	Data Attached
6	Verified T&D and AT&C losses (Approved With Petition)	Petition provided	Data Attached
7	Energy Flow Diagram	Data Attached	Data Attached
8	Subsidy category Wise (BEE Guideline proforma)	Format Provided	NA
9	High Loss area T&D & AT&C action plan to reduce losses	Provided	Data Attached
10	Power Map	Provided	Data Attached

Annexure XII - Brief Description of Unit

The Meghalaya Energy Corporation Ltd. (MeECL) is a Government Company within the meaning of section 45 of the Companies Act, 2013, wholly owned by the Government of Meghalaya, incorporated under the Companies Act, 2013 in the year 2009 and inherited its business from the erstwhile Meghalaya State Electricity Board (MeSEB) in the year 2010. It has wholly owned three subsidiary Companies namely, Meghalaya Power Generation Corporation Ltd. (MePGCL), Meghalaya Power Transmission Corporation Ltd. (MePTCL) and Meghalaya Power Distribution Corporation Ltd. (MePDCL) responsible for Generation, Transmission and Distribution of Electricity respectively throughout the State as State Utilities.

The erstwhile Meghalaya State Electricity Board (MeSEB) was formed in the year 1975 after the formation of new State of Meghalaya from undivided State of Assam. The first Hydro Electric project in Meghalaya had started its operation in the year 1921, thereafter different Hydro Electric projects are being constructed throughout the State of Meghalaya utilising the natural water resources, efficient and experienced engineering wing and beautiful working environment of the State.

The detailed breakup of the year wise and category wise growth in No. of Consumers, Connected Load and Sales is tabulated below:

- **Category Wise Billed Energy**

S No.	Category of Consumer	2019-20	2020-21	2021-22	2022-23	2023-24
A. LT Category						
1	Domestic (DLT)	392.56	394.92	403.12	429.52	437.37
2	Commercial (CLT)	71.76	61.40	70.04	96.57	104.36
3	Industrial (ILT)	5.84	4.55	7.61	7.40	7.04
4	Agriculture (Ape)	0.31	0.14	0.31	0.20	0.20
5	Public Lighting (PL)	0.12	0.55	0.45	1.03	1.27
6	Water Supply (WSLT)	10.02	10.83	9.06	9.60	8.80
7	General Purpose	17.52	15.03	16.58	17.47	17.60
8	BPL	48.50	87.70	104.39	138.78	141.36
9	Crematorium (CRM)	0.19	0.15	0.14	0.18	0.19
	Sub-Total (A)	546.83	575.29	611.70	700.77	718.19
B. HT Category						
1	Domestic HT	24.13	17.39	21.38	22.18	21.93
2	Water Supply (WSHT)	31.84	28.11	32.81	35.37	39.40
3	Bulk Supply (BS)	84.86	69.01	75.32	77.86	81.19
4	Commercial (CHT)	27.43	20.03	24.27	30.96	35.18
5	Industrial (IHT)	160.74	65.81	76.79	133.25	114.54
6	Ferro Alloy	32.66	61.94	98.50	109.20	128.60
7	Special Tariff*		44.44	74.69	0.00	0
	Sub-Total (B)	361.65	306.72	403.75	408.81	420.84
C. EHT Category						
1	Industrial	51.68	43.64	50.23	263.36	96.16
2	Ferro Alloy	299.32	363.01	370.46	408.41	198.81
3	Special Tariff*		37.79	113.51	0.00	
	Sub-Total (C)	351.00	444.44	534.20	671.77	294.97
	Grand Total	1259.48	1326.45	1549.65	1781.35	1433.99

- **Category Wise Number of Consumer**

S No.	Category of Consumer	2019-20	2020-21	2021-22	2022-23	2023-24
A. LT Category						
1	Domestic (DLT)	327754	355725	351825	392431	398627
2	Commercial (CLT)	28818	28800	28639	37267	37083
3	Industrial (ILT)	695	700	556	784	732
4	Agriculture (Ape)	112	28	13	22	23
5	Public Lighting (PL)	57	60	50	78	71
6	Water Supply (WSLT)	436	417	365	476	505
7	General Purpose	2421	2419	2283	2661	2499
8	BPL	141677	207266	224331	247426	250171
9	Crematorium (CRM)	1	1	1	1	1
	Sub-Total (A)	501971	595416	608063	681146	689712
B. HT Category						
1	Domestic HT	86	98	112	131	130
2	Water Supply (WSHT)	27	36	52	70	88
3	Bulk Supply (BS)	208	196	225	230	228
4	Commercial (CHT)	133	131	148	230	228
5	Industrial (IHT)	130	117	131	206	193
6	Ferro Alloy	2	2	3	3	4
7	Special Tariff*		6	6		
	Sub-Total (B)	586	586	677	870	871
C. EHT Category						
1	Industrial	4	5	5	10	10
2	Ferro Alloy	4	4	4	4	3
3	Special Tariff*		3	3		
	Sub-Total (C)	8	12	12	14	13
	Grand Total	502565	596014	608752	682030	690596

- **Category Wise Connected Load in (MW)**

S No.	Category of Consumer	2019-20	2020-21	2021-22	2022-23	2023-24
A. LT Category						
1	Domestic (DLT)	417.41	525.49	551.10	590.68	600.80
2	Commercial (CLT)	72.60	94.51	87.59	109.56	125.41
3	Industrial (ILT)	11.35	11.20	12.25	9.90	11.44
4	Agriculture (Ape)	0.28	0.24	0.34	0.12	0.22
5	Public Lighting (PL)	0.43	1.67	1.86	1.54	1.41
6	Water Supply (WSLT)	6.86	9.80	7.51	6.89	7.64
7	General Purpose	15.27	18.17	18.70	18.99	18.28
8	BPL	50.39	155.61	170.95	208.64	205.05
9	Crematorium (CRM)	0.15	0.15	0.14	0.15	0.14
	Sub-Total (A)	574.75	816.85	850.45	946.47	970.39

B. HT Category						
1	Domestic HT	18.47	22.25	24.30	23.11	22.67
2	Water Supply (WSHT)	8.37	8.45	10.80	14.49	16.60
3	Bulk Supply (BS)	45.89	46.13	51.94	53.23	50.08
4	Commercial (CHT)	29.37	20.43	22.34	27.59	31.97
5	Industrial (IHT)	114.99	40.73	90.09	136.43	119.45
6	Ferro Alloy	14.91	14.91	18.91	18.91	26.02
7	Special Tariff*	0.00	25.60	25.60	0.00	0.00
	Sub-Total (B)	232.01	178.50	243.99	273.76	266.78
C. EHT Category						
1	Industrial	25.70	25.70	32.00	55.24	95.35
2	Ferro Alloy	56.50	56.50	56.50	65.40	49.05
3	Special Tariff*	0.00	23.24	23.24	0.00	0.00
	Sub-Total (C)	82.20	105.44	111.74	120.64	144.40
	Grand Total	888.96	1100.79	1206.17	1340.87	1381.57

* Special Tariff Category has been discontinued.

