COCHIN SPECIAL ECONOMIC ZONE AUTHORITY (CSEZA)

Kakkanad, Cochin-682 037

Report On

Annual Energy Audit

(2022-23)

KERALA STATE PRODUCTIVITY COUNCIL

Productivity House, H.M.T. Road,
Post Box No. 8, Kalamassery - 683104
Phone: 0484-2555526, 2555367, 2532107
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Acknowledgement

Kerala State Productivity Council (KSPC) places on records its deep gratitude to the management of Cochin Special Economic Zone Authority (CSEZA), Kakkanad entrusting the work of Annual Energy Audit for FY 2022-2023 as per BEE regulations.

We would also like to thank the following officials of CSEZA, Kakkanad for their proactive support and courtesy extended to the KSPC team during the study and all other staffs for their cooperation and support given during data collection.

Officials from CSEZA:

Ms. Hemalatha P IAS, Development Commissioner & Chairman
Mr. Boni Prasada Rao, Deputy Development Commissioner
Mr. Pamodu S., Secretary-in-Charge (Nodal Officer)
Mr. Krishna Varma K., Power Consultant
Mr. Ratheesh Kumar A., Top Level Expert (Energy Manager)
Mr. Harish B. H., Top Level Expert

Consultants (KSPC):

Mr. Richu Zachariah, Assistant Director, KSPC (BEE Certified Energy Auditor)
Mr. Vishnu T.R, Assistant Director, KSPC
Mr. Abhijith Narayanan, Consultant Engineer, KSPC
Mr. Jithin K Thomas, Consultant Engineer, KSPC

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STUDY TEAM

Table 1: Study Composition Team

Sl. No.	Name	Qualification	EM/EA/AEA/EmAEA Registration No	Experience (In Years)
Team Leader				
1	Shanavaz K M	• Post-Graduation in Energy Engineering • B.Tech (Electrical & Electronics Engineering)	Accredited Energy Auditor (AEA-099)	20
Team Members				
2	Richu Zachariah	• Post-Graduation in Energy Engineering	Certified Energy Auditor (EA-27720)	5
3	Vishnu T R	• B.Tech (Mechanical Engineering)	-	6
4	Abhijith Narayanan	• M.Tech in Power Electronics • B.Tech (Electrical & Electronics Engineering)	-	4
5	Jithin K Thomas	• M.Tech in Energy Management • B.Tech (Electrical & Electronics Engineering)	-	2
Energy Audit Cell of DISCOM				
6	Boni Prasada Rao	• Post-Graduation in Mechanical Engineering	-	15
7	Pramodu S	• Graduation in Science	-	10
8	Ratheesh Kumar A	• Post-Graduation in Power System Engineering	Certified Energy Manager (EM-5037)	14

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List of Abbreviations

A	Ampere
BEP	Best Efficiency Point
CD	Contract Demand
ECBC	Energy Conservation Building Code
EPI	Energy Performance Index
Hz	Hertz
HT	High Tension
IEEE	Institute of Electrical & Electronics Engineers
kVA/ VA	Kilo Volt Ampere/ Volt Ampere
kVAR/ VAR	Kilo Volt Ampere Reactive/Volt Ampere Reactive
kW/ W	Kilo Watt/ Watt
PF	Power Factor
RMD	Recorded Maximum Demand
SEC	Specific Energy Consumption
THD	Total Harmonic Distortion
ARR	Aggregate Revenue Requirement
V	Volt
VFD	Variable Frequency Drive
ABR	Average Billing Rate

EXECUTIVE SUMMARY

Cochin Special Economic Zone Authority (CSEZA), Kakkanad, Kochi-37, under the Ministry of Commerce & Industry, Government of India, is the licensee for power distribution in the Zone area situated at Kakkanad. CSEZA has been constituted under Section 31(5)(3)(1) of the Special Economic Zone Act, 2005, which shall function as developer of the zone. As of Financial year 2022-23, CSEZA has a total number of 163 consumers in four consumer categories, which is 1 no. of Agricultural consumers, 113 no. of Commercial/Industrial-LT consumers, 25 no. of Commercial/Industrial-HT consumers and 24 no. of Others- LT.

The key energy parameters for the FY 2022-23 has shown below:

Table 2: Key Energy Parameters for the FY 2022-23

Particular	Unit	FY 2022-23
Power purchase from KSEBL	Million KWh	56.00
Power generated from CSEZA's solar plants	Million KWh	1.32
Total Input Energy	Million KWh	57.32
Net Input Energy (at DISCOM Periphery after adjusting the transmission losses and energy traded)	Million KWh	57.32
Total Energy Billed (is the Net energy billed, adjusted For energy traded)	Million KWh	56.41
Transmission and Distribution (T&D) Loss	Million KWh	0.91
	%	1.587
% of Metering available at DT	%	6.66
% of Metering available at consumer end	%	100
No. of feeders at 66 kV voltage level	No.	0.00
No. of feeders at 33 kV voltage level	No.	0.00
No. of feeders at 11 kV voltage level	No.	12.00
No. of LT feeders' level	No.	0.00
Line length (ckt.km) at 66 kV voltage level	ckt.km	0.00
Line length(ckt.km) at 33 kV voltage level	ckt.km	0.00
Line length(ckt.km) at 11 kV voltage level	ckt.km	12.88
Line length(ckt.km) at LT level	ckt.km	10.71
Length of Underground Cables	ckt.km	23.59
HT/LT Ratio	HT:LT	1.20

The data from DC has collected for the financial year 2022-23 for the data generation. The key performance findings are:

- The Input Energy Purchased for the FY 2022-23 is 57.32 Million KWh.
- The Total Energy Billed (is the Net energy billed, adjusted for energy traded) for the FY 2022-23 is 56.41 Million KWh.
- The Transmission and Distribution (T&D) Losses is 0.91 Million KWh for FY 2022-23 and accounts to 1.587%.

The Annual Audit is completed as per PAT Rules and guidelines issued by BEE using the latest DISCOM specific pro-forma filled by DC and KSPC team and sent to SDA/BEE for further review and acceptance.

1. INTRODUCTION OF ACCREDITED ENERGY AUDITING FIRM [EMAEA]

1.1 The Kerala State Productivity Council was established in 1959 as a tripartite organization with representation from State Government, Industrial Management and Employee unions. The Council is recognized by National Productivity Council, New Delhi and Asian Productivity Organization, Tokyo.

1.2 The basic mission of the council is to enhance Productivity in all walks of human endeavor. We consider Productivity as a powerful grass-root movement essential to nation building. During the past five decades of its existence, the Council has emerged out as one of the leading Productivity Councils in the country.

1.3 KSPC is spearheading the Productivity movement in Kerala State by imparting training and consultancy services in productivity techniques. The council has been successful in helping industries make distinctive and lasting improvements in performance to become more competitive with excellent techniques, systems and education.

1.4 Consultancy services of KSPC on industrial engineering, organizational structuring, Energy, Safety Health & Environment management and Quality system procedures focus on making industries more successful by providing practical solutions as cost effectively as we can. Most of the industries in the State of Kerala in both public and private sector could make use of these services in the past fifty-five years.

1.5 KSPC is empaneled energy audit firm with

- Bureau of Energy Efficiency (BEE), Ministry of Power, Govt. of India,
- Energy Management Centre (EMC) – Kerala, SDA BEE, Ministry of Power, Govt. of Kerala.

1.6 Registration No.

- EmAEA Name: Shanavaz K M
- Registration Number: AEA - 099

2. INTRODUCTION ABOUT DISCOM SECTOR

2.1 A healthy distribution sector is considered as the key to financially viable power sector. One of the major challenges affecting the health of Indian distribution sector is the high Aggregate Technical and Commercial (AT&C) losses.

2.2 AT&C loss is the sum of technical loss and commercial loss. The technical loss occurs due to flow of energy into transmission and distribution network. Technological advancements could help in reduction of technical loss to an optimum level.

2.3 On the other hand, the commercial loss is mostly man-made and occurs due to inefficient billing and collection of the energy supplied, illegal connections, theft, meter tampering, and pilferage, etc. The commercial loss is occurring mostly due to managerial issues and could be brought down to zero with efficient administrative practices.

2.4 In order to improve the energy efficiencies in the power system, State electricity Distribution Companies are included in PAT cycle II.

2.5 DISCOMs having AT&C losses of 1000 Million Unit (MU) (Equivalentto86000MTOE) and above are notified as Designated Consumers and targets were assigned to 44 DISCOMs for reducing the T&D losses under PAT Cycle-II. T&D losses are considered as performance matrix of electricity distribution companies under PAT.

2.6 Under the notification S.O.3445 (E) dated 28Sept2020, all entities having distribution license are notified as Designated Consumers. That is as per the notification, which was formulated in consultation with Bureau of Energy Efficiency (BEE). All entities having issued distribution license by State/Joint Electricity Regulatory Commission under the Electricity Act, 2003 (36of2003)"are notified as Designated Consumers (DCs).

2.7 After this notification, all the DISCOMs will be governed under the various provisions of EC Act, such as Appointment of Energy Manager, Energy Accounting & Auditing, and identification of Energy Losses Category wise, Implementation of energy conservation & efficiency measures etc. for each DISCOMs.

2.8 Earlier, the DISCOMs whose annual energy losses were equal to or above 1000 MU were only covered as DCs. Now with this notification, the number of DISCOMs covered under the EC Act will increase from 44 to103.

2.9 This decision will facilitate Energy Accounting & Auditing as mandatory activity for all the

DISCOMs, leading to the actions towards reducing losses and increase profitability of DISCOMs.

2.10 The amendment is expected to help DISCOMs to monitor their performance parameters and bring in transparency in the Distribution sector through professional inputs.

2.11 It will also assist in developing projects for reducing the electricity losses by DISCOMs and implementing effective solutions. The amendment is expected to improve the financial state of the DISCOMs.

2.12 The quarterly data of these DISCOMs will be collected and monitored by the government to suggest measures for increasing the efficiency and reduce the energy loss. This move is expected to gradually become more effective if extended up to the level of end consumers.

2.13 Name and details of Energy Manager

CSEZA, Kakkanad has designated Mr. Ratheesh Kumar A, Certified Energy Manager, BEE as Energy Manager for taking up various activities coming under PAT scheme with BEE.

2.14 Introduction of Designated Consumer

Sector, Name & Address of DC

DISCOM
Cochin Special Economic Zone Authority (CSEZA)
CSEZ Administrative Building Kakkanad, Ernakulam,
Kerala- 682037, India

2.15 Name and details of Authorized signatory and Energy Manager of DC

Table 3: Name & Details of Energy Manager & Authorized Signatory of DC

General Details	Description
Registered Office address with telephone, Fax nos. & e-mail	Mr. Pramodu S Secretary Cochin Special Economic Zone Authority (CSEZA) Ministry of Commerce & Industry, GoI, Kakkanad, Cochin Telephone: 91 484 2413222

General Details	Description
Energy Manager's Name, designation, Registration No., Address, Mobile, Telephone, Fax nos. & e-mail	Mr. Ratheesh Kumar A Certified Energy Manager Registration Number –EM- 5037 Mob. No.: +91 9744962260 ratheeshkumar.a@gmail.com