MePDCL has been making efforts to reduce the T&D Losses and AT&C losses in the state. The past 5 years' performance in terms of AT&C and Distribution Losses is tabulated below:

- Commercial Parameters of MePDCL**

	2019-20	2020-21	2021-22	2022-23	2023-24*
AT&C Loss	32.07%	29.67%	25.95%	24.05%	17.29%
T&D Loss	29.88%	26.75%	21.76%	16.47%	18.96%
Billing Efficiency	73.60%	72.96%	75.23%	81.04%	83.53%
Collection Efficiency	90.90%	96.27%	100.23%	86.39%	102.06%

*tentative

Further, the energy demand in terms of MU and Peak demand in MW of the state over the past years is tabulated below;

Peak Demand and Energy Requirement of State

Year	Peak Demand (MW)	Energy Requirement (MU)
2017-18	369	1557
2018-19	374	1957
2019-20	371	2112
2020-21	384	2031
2021-22	408	2256
2022-23	404	2237
2023-24	405	2236

MePDCL is having a total long term power purchase arrangement with state generating stations and central generating stations. These arrangements are mix of hydro, coal based and gas based generating stations. The current allocation from Central and State Generating Stations are tabulated below:

- Sector Wise Long Term Power Arrangements of MePDCL**

Sector	Allocation (MW)
State	367.50
Central	350.10
Total	717.60

- Technology Wise Long Term Power Arrangement of MePDCL**

Technology	Allocation (MW)
Coal Based	88.00
Gas Based	130.30
Hydro	499.30
Total	717.60

The detailed breakup of the in-house generation and the allocations from the Central Generating Stations is tabulated below:

SI No	Name of Station	Allocation (MW)
A	MePGCL	
1	Umiam -I	36.0
2	Umiam -II	20.0
3	Umiam -III	60.0
4	Umiam -IV	60.0
5	MLHEP	126.0
7	Sonapani	1.5
8	New Umtru	40.0
9	Ganol	22.5
10	Lakroh	1.5
	Sub-Total MePGCL	367.5
B	NEEPCO	
1	Kopili	35.1
2	Kopili-Ext	3.5
3	Khandong	8.5
4	Ranganadi	47.1
5	Doyang	8.7

SI No	Name of Station	Allocation (MW)
6	AGBPP	34.7
7	AGTPP CC	16.6
8	Pare	14.0
9	Kameng	15.0
	Sub-Total NEEPCO	183.11
C	OTPC-Palatana	78.99
D	NTPC	
1	BTPS	88.00
	Sub-Total NTPC	88.00
	Total	717.60

With effect from 1st April, 2012, the respective assets & liabilities including all rights, obligations and contingencies of the three subsidiary companies of MeECL has been transferred to and vest with the respective Subsidiary companies from MeECL.

GOVERNMENT NOTIFICATION

Pursuant to the Government of Meghalaya notification on 'The Meghalaya Power Sector Reforms Transfer Scheme, 2010', the Meghalaya Energy Corporation Ltd. (MeECL) was incorporated on 14th September, 2009 as holding company of Meghalaya Power Distribution Corporation Ltd. (MePDCL), Meghalaya Power Transmission Corporation Ltd. (MePTCL) and Meghalaya Power generation Corporation Ltd. (MePGCL).

STATE OF AFFAIRS OF MEECL

Pursuant to the Amendment notification on 'The Meghalaya Power Sector Reforms Transfer Scheme, 2010' dated 31st March, 2012, the MeECL had carried all the business activities of its own and of its three subsidiary companies during the financial years 2010-11 and 2011-12.

With effect from 1st April, 2012, the respective assets & liabilities including all rights, obligations and contingencies of the three subsidiary companies of MeECL has been transferred to and vest with the respective subsidiary companies from MeECL.

FUNCTIONS OF MEECL

The MeECL is a Government Company within the meaning of section 45 of the Companies Act, 2013. Your Company is 100% owned by the Government of Meghalaya.

The MeECL is comprising of all the assets, liabilities including all rights, obligations, contingences and proceedings belonging/related to the common activities or not specifically associated with the generation, transmission and distribution activities.

Inter-alia, the MeECL is performing the following major activities:

- i) HR & Administration of the MeECL and its three subsidiaries.
- ii) Maintaining the provident Fund, Pension Fund, Gratuity Fund etc. for employees of MeECL

and its three subsidiaries.

- iii) Corporate Social Responsibility
- iv) Preparation of Accounts and Fund Management
- v) Commercial, Material Management and Planning & Design for MeECL and of subsidiary companies.

STATE OF AFFAIRS OF MEGHALAYA POWER DISTRIBUTION CORPORATION LTD. (MEPDCL)

The MePDCL is a Government Company within the meaning of Section 45 of the Companies Act, 2013. The present share-holding is 100% owned by the Meghalaya Energy Corporation Ltd. (MeECL), a Government of Meghalaya Enterprise.

Your company is licensee mandated with distribution of power to consumers within the State of Meghalaya. Your Company has started carrying its business operations with effect from 1st April, 2012.

The MePDCL has commenced filing its separate tariff petition before the Meghalaya State Electricity Regulatory Commission (MSERC) with effect from 1st April, 2013.

REGULATORY FRAMEWORK: TARIFF FIXATION/DETERMINATION

The Meghalaya State Electricity Regulatory Commission is a statutory body established in accordance with the provisions of the Electricity Act, 2003 and is responsible for licensing transmission, distribution and trade of electricity in the State. The other important responsibilities of the MSERC include; fixation of tariff, regulation of procurement and creation of a consumer friendly grievance settlement framework.

CONSUMER ADVOCACY

The Electricity Act, 2003 provides for active participation of consumers in all areas of generation, transmission and distribution of electricity. The regulatory mechanism created by this legislation has been deliberately designed to receive inputs from consumers and citizens.

From the framing of regulations to the stage of licensing utilities and fixing tariff, the Act requires that the people be provided an opportunity to participate in decision making. In fact the Act even requires the Commission disseminate knowledge among consumers about the means by which they can involve themselves and make the regulatory function sensitive to the needs of the community at large.

Given the importance of electricity in our daily lives the Commission expects that consumers and citizens will participate more actively in determining the contours of the service they expect from their service providers.

Beyond the framework already in place, the Commission being a quasi-judicial body with powers of a civil court, functions transparently. This implies that its regulatory activities are carried out in a transparent manner and all deliberations and decisions are open to the public. To ensure that consumers and their interests are not lost sight of; the Act authorises the Commission to even appoint, if necessary, suitable individuals or institutions to effectively represent the consumers.

Annexure XIII - List of Parameters arrived through calculation or formulae with list of documents as source of data

Ideally, reduction of technical losses should be the parameter for evaluation of performance of Discoms sector. However, the technical losses of the Discoms are not available and it involves a cumbersome process to calculate the technical losses, which varies based on various factors like loading pattern etc.

Now, only the T&D losses and AT&C losses are available as the performance parameter for achieving energy efficiency by DISCOMs.

It was decided that out of the two parameters, T&D loss parameter seems to be appropriate parameter which reflects energy savings to a greater extent as compared to AT&C losses

Table 47: Formulas used to derive the parameters

Parameter	Formula	Data Source
AT&C Losses	$\{1 - (\text{Billing Efficiency} \times \text{Collection Efficiency})\} \times 100$	
T& D Losses	$\{1 - (\text{Total energy Billed} / \text{Total energy Input in the system})\} \times 100$	
Billing efficiency	Total unit Billed/ Total unit Inputs	Collection efficiency
Collection efficiency	Revenue collected / Amount Billed	

Annexure XIV - Detailed Formats

General Information			
1	Name of the DISCOM	Meghalaya Power Distribution Corporation Limited (MePDCL)	
2	i) Year of Establishment	18.12.2009	
	ii) Government/Public/Private	Government Enterprise	
3	DISCOM's Contact details & Address		
i	City/Town/Village	Lum Jingshai, Short Round Road	
ii	District	East Khasi Hills	
iii	State	Meghalaya	Pin 793001
iv	Telephone	(0364) 2590610	Fax (0364) 2590355
4	Registered Office		
i	Company's Chief Executive Name	Shri Sanjay Goyal, IAS	
ii	Designation	Chairman Cum Managing Director	
iii	Address	Lum Jingshai, Short Round Road	
iv	City/Town/Village	Shillong	P.O. Shillong GPO
v	District	East Khasi Hills	
vi	State	Meghalaya	Pin 793001
vii	Telephone	(0364) 2590610	Fax (0364) 2590355
5	Nodal Officer Details*		
i	Nodal Officer Name (Designated at DISCOM's)	Shri. SS Kharmih	
ii	Designation	Chief Engineer (Comm.) i/c	
iii	Address	Lum Jingshai, Short Round Road	
iv	City/Town/Village	Shillong	P.O. Shillong GPO
v	District	East Khasi Hills	
vi	State	Meghalaya	Pin 793001
vii	Telephone	9436164780	Fax
6	Energy Manager Details*		
i	Name	Santanu Mandal	
ii	Designation	Energy Manager	Whether EA or EM EM
iii	EA/EM Registration No.	23306	
iv	Telephone	Fax	
v	Mobile	9851628686	E-mail ID cem.meecl@gmail.com
7	Period of Information		
	Year of (FY) information including Date and Month (Start & End)	1st April, 2023 - 31st March, 2024	

ds
Energy Manager,
MeECL, Meghalaya
BEE Reg. No: EA-23306

ds
Chief Engineer (Commercial)
Meghalaya Power Distribution Corporation Limited
Lumjingshai, Shillong - 793001

Performance Summary of Electricity Distribution Companies		1st April, 2023 - 31st March, 2024
1	Period of Information Year of (FY) information including Date and Month (Start & End)	
2	Technical Details	
(a)	Energy Input Details	
(i)	Input Energy Purchase (From Generation Source)	2632.53 Million kwh
(ii)	Net input energy (at DISCOM Periphery after adjusting the transmission losses and energy traded)	1769.42 Million kwh
(iii)	Total Energy billed (is the Net energy billed, adjusted for energy traded))	1434.00 Million kwh
(b)	Transmission and Distribution (T&D) loss Details	335.43 Million kwh
	Collection Efficiency	18.96% %
(c)	Aggregate Technical & Commercial Loss	102.06% %
		17.29% %

I/We undertake that the information supplied in this Document and Pro-forma is accurate to the best of my knowledge and if any of the information supplied is found to be incorrect and such information result into loss to the Central Government or State Government or any of the authority under them or any other person affected, I/we undertake to indemnify such loss.