2.16 About Designated Consumer (DC):Cochin Special Economic Zone Authority (CSEZA)

- The Cochin Special Economic Zone (CSEZ) is a multi-product special economic zone located at Kochi, Kerala. CSEZA was constituted in accordance with the provisions of section 31 of the Special Economic Zones Act, 2005, by notification dated 27th February 2009, in the State of Kerala set up for export- oriented ventures. The Special Economic Zone is a foreign territory within India with special rules for facilitating foreign direct investment. It is established in an area of 41.7 hectares (103.0 acres) in Kakkanad.
- It is a multi-product zone, with industrial units operating in Electronics Hardware, Engineering, Gem & Jewellery, IT & ITES, Agro & Food Processing, Textile & garments, Plastic & Rubber etc. Currently it has around 160 units operating employing more than 15,000 people.
- CSEZ was originally started as one of the first Export Process in Zone in India, and was later converted into a Special Economic Zone in 2003, when that system was introduced. It is operated by the Government of India, Ministry of Commerce, under the CSEZ Authority, and headed by a Development Commissioner. It is the first integrated industrial park in Kerala.
- The Cochin Special Economic Zone Authority (CSEZA) was constituted in accordance with the provisions of section 31 of the Special Economic Zones Act, 2005, by notification dated 27th February 2009. The Authority became operational on 1st April, 2009. The corporate office of the Authority is at CSEZ, Kakkanad.
- The CSEZ Authority consists of Chairman and five members. Three of them hold office ex-officio with two representing the Central Government and having experience in matters relating to SEZs and one representing the Department of Commerce.

Development Commissioner, Cochin Special Economic Zone is the ex-officio chairman of the authority with the Deputy Development Commissioner, CSEZ, Jt. Director General of Foreign Trade, Cochin and Joint Secretary, Department of Commerce being the other ex-officio members. In addition, two members of the authority are nominated by the Central Government from among entrepreneurs as defined in the SEZ Act.

- Cochin Special Economic Zone, Kakkanad, Kochi-37, under the Ministry of Commerce& Industry, Government of India, is the licensee for power distribution in the Zone area situated at Kakkanad.

3. BACKGROUND

3.1 About BEE

The Government of India has set up Bureau of Energy Efficiency (BEE) on 1st March 2002 under the provision of the Energy Conservation Act, 2001. The mission of Bureau of Energy Efficiency is to assist in developing policies and strategies with a thrust on self-regulation and market principles with the primary objective of reducing energy intensity of the Indian economy within the overall framework of the Energy Conservation Act, 2001. This will be achieved with active participation of all stakeholders, resulting into accelerated and sustained adoption of energy efficiency in all sectors.

Brief about PAT under NMEEE

3.2 In 2008, Government of India announced 'National Action Plan on Climate Change (NAPCC), identifying eight missions to promote inclusive growth in the country. The National Mission for Enhanced Energy Efficiency (NMEEE) is one of the eight identified missions under NAPCC and One of the initiatives under NMEEE is Perform Achieve and Trade (PAT) scheme; which is a market-based mechanism having the objective to enhance energy efficiency (target based) in the country with an option to trade the additional energy savings, in the form of energy saving certificates. Bureau of Energy Efficiency (BEE) under Ministry of Power (MoP) is implementing this scheme in 13 energy intensive sectors namely- Thermal Power Plant, Aluminum, Pulp &Paper, Chlor- Alkali, Cement, Iron & Steel, Textile, Fertilizer, Refinery, Railways, DISCOM, Petro-chemical & Buildings.

3.3 Role of BEE

- Direct mandatory display of label on notified equipment and appliances.
- Specifyenergyconsumptionstandardsfornotifiedequipmentandappliance.
- Prohibit manufacture, sale, purchase and import of notified equipment and appliances not conforming to standards.
- Energy Management Centre, Kerala is the State Designated Agency for the State of Kerala.

4. APPROACH, SCOPE, METHODOLOGY AND TEAM ASSIGNMENT

4.1 Period of verification

The kick-off meeting was held on June 27th, 2023 and the onsite verification process for CSEZA was carried out during July 2023.

4.2 Purpose, Scope and Objective of the project

- The baseline report contains in detail the Energy performance as units purchased and revenue realized with the detailed Transmission and Distribution losses of the Designated Consumer during the year 2022-23. It contains the summary of the verification process and with supporting documents.
- The report includes the evaluation of energy performance of Designated Consumer during Year 2022-23 taking relevant factors into consideration as defined by the PAT rules. The report also highlights all the energy saving options implemented by the company to achieve its own energy saving target internally if any. The reduction in specific energy consumption or savings from energy conservation measure has been verified and documental proof of the same has been provided in the report.
- The verification report contains the details of verification activities carried out in order to arrive at the conclusion and opinion, including the details captured during the verification process and conclusion relating to compliance with energy consumption norms and standards, increase or decrease in T&D Losses with reference to the baseline year.

Minutes of Meeting with the DISCOM and Verification Team

The Annual Energy Audit at Cochin Special Economic Zone Authority (CSEZA) commenced on 10th July, 2023 with the following members of Kerala State Productivity Council (KSPC), Kalamassery, Kochi.

1. Mr. Shanavaz K.M, Joint Director, KSPC (Accredited Energy Auditor)
2. Mr. Richu Zachariah, Assistant Director, KSPC (Certified Energy Auditor)
3. Mr. Vishnu T.R, Assistant Director, KSPC
4. Mr. Abhijith Narayanan, Consultant Engineer, KSPC
5. Mr. Jithin K Thomas, Consultant Engineer, KSPC

The following personnel from CSEZA were involved in the successful completion of the annual energy audit.

6. Mr. Boni Prasada Rao, Deputy Development Commissioner
7. Mr. Pamodu S., Secretary-in-Charge (Nodal Officer)
8. Mr. Krishna Varma K., Power Consultant
9. Mr. Ratheesh Kumar A., Top Level Expert (Energy Manager)
10. Mr. Harish B. H., Top Level Expert

Mr. Shanavaz K.M, Accredited Energy Auditor gave a brief introduction on various aspects of PAT scheme on the first day of the audit. The audit team conducted a walkthrough survey throughout the entire facility to understand the complexity of the distribution system inside the licensee area.