Authorised Signatory and Seal

Name of Authorised Signatory 
Name of the DISCOM: Chief Engineer (Commercial)
Meghalaya Power Distribution Corporation Limited
Full Address:- Lumjingshai, Shillong - 793001

Signature:- 
Name of AEA*: Energy Minister,
MeECL, Meghalaya
Registration Number: Reg. No: EA-23306

Seal

Form-Details of Input Infrastructure						
1	Parameters	Total	Covered during in audit	Verified by Auditor in Sample Check	Remarks (Source of data)	
i	Number of circles		7			
ii	Number of divisions		17			
iii	Number of sub-divisions		52			
iv	Number of feeders		582			
v	Number of DTs		13477			
vi	Number of consumers		690598			
2	Parameters	66kV and above	33kV	11/22kV	LT	
a. i.	Number of conventional metered consumers	11	88	627	562679	
ii	Number of consumers with 'smart' meters			106	93922	
iii	Number of consumers with 'smart prepaid' meters			0	0	
iv	Number of consumers with 'AMR' meters			0	0	
v	Number of consumers with 'non-smart prepaid' meters	0	0	0	14131	
vi	Number of unmetered consumers				19034	
vii	Number of total consumers	11	88	733	689766	
b. i.	Number of conventionally metered Distribution Transformers		3958			
ii	Number of DTs with communicable meters		0			
iii	Number of unmetered DTs		9519			
iv	Number of total Transformers		13477			
c. i.	Number of metered feeders	11	93	293		
ii	Number of feeders with communicable meters	0	0	0		
iii	Number of unmetered feeders		110	75	0.796195652	
iv	Number of total feeders	11	203	368	0.458128079	
d.	Line length (ct km)		29384.128 (LT line)+ 17697.98 (11 kV line)+ 2797.40 (33kV line)			
e.	Length of Aerial Bunched Cables		0			
f.	Length of Underground Cables		1.86			


 Energy Manager,
 MeEGCL, Meghalaya
 BEE Reg. No: EA-23306

3	Voltage level	Energy Purchase Particulars	MU	Reference	Remarks (Source of data)
i	66kV and above	Long-Term Conventional Medium Conventional Short Term Conventional Banking Long-Term Renewable energy Medium and Short-Term RE Captive, open access input Sale of surplus power Quantum of inter-state transmission loss Power procured from inter-state sources Power at state transmission boundary Long-Term Conventional Medium Conventional Short Term Conventional Banking Long-Term Renewable energy Medium and Short-Term RE Captive, open access input Sale of surplus power Quantum of intra-state transmission loss Power procured from intra-state sources Input in DISCOM wires network Renewable Energy Procurement Small capacity conventional/ biomass/ hydro plants Procurement Captive, open access input Renewable Energy Procurement Small capacity conventional/ biomass/ hydro plants Procurement Sales Migration Input Renewable Energy Procurement Sales Migration Input Energy Embedded within DISCOM wires network Total Energy Available/ Input Energy Sales Particulars	1,476.125 194.239 71.795 74.306 1,742.159 1,667.853 890.376 27.602 890.376 2,530.627 0.000 2,530.627 MU 677.974	Includes input energy for franchisees Includes power from bilateral/ PX/ DEEP Any power wheeled for any purchase other than sale to DISCOM. Does not include input for franchisee. As confirmed by SIDC, RLDC etc Based on data from Form 5 MePGCL	Central Generating Station IEX & DSM
4	Voltage level			Reference	
i	LT Level	DISCOM' consumers Demand from open access, captive Embedded generation used at LT level Sale at LT level Quantum of LT level losses Energy input at LT level DISCOM' consumers Demand from open access, captive Embedded generation at 11 kV level used Sales at 11 kV level Quantum of Losses at 11 kV Energy input at 11 kV level	677.974 310.986 988.959 235.998 235.998 15.064 251.062	Include sales to consumers in franchisee areas, unmetered consumers Non DISCOM's sales Demand from embedded generation at LT level Include sales to consumers in franchisee areas, unmetered consumers Non DISCOM's sales Demand from embedded generation at 11kV level	
ii	11 kV Level				

iii	33 kV Level	DISCOM' consumers	225.056	Include sales to consumers in franchisee areas, unmetered consumers	
		Demand from open access, captive Embedded generation at 33 kV or below level		Non DISCOM's sales	
		Sales at 33 kV level	225.056	This is DISCOM and OA demand met via energy generated at same voltage level	
		Quantum of Losses at 33 kV	9.377		
		Energy input at 33kV Level	234.433		
		DISCOM' consumers	294.969	Include sales to consumers in franchisee areas, unmetered consumers	
		Demand from open access, captive		Non DISCOM's sales	
		Cross border sale of energy	761.204		3.10%
		Sale to other DISCOMs			2.24%
		Banking			
		Energy input at > 33kV Level	1,056.173		
		Sales at 66kV and above (EHV)	1,056.173		
		Total Energy Requirement	2,530.627		
		Total Energy Sales	2,195.200		
Energy Accounting Summary					
5		DISCOM	Input (in MU)	Sale (in MU)	Loss (in MU)
i	LT		988.9593162	677.9735904	310.9857258
ii	11 kv		251.0616559	235.9979566	15.06369935
iii	33 kv		234.4332763	225.0559452	9.37733105
iv	> 33 kv		294.9688326	294.9688326	0
6		Open Access, Captive	Input (in MU)	Sale (in MU)	Loss (in MU)
i	LT				
ii	11 kv				
iii	33 kv				
iv	> 33 kv				
				0	#DIV/0!

Loss Estimation for DISCOM	
T&D loss	335.43
T&D loss (%)	18.96%


Energy Manager,
MeECL, Meghalaya
 SEE Reg. No: EA-23306

Details of Division Wise Losses (See note below)**

Period From 1st April, 2023 - 31st March, 2024

Division Wise Losses

S.No	Name of circle	Circle code	Name of Division	Consumer profile										Energy parameters (MU)						Losses			Commercial Parameter			AT & C loss (%)
				Consumer category	No of connection metered (Nos)	No of connection Un-metered	Total Number of connection	% of number of connection	Connecte d Load metered (MW)	Connecte d Un-metered (MW)	Total Connecte d Load (MW)	% of connecte d load	Input energy (MU)	Metered energy	Unmetered/assess ment energy	Total energy	% of energy consumption	T&D loss (MU)	T&D loss (%)	Billed Amount in Rs. Crore	Collected in Rs. Crore	Collection Efficiency				
																							Losses			
1	Shillong Distribution Circle		Shillong Distribution Circle	Residential	120019	4	120019	88%	267.8307	0.004	267.8347	68%	226.4649	0.003265	226.4682	56%	147.5054	150.4304	101.98%							
				Agriculture	1	0	1	0%	0.0016	0	0.0016	0%	0.0016	0	0.0016	0%	0.001734	0.039166	2258.56%							
				Commercial	14998	0	14998	11%	52.39488	0	52.39488	3%	458.9401	0	48.87637	0	50.87637	12%	39.45666	39.32688	99.67%					
				Commercial	134	0	134	0%	22.76501	0	22.76501	6%	58.80493	0	58.80493	15%	54.91985	30.62331	55.76%							
				Others	976	0	976	1%	50.18941	0	50.18941	13%	75.61027	0	75.61027	19%	70.07514	97.42199	139.03%							
	Sub-total			136124	4	136128	100%	393.188	0.004	393.192	100%	401.7581	0.003265	401.7613	100%	311.9588	317.8417	101.89%			11%					
2	Khasi Hills Distribution Circle		East Khasi Hills Distribution Division	Residential	65210	2030	65210	96%	77.53775	2.04	79.57775	83%	35.57043	0.742315	36.31274	71%	22.49355	24.76225	110.09%							
				Agriculture	1	0	1	0%	0.02	0	0.02	0%	0	0	0	0%	0	0	0	0.00%						
				Commercial	2350	0	2350	3%	9.706099	0	9.706099	10%	68.58909	0	6.470912	0	6.470912	13%	6.05148	6.380776	105.44%					
				Commercial	8	0	8	0%	2.3886	0	2.3886	2%	5.798274	0	5.798274	11%	5.666091	4.947917	87.33%							
				Others	244	0	244	0%	3.934331	0	3.934331	4%	2.887865	0	2.887865	6%	2.956899	4.214873	142.54%							
	Sub-total			67813	2030	69843	100%	93.58678	2.04	95.62678	100%	50.72748	0.742315	51.46979	100%	17.11929	40.30582	108.44%			19%					
3	Khasi Hills Distribution Circle		West Khasi Hills Distribution Division	Residential	57463	452	57915	95%	65.98076	0.452	66.43276	80%	27.23749	0.128032	27.36553	71%	18.07269	17.67793	97.82%							
				Agriculture	1	0	1	0%	0.03	0	0.03	0%	0.003824	0	0.003824	0%	0.005535	0.005559	100.43%							
				Commercial	2933	0	2933	5%	11.37389	0	11.37389	14%	55.83588	0	6.880263	0	6.880263	18%	6.660762	6.72273	100.92%					
				Commercial	23	0	23	0%	2.259405	0	2.259405	3%	2.789893	0	2.789893	7%	3.376352	1.826936	54.09%							
				Others	253	0	253	0%	2.56296	0	2.56296	3%	1.353261	0	1.353261	4%	1.320154	4.091104	309.90%							
	Sub-total			60673	452	61125	100%	82.20701	0.452	82.65901	100%	38.26473	0.128032	38.39277	100%	17.44311	30.3232	103.02%			29%					
4	Khasi Hills Distribution Circle		South Khasi Hills Distribution Division	Residential	16092	28	16120	96%	20.822	0.028	20.85	88%	8.58462	0.013661	8.598281	81%	5.530343	3.709839	67.08%							
				Agriculture	0	0	0	0%	0	0	0	0%	0	0	0	0%	0	0	0	0.00%						
				Commercial	605	0	605	4%	1.539	0	1.539	7%	24.62382	0	0.761351	0	0.761351	7%	0.783007	1.116259	142.56%					
				Commercial	0	0	0	0%	0	0	0	0%	0.366477	0	0.366477	3%	0.368457	0	0.00%							
				Others	74	0	74	0%	1.2068	0	1.2068	5%	0.885266	0	0.885266	8%	0.866197	1.953468	225.52%							
	Sub-total			16771	28	16799	100%	23.5678	0.028	23.5958	100%	10.56771	0.114442	10.58137	100%	14.04245	6.779565	89.82%			61%					
5	Ri-Bhoi Distribution Circle		Umiam Distribution Division	Residential	28837	301	29138	95%	34.9948	0.301	35.2958	49%	24.30015	0.114442	24.41459	28%	13.37969	11.47262	85.40%							
				Agriculture	2	0	2	0%	0.005	0	0.005	0%	0.000582	0	0.000582	0%	0.000471	0.000325	69.02%							
				Commercial	1314	0	1314	4%	5.2444	0	5.2444	7%	123.5077	0	3.712679	0	3.712679	4%	3.076099	3.696025	120.15%					
				Commercial	56	0	56	0%	25.54299	0	25.54299	36%	49.69913	0	49.69913	57%	36.90938	39.53721	107.12%							
				Others	122	0	122	0%	5.3485	0	5.3485	7%	9.450624	0	9.450624	11%	8.420815	10.08342	119.74%							
	Sub-total			30331	301	30632	100%	71.13569	0.301	71.43669	100%	24.62382	0.114442	24.73761	100%	14.04245	6.779565	89.82%			61%					
6	Ri-Bhoi Distribution Circle		Nongpoh Distribution Division	Residential	22588	242	22830	94%	26.2049	0.242	26.4469	79%	14.33376	0.123034	14.45679	76%	6.178646	6.736881	84.27%							
				Agriculture	2	0	2	0%	0.017	0	0.017	0%	0.021081	0	0.021081	0%	0.009809	0.009297	94.78%							
				Commercial	1225	0	1225	5%	4.238201	0	4.238201	13%	21.30526	0	3.034611	0	3.034611	16%	2.65288	2.866382	107.54%					
				Commercial	6	0	6	0%	0.4959	0	0.4959	1%	0.515114	0	0.515114	3%	0.637588	0.64054	100.46%							
				Others	151	0	151	1%	2.176	0	2.176	7%	0.940949	0	0.940949	5%	1.360089	1.645524	120.99%							
	Sub-total			23972	242	24214	100%	33.132	0.242	33.374	100%	18.84551	0.123034	18.96854	100%	2.336715	11.89882	93.93%			16%					
7	Ri-Bhoi Distribution Circle		Byrnihat Distribution Division	Residential	5858	1	5859	86%	7.7663	0.001	7.7673	4%	6.65564	0	6.65564	2%	3.886526	3.653886	94.01%							
				Agriculture	0	0	0	0%	0	0	0	0%	0	0	0	0%	0	0	0	0.00%						
				Commercial	787	0	787	12%	4.0965	0	4.0965	2%	435.6895	0	4.102594	0	4.102594	1%	3.749825	4.534355	120.92%					
				Commercial	116	0	116	2%	201.3366	0	201.3366	94%	390.4617	0	390.4617	97%	260.4796	271.1621	104.10%							
				Others	26	0	26	0%	0.3221	0	0.3221	0%	0.144155	0	0.144155	0%	0.177717	0.192239	108.17%							
	Sub-total			6787	1	6788	100%	213.5215	0.001	213.5225	100%	401.3641	0	401.3641	100%	34.32548	279.5426	104.19%			4%					
8	Jaintia Hills Distribution Circle		Khehriat Distribution Division	Residential	23574	135	23709	92%	27.1523	0.135	27.2873	28%	20.86146	0.062886	20.92435	17%	11.62287	10.39308	89.42%							
				Agriculture	0	0	0	0%	0	0	0	0%	0	0	0	0%	0	0	0	0.00%						
				Commercial	1776	0	1776	7%	7.3012	0	7.3012	7%	148.81	0	5.414157	0	5.414157	4%	4.847134	5.050692	104.20%					
				Commercial	63	0	63	0%	59.87813	0	59.87813	61%	93.65229	0	93.65229	78%	90.79888	93.95481	103.45%							
				Others	110	0	110	0%	4.1731	0	4.1731	4%	0.76971	0	0.76971	1%	0.788873	1.726406	233.65%							
	Sub-total			23574	135	23709	100%	213.5215	0.135	213.5225	100%	401.3641	0	401.3641	100%	28.04953	279.5426	104.19%			4%					