The filling of energy accounting format was completed by the audit team lead by the Accredited energy auditor with the support of Energy Manager appointed by the Licensee. The report of the annual energy audit was completed at later stage and the same handed over to the Licensee.

The original duly filled accounting format signed by unit head/CEO of the licensee along with the report and other supporting documents were packed & sealed to submit to BEE. A copy of the above report has been handed over to the authorized representative of the CSEZA and one copy is maintained by the auditing agency.

Boni Prasad Rao	**Pramodu S**	**Krishna Varma K**	**Ratheesh Kumar A**
Harish B.H	**Shanavaz K M**	**Richu Zachariah**	**Vishnu T. R.**
Abhijith Narayanan	**Jithin K Thomas**		

5. ENERGY SCENARIO FOR THE FINANCIAL YEAR 2022-23

5.1 The Consumer Category wise billed energy consumption shares in the FY 2022-23 of DISCOM is shown in below table:

Table 4: Details of FY 2022-23 Energy Consumption Scenario Circle Wise

Sl. No.	Name of Circle	Consumer Category	Energy Parameters for 2022-23		
			Billed Energy(MU)		% of Energy Consumption
			Input Energy (MU)	Total Energy (MU)	
1	CSEZA, Kakkanad	Residential	57.32	0.00	00.00%
		Agricultural		1.3855	2.00%
		Commercial/ Industrial-LT		9.5371	17.00%
		Commercial/ Industrial-HT		44.9473	80.00%
		Others		0.5449	1.00%

5.2 Infrastructure Details

The Network system as on the FY 2022-23 consists of Length of 11 KV Line (12.88 ckt.km.), Length of LT Line (10.71 ckt.km.), Length of Underground Cable Lines including HT and LT (23.59 ckt.km.), No. of 11 KV Group & Feeder Breakers and 33kV, 11kV & DTR metering, Transformer capacity are also given in details, it is mentioned in the table below:

Table 5: Summary of Energy Input and Infrastructure

B.Summary of Energy Input & Infrastructure		
Sl. No	Parameters	FY 2022 - 2023
A.1	Power purchase from KSEBL (MU)	56.00
A.2	Power generated from CSEZA's solar plants (MU)	1.32
A.3	Total Input Energy (MU)	57.32
A.4	Transmission loss (%)	1.587
A.5	Transmission loss (MU)	0.91
A.6	Energy sold outside the periphery (MU)	0.00
A.7	Open access sale (MU)	0.00
A.8	EHT sale	0.00
A.9	Net Input Energy (received at DISCOM periphery or at distribution point, after adjustment)-(MU)	57.32
A.10	Is 100% metering available at 66/33 KV (Select yes or no from list)	No

B.Summary of Energy Input & Infrastructure		
Sl. No	**Parameters**	**FY 2022 - 2023**
A.11	Is 100% metering available at 11 KV (Select yes or no from list)	Yes
A.12	% of metering available at DT	6.66%
A.13	% of metering available at consumer end	100%
A.14	No of feeders at 66 KV voltage level	0.00
A.15	No of feeders at 33 KV voltage level	0.00
A.16	No of feeders at 11KV voltage level	12.00
A.17	No of LT feeders level	0.00
A.18	Line length (ckt.km) at 66 KV voltage level	0.00
A.19	Line length (ckt.km) at 33 KV voltage level	0.00
A.20	Line length (ckt.km) at 11 KV voltage level	12.88
A.21	Line length (km) at LT level	10.71
A.22	Length of Underground Cables	23.59
A.23	HT/LT ratio	1.20

Table 6: Operational Transformer Inventory Details as of 2022-23

Sl. No.	Transformer Description	Qty.	Location	
1	Power Transformer, 10/12.5 MVA, 110/11 kV	2	AIS Yard	
2	Distribution Transformer, 400 KVA, 11/433 kV , 50 Hz	1	Substation- (Auxiliary)	
3	Distribution Transformer, 500 KVA, 11/433 kV , 50 Hz	1	Near RMU 1B1	Ring- 1
4	Distribution Transformer, 800 KVA, 11/433 kV , 50 Hz	1	Near RMU 1B1	
5	Distribution Transformer, 1250 KVA, 11/433 kV , 50 Hz	2	SDF-17	Ring- 2
6	Distribution Transformer, 500 KVA, 11/433 kV , 50 Hz	1	Near RMU 2C1	
7	Distribution Transformer, 500 KVA, 11/433 kV , 50 Hz	1	Warehouse TFR	
8	Distribution Transformer, 400 KVA, 11/433 kV , 50 Hz	2	SDF-16	
9	Distribution Transformer, 630 KVA, 11/433 kV , 50 Hz	1	Near RMU 3B3	Ring- 3
10	Distribution Transformer, 500 KVA, 11/433 kV , 50 Hz	1	Nera RMU 3D1	
11	Distribution Transformer, 500 KVA, 11/433 kV , 50 Hz	1	WTP TFR	
12	Distribution Transformer, 1250 KVA, 11/433 kV , 50 Hz	1	SDF-43	
Total Transformers		**15**		

5.3 The details of the electrical power distribution system of the CSEZA is given below:

Table 7: Existing Power Distribution Details of CSEZA

Facility	Cochin Special Economic Zone Authority (CSEZA)
Tariff	EHT-Licensee
Supply voltage	110 kV
Contract Demand	13000 kVA
Number of Transformers	15 Nos. (including 2 Power Transformers)

The CSEZA purchases power for the licensee area from KSEB Ltd. under BULK Supply Tariff applicable to Small Licensees category. The contract demand of the EHT connection is 13000 kVA.

5.4 **Energy Conservation (Past & Future):**

- Solar Power Plant of Capacity 1290 kWp:

  The establishment of the 1290 kWp solar power plant by the CSEZA signifies a significant milestone in their pursuit of sustainability and energy independence. This clean and renewable energy generation will contribute to a greener future, reducing carbon emissions and inspiring the community to embrace renewable energy practices. CSEZA remains committed to exploring further opportunities in renewable energy, expanding its impact on the path towards a sustainable and resilient future. By diversifying their energy mix and investing in renewable energy, CSEZA not only strengthens their own energy security but also promotes economic growth, job creation, and attracts sustainable industries to the region.

- Upgrading Energy Meters to Class 0.2s and 0.5s:

  As part of its continuous efforts towards energy efficiency and accurate monitoring, the CSEZA has undertaken a significant initiative to upgrade energy meters across its facilities. This upgrade involves the installation of Class 0.2s meters for High Tension (HT) connections and Class 0.5s meters for Low Tension (LT) connections. By implementing these advanced meters, CSEZA aims to enhance the precision of energy measurement, ensuring more accurate billing and promoting transparency in energy consumption. The upgraded meters will provide highly reliable data, enabling CSEZA to monitor and analyze energy usage patterns more effectively. This initiative reflects CSEZA's commitment to

optimizing energy management and aligning with industry best practices, ultimately contributing to a more sustainable and efficient energy infrastructure within the zone.

- Consumer Awareness Programs:

  CSEZA recognizes the vital role consumers play in energy conservation efforts. These programs will cover various topics such as energy-saving tips, efficient appliance usage, and the numerous benefits of conservation. By empowering consumers with knowledge, CSEZA aims to foster a culture of energy consciousness and active participation in energy-saving initiatives.

5.5 Energy Scenario & Energy Performance Index:

The energy scenario and performance indices for the financial year 2022-23 is mentioned in this section under Table-5.

6. ELECTRICAL DISTRIBUTION SYSTEM

6.1 CSEZA has consumer's category in majorly 4 types of Consumer Categories out of the 5 as specified in Sector Specific Pro-format of Form-1. The categorization as per BEE are:

1. Residential
2. Agricultural
3. Commercial/Industrial LT
4. Commercial/Industrial HT
5. Others

The type of consumer observed in CSEZA is as tabulated in the table below:

Table 8: Consumer Category for Year 2022-23

Details of Consumer Category for FY 2022-23		
Type of Consumer Category	**No. of Consumer**	**%**
Residential	0	0%
Agricultural	1	1%
Commercial/Industrial-LT	113	69%
Commercial/Industrial-HT	25	15%
Others	24	15%
Total	163	100%