9	Sub-total	Jaintia Hills Distribution Circle	Residential	25523	135	25658	100%	98.50473	0.135	98.63973	100%	148.81	120.6976	0.062886	120.7605	120.7605	100%	28.04953	19%	108.0078	111.105	102.87%	17%	
			Agricultura	24855	1	24856	92%	36.4544	0.001	36.4554	0	0	0%	49.5248	24.74434	0	24.74434	70%	14.2673	29%	0	16.69768	109.46%	0.00%
10	Sub-total	Jowai Distribution Division	Residential	37205	0	37205	0%	40.0578	0	40.0578	83%	38.44172	0	0	0	0	0%	15.74668	41%	3.307866	3.619269	109.41%	0.00%	
			Agricultura	970	0	970	3%	5.782	0	5.782	0	0	0%	49.5248	4.420349	0	4.420349	13%	14.2673	29%	4.002906	3.355778	83.83%	0.00%
11	Sub-total	Tura Distribution Circle	Residential	38276	0	38276	100%	48.2986	0.001	50.7952	100%	60.64377	3.840665	0	1.840665	0	1.840665	5%	15.74668	41%	3.677055	1.116501	30.36%	0.00%
			Agricultura	26287	421	26708	94%	44.25051	0.421	44.67151	0.045	0.045	0%	49.5248	35.2575	0	35.2575	100%	14.2673	29%	25.70055	28.1842	109.41%	22%
12	Sub-total	South Garo Hills Distribution Division	Residential	14439	1143	15582	96%	15.46129	1.144	16.60529	83%	22.8436	7.503186	0.647485	8.150671	76%	8.150671	76%	12.14943	53%	0.000476	0	0.00%	0.00%
			Agricultura	537	0	537	3%	1.6918	0	1.6918	0	0	0%	22.8436	0.000673	0	0.000673	0%	12.14943	53%	1.371341	0.852681	62.18%	0.00%
13	Sub-total	East Garo Hills Distribution Circle	Residential	15096	1143	16239	96%	18.91329	1.144	20.05729	100%	87.49565	10.04669	0.647485	10.69417	100%	10.69417	100%	12.14943	53%	0.057182	0	0.00%	0.00%
			Agricultura	59707	1587	61294	3%	0.017	0	0.017	0	0	0%	87.49565	7.8459	0.816838	38.66274	85%	12.14943	53%	6.851057	5.126943	74.83%	65%
14	Sub-total	West Garo Hills Distribution Circle	Residential	62442	1587	64029	100%	78.88847	1.587	80.47547	100%	87.49565	44.78101	0.816838	45.59785	100%	45.59785	100%	41.8978	48%	29.82215	26.79746	89.86%	53%
			Agricultura	470	7	477	98%	0.511	0.007	0.518	0.007	0.007	0%	87.49565	0.203864	0.002711	0.206575	60%	41.8978	48%	0.132987	0.163099	122.64%	0.00%
15	Sub-total	South-West Garo Hills Distribution Division	Residential	38440	768	39208	97%	41.2189	0.768	41.9869	84%	3.71584	0.04587	0	0.04587	0%	0.04587	0%	3.369229	91%	0.084782	0.086608	102.15%	0.00%
			Agricultura	1176	0	1176	3%	3.86506	0	3.86506	0	0	0%	3.71584	0.04587	0	0.04587	0%	3.369229	91%	0	0	0.00%	0.00%
16	Sub-total	DF_FEDCO	Residential	61907	11914	73821	97%	36.02133	4.03389	40.05522	80%	45.98634	26.87898	0.121335	27.00032	100%	27.00032	100%	18.98602	41%	17.43683	15.59415	89.43%	47%
			Agricultura	2399	0	2399	3%	7.187374	0	7.187374	0	0	0%	45.98634	66.86775	14.88468	81.75244	77%	18.98602	41%	0	0	0.00%	0.00%
17	Sub-total	DF_SAI	Residential	64489	11914	76403	100%	46.12578	4.03389	50.15967	100%	105.4966	90.6119	14.88468	105.4966	100%	105.4966	100%	0	0%	26.04231	21.46858	82.44%	18%
			Agricultura	26947	0	26947	97%	9.110367	0	9.110367	0	0	0%	105.4966	15.71343	0	15.71343	87%	0	0%	6.693009	6.703566	100.16%	0.00%
Sub-total	Sub-total	Sub-total	Residential	27817	0	27817	100%	11.47499	0	11.47499	100%	17.9734	17.9734	0	17.9734	100%	17.9734	100%	0	0%	6.693009	6.703566	100.16%	0%
			Agricultura	0	0	0	0%	0	0	0	0	0	0%	17.9734	0	0	0	0	0	0	0%	0	0	0.00%

Form-Input energy(Details of Input energy & Infrastructure)