Figure 1: Percentage wise consumer category for the year 2022-23

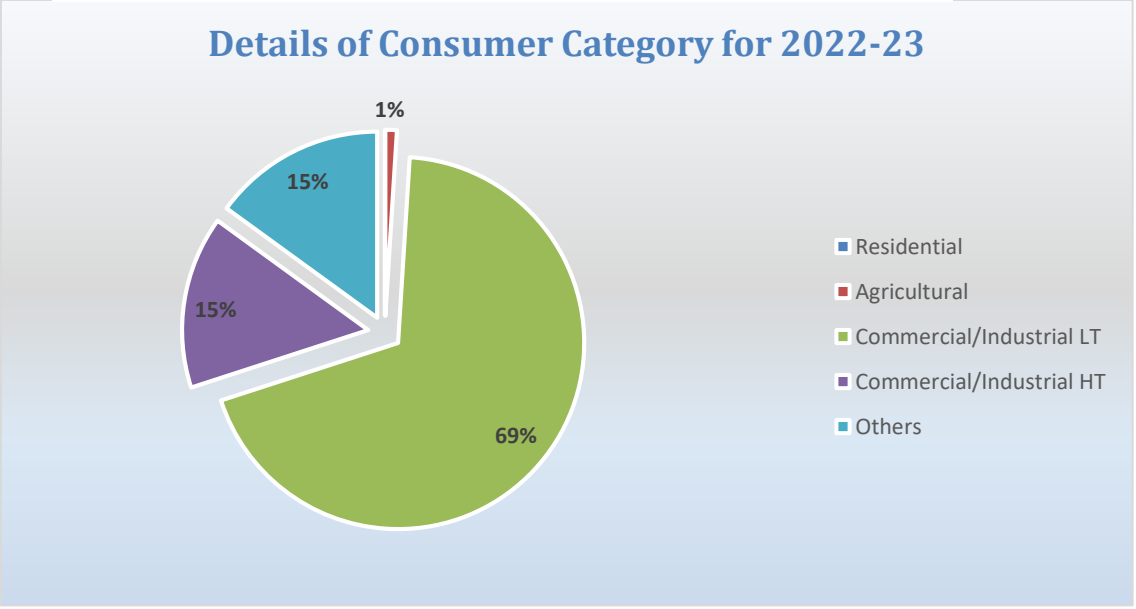
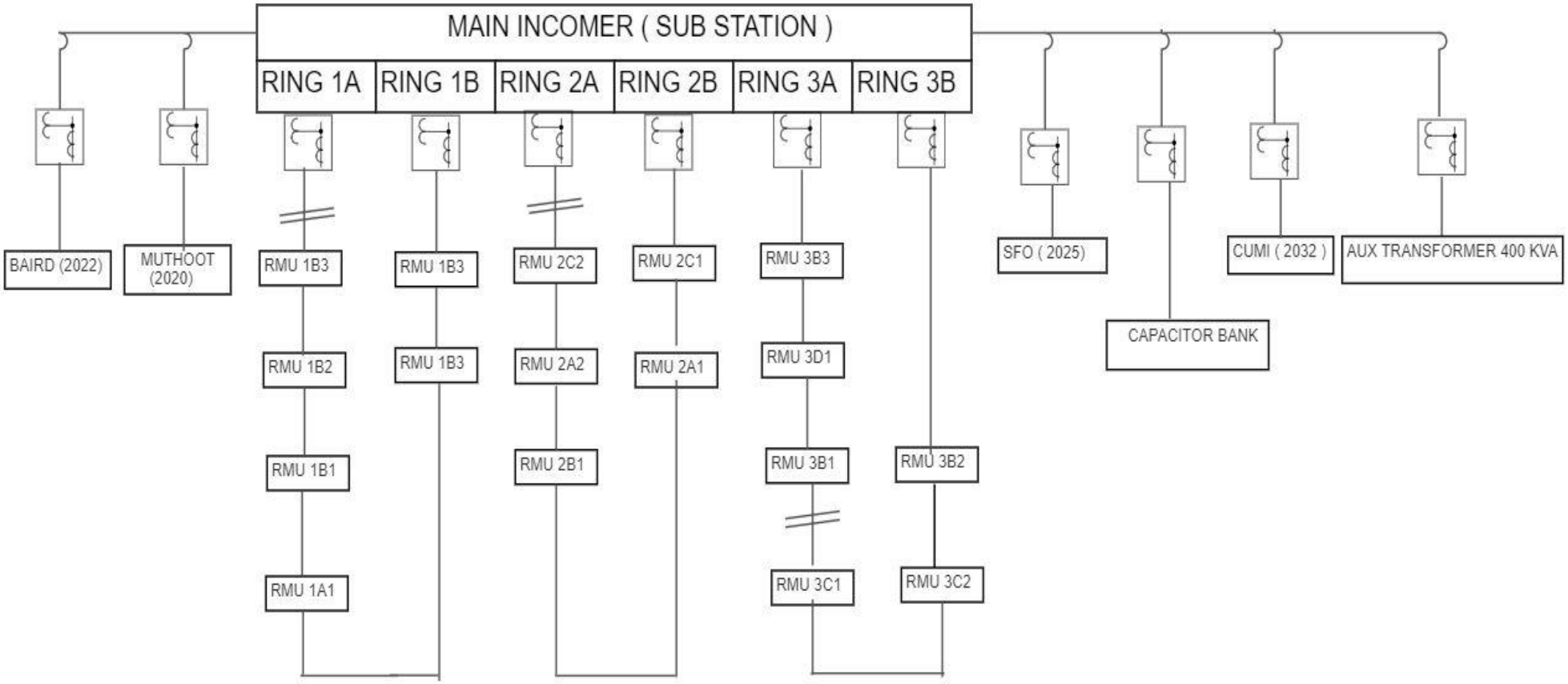
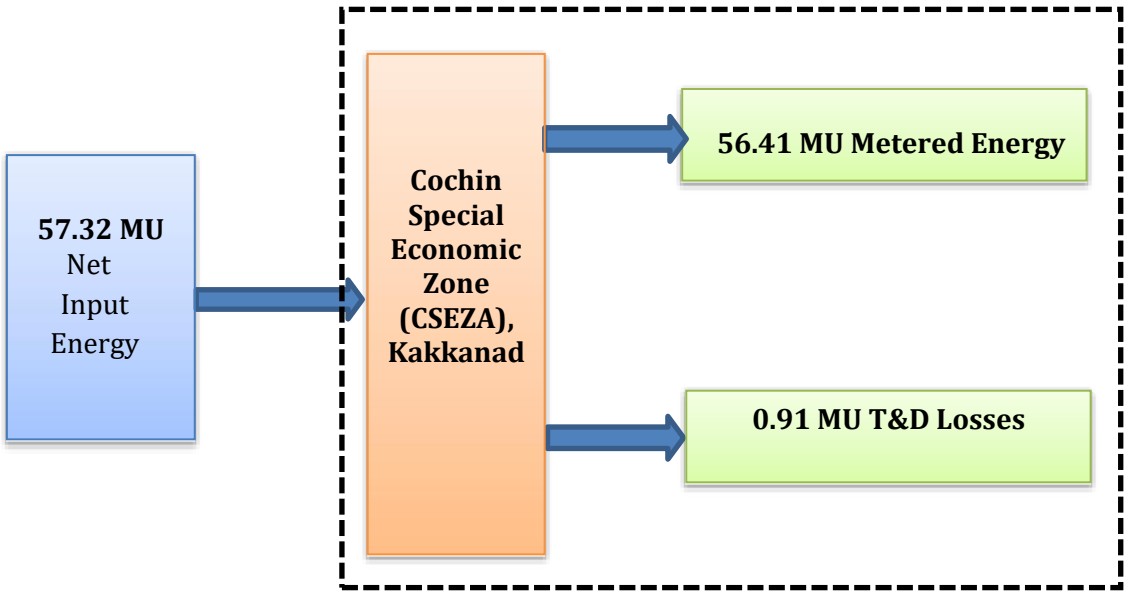


Figure 2: RMU Distribution at CSEZA



6.2 Gate to Gate Boundary Energy Diagram

CSEZA receives power supply from KSEBL (Kerala State Electricity Board Limited). The bulk supply tariff of CSEZA for the FY 2022-23 is Rs.6.15/unit for energy charges and Rs.380/kVA for demand charges. CSEZA campus is having an agreement with KSEBL for a contract demand of 13000 KVA. The Gate-to-Gate Boundary Diagram for FY 2022-23 is as shown in figure below.



6.3 Grid Strengthening Measures and Modern Technologies

- CSEZA proposes the implementation of advanced energy management systems. These systems will enable real-time monitoring and optimization of energy consumption across various sectors. Through intelligent control and automation, the potential for energy savings is significant. By adopting energy management systems, CSEZA aims to maximize energy efficiency and minimize waste.

6.4 Power Purchase Details

The CSEZA purchases power for the licensee area from KSEB Ltd. under BULK Supply Tariff Applicable to Small Licensees category. The contract demand of the EHT connection is 13000 kVA for CSEZA.