A. Summary of energy input & Infrastructure

S.No	Parameters	Period From 1st Jan 24 To 31st March 24	Remarks (Source of data)
A.1	Input Energy purchased (MU)	2632.535	CGS+MePGCL+Others
A.2	Transmission loss (%)	4%	
A.3	Transmission loss (MU)	101.9079	
A.4	Energy sold outside the periphery(MU)	761.2039	
A.5	Open access sale (MU)	0	
A.6	EHT sale	0.00	
A.7	Net input energy (received at DISCOM periphery or at distribution point)-(MU)	1769.42	
A.8	Is 100% metering available at 66/33 kV (Select yes or no from list)	No	
A.9	Is 100% metering available at 11 kV (Select yes or no from list)	No	
A.10	% of metering available at DT	29%	
A.11	% of metering available at consumer end	97%	
A.12	No of feeders at 66kV voltage level	11	
A.13	No of feeders at 33kV voltage level	203	
A.14	No of feeders at 11kV voltage level	368	
A.15	No of LT feeders level	NA	
A.16	Line length (ckt. km) at 66kV voltage level	NA	
A.17	Line length (ckt. km) at 33kV voltage level	2797.4	
A.18	Line length (ckt. km) at 11kV voltage level	17697.98	
A.19	Line length (km) at LT level	29384.13	
A.20	Length of Aerial Bunched Cables	0	
A.21	Length of Underground Cables	1.86	
A.22	HT/LT ratio	0.697498	


Energy Manager
 MeECL, Meghalaya
 BEE Reg. No: EA-23306

S.No	Zone	Circle	Voltage Level (kVA)	Division (kVA)	Sub-Division (kVA)	Feeder ID	Feeder Name	Feeder Metering Status (Metered/unmetered/AMI/AMR)	Status of Meter (Functional/Non-functional)	Metering Date of last actual meter reading / communication	Feeder Type (Agri/Industrial/Mixed)	Status of Communication			Period from...to...			Remarks (Source of data)	
												% data received through automatic feeder AMI/AMR	Number of hours when meter was unable to communicate	Total Number of hours in the period	Meter S.No	CT/PT ratio	Import (MU)		Export (MU)
B.1	Eastern	Shillong	33kV	Shillong	Shillong					31.03.24	Mixed	0%				458.94		MTI Division	
B.2				132/33 KV Mawlai S/S						31.03.24	Mixed	0%							MTI Division
B.3						20 MVA X-mer-		Metered	Functional	31.03.24	Mixed	0%			MET00010				MTI Division
B.4										31.03.24	Mixed	0%			IEM10001714A				MTI Division
B.5						21 MVA X-mer-		Metered	Functional	31.03.24	Mixed	0%			MET00008				MTI Division
B.6										31.03.24	Mixed	0%			IEM10001687A				MTI Division
B.7						22 MVA X-mer-		Metered	Functional	31.03.24	Mixed	0%			MET00009				MTI Division
B.8										31.03.24	Mixed	0%			IEM10001686A				MTI Division
B.9					132/33 KV NEHU S/S					31.03.24	Mixed	0%							MTI Division
B.10							TRANSFORME	Metered	Functional	31.03.24	Mixed	0%			IEM1001656A				MTI Division
B.11							TRANSFORME	Metered	Functional	31.03.24	Mixed	0%			IEM10001651A				MTI Division
B.12					132/33 KV Mawphang S/S					31.03.24	Mixed	0%							MTI Division
B.13						132KV 20MVA X-		Metered	Functional	31.03.24	Mixed	0%			MET00014				MTI Division
B.14										31.03.24	Mixed	0%			IEM10001685A				MTI Division
B.15						132KV 20MVA X-		Metered	Functional	31.03.24	Mixed	0%			MET00019				MTI Division
B.16										31.03.24	Mixed	0%			IEM10001676A				MTI Division
B.17					132/33 KV Mawlyndee S/S					31.03.24	Mixed	0%							MTI Division
B.18							TRANSFORME	Metered	Functional	31.03.24	Mixed	0%			18135371				MTI Division
B.19							TRANSFORME	Metered	Functional	31.03.24	Mixed	0%			18135353				MTI Division
B.20										31.03.24	Mixed	0%							MTI Division
B.21					132/33 KV NEGRIMS S/S					31.03.24	Mixed	0%							MTI Division
B.22							TRANSFORME	Metered	Functional	31.03.24	Mixed	0%			MET00001				MTI Division
B.23							TRANSFORME	Metered	Functional	31.03.24	Mixed	0%			MET00002				MTI Division
B.24						132/11 KV IIM S/S				31.03.24	Mixed	0%							MTI Division
B.25						11 KV Incom		Metered	Functional	31.03.24	Mixed	0%			XE471653		21.66		MTI Division
B.26	Eastern	Khasi Hills	33KV	West Khasi Hilawryngkneng	Sonapani Small Hydro			Metered	Functional	31.03.24	Mixed	0%							MTI Division
B.27										31.03.24	Mixed	0%							MTI Division
B.28										31.03.24	Mixed	0%							MTI Division
B.29	Eastern	Khasi Hills	33KV	West Khasi Hilawryngkneng	33/11 KV LAD SMIT	LAD SMIT		Metered	Functional	31.03.24	Mixed	0%			XG414398		23.47		MTI Division
B.30										31.03.24	Mixed	0%							MTI Division
B.31										31.03.24	Mixed	0%							MTI Division
B.32										31.03.24	Mixed	0%			MET00013		9.63		MTI Division
B.33	Eastern	Khasi Hills	33KV	West Khasi Hilawryngkneng	33/11 KV LAD SMIT	33/11 KV TRANS		Metered	Functional	31.03.24	Mixed	0%							MTI Division
B.34										31.03.24	Mixed	0%							MTI Division
B.35	Eastern	Khasi Hills	33KV	West Khasi Hilawryngkneng	33/11 KV LAD SMIT	33/11 KV TRANS		Metered	Functional	31.03.24	Mixed	0%							MTI Division
B.36										31.03.24	Mixed	0%							MTI Division
B.37	Eastern	Khasi Hills	33KV	West Khasi Hilawryngkneng	33/11 KV LAD SMIT	33/11 KV TRANS		Metered	Functional	31.03.24	Mixed	0%							MTI Division
B.38										31.03.24	Mixed	0%							MTI Division
B.39	Eastern	Khasi Hills	33KV	West Khasi Hilawryngkneng	33/11 KV LAD SMIT	33/11 KV TRANS		Metered	Functional	31.03.24	Mixed	0%							MTI Division
B.40										31.03.24	Mixed	0%							MTI Division
B.41	Eastern	Khasi Hills	33KV	West Khasi Hilawryngkneng	33/11 KV LAD SMIT	33/11 KV TRANS		Metered	Functional	31.03.24	Mixed	0%							MTI Division
B.42										31.03.24	Mixed	0%							MTI Division
B.43										31.03.24	Mixed	0%							MTI Division
B.44	Eastern	Khasi Hills	33KV	West Khasi Hilawryngkneng	33/11 KV LAD SMIT	33/11 KV TRANS		Metered	Functional	31.03.24	Mixed	0%			MET00018		12.77		MTI Division
B.45										31.03.24	Mixed	0%							MTI Division
B.46	Eastern	Khasi Hills	33KV	West Khasi Hilawryngkneng	33/11 KV LAD SMIT	33/11 KV TRANS		Metered	Functional	31.03.24	Mixed	0%					15.24		MTI Division

Details of Input Energy Sources

Period From 1st April, 2023 - 31st March, 2024

A. Generation at Transmission Periphery (Details)

S.No.	Name of Generation Station	Generation Capacity (In MW)	Type of Station Generation (Based - Solid (Coal, Lignite)/Liquid/Gas/Renewable (biomass-bagasse)/Others)	Type of Contract (in years/months/days)	Type of Grid (Intra-state/Inter-state)	Point of Connection (POC) Loss MU	Voltage Level (At input)	Remarks (Source of data)
1	Umiam I	4X9	Hydro	PPA (25)	Intra-state		33	Management
2	Umiam II	2X10	Hydro	PPA (25)	Intra-state		33	Management
3	Umiam III	2X30	Hydro	PPA (25)	Intra-state		33	Management
4	Umiam IV	2X30	Hydro	PPA (25)	Intra-state		33	Management
5	MLHEP	3X42	Hydro	PPA (25)	Intra-state		33	Management
6	Umtru	4X2.8	Hydro	PPA (25)	Intra-state		33	Management
7	Sunapani	1X1.5	Hydro	PPA (25)	Intra-state		33	Management
8	New Umtru	2X20	Hydro	PPA	Intra-state		33	Management
9	Lakroh	1X1.5	Hydro	PPA	Intra-state		33	Management
10	Ganol	3X7.5	Hydro	PPA	Intra-state		33	Management
11	KOPILI	4X50	Hydro	PPA (5)	Inter-state		132	Management
12	KOPILI-Ext	1X25	Hydro	PPA (5)	Inter-state		132	Management
13	KHANDONG	2X25	Hydro	PPA (5)	Inter-state		132	Management
14	RANGANADI	3X135	Hydro	PPA (5)	Inter-state		132	Management
15	DOYANG	3X25	Hydro	PPA (5)	Inter-state		132	Management
16	AGBPP	6X33.5 +3X30	Gas-Steam	PPA (5)	Inter-state		132	Management
17	AGTTP	4X21+2X25.5	Gas	PPA (5)	Inter-state		132	Management
18	OTPC	2X363.3	Gas-Steam	PPA (25)	Inter-state		132	Management
19	Loktak	3X35	Hydro	PPA (15)	Inter-state		132	Management
20	AGTTP-CS	41	Gas-Steam	PPA	Inter-state		132	Management
21	Tipaimukh	1500	Hydro	PPA (5)	Inter-state		132	Management
22	BTPS	3X250	Coal	PPA (25)	Inter-state		132	Management
23	Loktak-DS	3X30	Hydro	PPA (5)	Inter-state		132	Management
24	Subansiri	8X250	Hydro	PPA (5)	Inter-state		132	Management
25	Pare	2X55	Hydro	PPA (5)	Inter-state		132	Management
26	Kameng	4X150	Hydro	PPA (5)	Inter-state		132	Management
27	Pallatana	2X 363.3	Hydro	PPA	Inter-state		132	Management
28	BGTTP	3X 250	Hydro	PPA	Inter-state		132	Management


 Energy Minister,
 MeECL, Meghalaya
 BEE Reg. No: EA-23306

(Details of Consumers)

Summary of Energy

Period From 1st January, 2024 - 31st March, 2024

S.No	Type of Consumers	Category of Consumers (EHT/HT/LT/Others)	Voltage Level (In Voltage)	No of Consumers	Total Consumption (In MU)	Remarks (Source of data)
1	Domestic	HT/LT	LT/11/33	548160	503.2476346	
2	Commercial	LT	LT	34049	87.32387641	
3	IP Sets					
4	Hor. & Nur. & Coffee/Tea & Rubber (Metered)					
5	Hor. & Nur. & Coffee/Tea & Rubber (Flat)					
6	Heating and Motive Power					
7	Water Supply	LT	LT	468	7.772157803	
8	Public Lighting	LT	LT	71	1.27233204	
9	HT Water Supply	HT	11 or 33	81	38.97714237	
10	HT Industrial	HT	11 or 33	208	537.7085661	
11	Industrial (Small)	LT	LT	640	4.89257937	
12	Industrial (Medium)					
13	HT Commercial	HT	11 or 33	225	34.36540461	
14	Applicable to Government Hospitals & Hospitals					
15	Lift Irrigation Schemes/Lift Irrigation Societies					
16	HT Res. Apartments Applicable to all areas					
17	Mixed Load	HT/LT	LT, 11 or 33	2243	14.26540443	
18	Government offices and department	HT/LT	LT, 11 or 33	208	80.4122358	
19	Crematorium	LT	LT	1	0.186472	
20	Agriculture	LT	LT	22	0.10100824	
21	EV	LT	LT	2	0.001527	
22	Distribution Franchisee-1_FEDCO	HT/LT	LT, 11 or 33	76403	105.496582	
23	Distribution Franchisee-2_SAI	HT/LT	LT, 11 or 33	27817	17.973402	
			Total	690598	1434.00	