Table 9: Details of power sales and purchase for CSEZA in FY 2022-23

Sales of Power for Financial Year 2022-23 (As of 31st March,2023)					
Sl. No.	Particulars	Number of Consumers	Connected Load	Units Sold (Lakh Units)	Units Total (MU)
1	LT-IV(A)	59	3420.7	6126475	
2	LT-IV(B)	33	2248.3	3187912	
3	LT-VI(A)	1	3	3653	
4	LT-VI(B)	2	9	34620	
5	LT-VI(C)	5	25	16021	
6	LT-VI(F)	21	300.3	414833	
7	LT-VII(A)	15	297.1	30707	
8	LT-VII(C)	1	12	168842	
9	LT-VIII(B)	1	17	23180	
Agricultural, LT- Industrial/ Commercial and Others		138	6332.4	10081992	10.08
1	HT-I(A)	23	11214.9	42856316	
2	HT-I(B)	1	675	2090965	
3	HT-III(B)	1	297	1385495	
HT Industrial and Commercial		25	12186.9	46332776	46.33
Grand Total Sales		163	19431	56414768	56.41
Power Purchase					56.00
Solar					1.32
Total Input Energy					57.32

6.5 Circle wise losses details with Consumer details

- As of the financial year 2022-23 data, CSEZA Kakkanad has 163 number of consumers with a cumulative connected load of 19.43 MW and 56.41 MU Billed energy, which is also, 100% metered from consumer end. The Agricultural category accounts for 1 number of consumers with a connected load of 0.33 MW and billed energy of 1.38 MU. The commercial LT category accounts for 113 number of consumers with a connected load of 6.02 MW and billed energy of 9.53 MU. The commercial HT category accounts for 25 number of consumers with accumulative connected load of 12.76 MW and billed energy of 44.94 MU. The Other category accounts for 24 number of consumers with a connected load of 0.31 MW and billed energy of 0.54 MU.

- The overall T&D Loss of CSEZA is 0.91 MU, 1.59% in 2022-23 financial year. The data for the same is shown in the table below:

Table 10: Details of Circle wise losses with Consumer category for 2022-23

Sl. No.	Name of Circle	Consumer Profile			Losses	
		Consumer Category	No. of Metered Connections	% of Total Number of Connections	T&D Loss (MU)	T&D Loss (%)
1	CSEZA, Kakkanad	Residential	0	0%	0.91	1.587%
		Agricultural	1	0.61%		
		Commercial/ Industrial-LT	113	69.33%		
		Commercial/ Industrial-HT	25	15.34%		
		Others	24	14.72%		
Total			163	100%	0.91	1.587%

- **<u>Methodology for T&D loss computation:</u>**

  - $T\&D\ Losses\ (MU)\ of\ acircle = Sum\ of\ Input\ Energy\ of\ the\ circle\ (MU) - Sum\ of\ Metered\ energy\ of\ all\ categories\ within\ the\ circle\ (MU)$
  - T&D Losses in % = $\frac{T\&D\ Losses\ (MU)}{Input\ Energy\ to\ the\ Circle\ (MU)} * 100$

6.6 Category of service details (with Consumer and Voltage-wise)

It can be observed that the maximum numbers of consumers are from the LT Industrial IT/ITES category, these consumers along with the IT/ ITES consumers under the HT category are the mainstay of the licensee. As of Financial year 2022-23, CSEZA has a total number of 163 consumers in four number of consumer category, which is 1 number of Agricultural consumer category, 113 number of Commercial/Industrial- LT consumer category, 25 number of Commercial/Industrial-HT consumer category and 24 number of Others consumer category. The details for the consumer service for FY 2022-23 is as per the table below:

Table 11: Details of Consumer Service for FY 2022-23

Sl. No	Name of Circle	Consumer Profile								
		Consumer Category	No of Connection Metered	No of connection Un-metered	Total Number of Connections	% of Number of Connections	Connected Load Metered(MW)	Connected Load Un-metered (MW)	Total Connected Load (MW)	% of Connected Load
1	CSEZA, Kakkanad	Residential	0	0	0	0%	0.00	0.00	0.00	0%
		Agricultural	1	0	1	0.61%	0.33	0.00	0.33	2%
		Commercial/ Industrial-LT	113	0	113	69.33%	6.02	0.00	6.02	31%
		Commercial/ Industrial-HT	25	0	25	15.34%	12.76	0.00	12.76	66%
		Others	24	0	24	14.72%	0.31	0.00	0.31	2%
Total			163	0	163	100%	19.43	0.00	19.43	100%

6.7 Various losses in last three years

- AT&C Losses at CSEZA

The aggregate losses of the system are subdivided into technical and commercial losses. The technical losses consist of the losses in the transmission and distribution network, losses in transformer and other electrical equipment whereas commercial losses include losses due to incorrect metering, billing errors, tampering of meters, sluggish meters etc. All the electromagnetic type of energy meters fitted in EB feeders in CSEZA are replaced with more accurate electronic energy meters/ Trivector meters for accurate measurement of energy consumption. CSEZA has 2 No.s of power transformers in

110/11kV substation and over 13 distribution transformers in service inside the campus which are installed by CSEZA/ other co-developers. Considerable amount of energy losses has been observed in these transformers. Also, losses occur in UG cables and other LT cables, switchgear equipment etc. however it is low compared with the transformation losses. True losses in percentage and input energy for different years are given below:

Table 12: Details of total T&D Losses for 2020-21, 2021-22 and 2022-23

T&D Losses analysis for 2020-21				T&D Losses analysis for 2021-22				T&D Losses analysis for 2022-23			
Input energy (MU)	Metered Energy (MU)	Total Energy Loss (MU)	T&D losses %	Input energy (MU)	Metered Energy (MU)	Total Energy Loss (MU)	T&D losses %	Input energy (MU)	Metered Energy (MU)	Total Energy Loss (MU)	T&D losses %
51.01	50.36	0.64	1.27%	55.47	54.67	0.79	1.44%	57.32	56.41	0.91	1.587%

Figure 3: Total Yearly T&D Loss in MU for 2020-21, 2021-22 & 2022-23

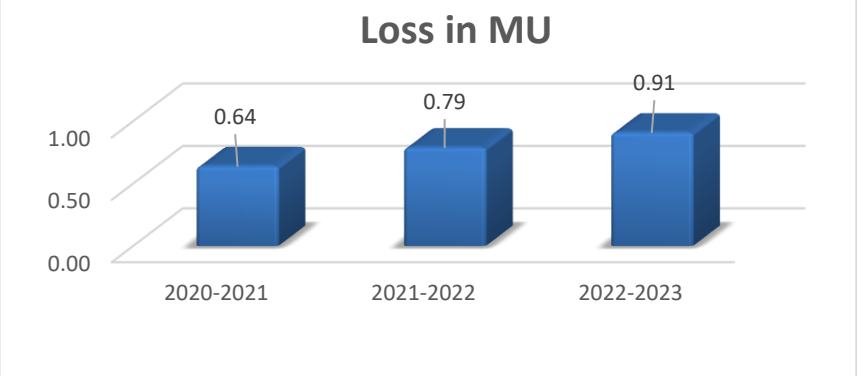


Figure 4: Total Yearly T&D Loss in % for 2020-21, 2021-22 & 2022-23

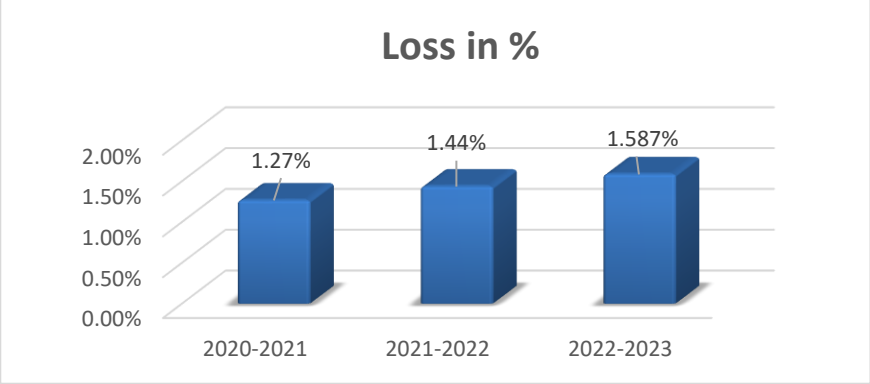


Table 13: Details of AT&C Loss

Financial Year	Input Energy (MU)	Billing Efficiency (%)	Collection Efficiency (%)	AT&C Loss (%)
FY 2020-21	51.01	100%	100%	1.27%
FY 2021-22	55.47	100%	100%	1.44%
FY 2022-23	57.32	100%	100%	1.59%

6.8 Random Verification of HT and LT Metering

The BEE Regulations required us to verify and validate the system metering data provided by the metering agency through random meter crosschecking. As per BEE Guidelines, random verification of following 10 energy meters were carried out to find out any anomaly in metering and we found that all the meters were functioning as per the designed accuracy level.

Table 14: Observations in the Randomly Checked Energy Meters

Sl. No.	Consumer Name	Consumer Category
1	SFO Technologies P37	HT
2	Beta Health Care Products Ltd.	HT
3	Asma Rubber Products Pvt Ltd	LT
4	Amy Export and Import Pvt. Ltd	LT
5	Wrench solutions Pvt Ltd	LT
6	Clairon Filters	LT
7	Steripharm	LT
8	Bommidala	LT
9	Immucare Diagnostics Pvt Ltd.	LT
10	Globalwave Technologies	LT

➢ Losses in Distribution Network:

The losses in a distribution network are classified into three categories i.e. Technical & Distribution (T&D) Loss, Technical Loss and Commercial loss.

I. T&D loss is the difference between energy supplied to a network and the total energy billed. It includes both technical & commercial loss.

T&D Loss= Input Energy to the System – Energy Billed to the Consumer

Distribution (T&D) Loss= Input Energy Supplied to DISCOM system (-) Energy Billed to consumer by DISCOM

%Distribution (T&D) Loss= [Input Energy (-) Energy Billed] x 100 ÷ [Input Energy]

II. Technical loss or line loss occurs mainly due to the heating effects, loose bindings, earthing problem, unbalancing, inadequate size of conductors, shifting of load centre, low power factor/reactive losses etc. This loss is difficult to calculate, and the most accurate method is the load flow study using network analysis software.

The Technical loss in the system comprises of the following:

- 11kV Line losses
- 110KV Transformer Losses(Iron & Copper Losses)
- Distribution transformer losses(Iron & Copper losses)
- LT Line losses
- Miscellaneous technical losses
- Losses due to lose jump connections in the line
- Losses due to short circuits & earth faults
- Losses in service mains of installations.
- Losses in ocurred in CT'S & current coils of energy meters.

III. Commercial loss is the difference between T&D loss and Technical loss

Commercial Loss=Distribution Loss (-) Technical Loss

The commercial losses comprises of the following:

- Mistakes in the billing.
- Meters not recording (MNR)
- Meters not recording correctly
- Meters bypassed due to defects / intentionally
- Meters not read & billed.
- Theft and pilferage.
- Inadequate methodology in assessment power consumption of unmetered consumers.

T&D Loss Calculation:

Overall T&D Loss of DISCOM = 1 - (Total Energy sale to consumer including EHT, HT and LT in MU / Total Energy input in MU)

Aggregate Technical & Commercial (AT&C) Loss:

Aggregate Technical & Commercial Loss (AT&C Loss) is defined as the summation of all technical as well as commercial power loss that occurs due to electrical power flow through sub-transmission and distribution network. Technical Loss is defined as the summation of power loss through 11 kV line and LT line loss including transformer loss and others. Commercial loss is defined as the summation of power loss occurring due to theft/ pilferage, deficient meter, inefficiency in billing& unrealized revenue due to collection inefficiency.

Computation of AT&C Loss:

Aggregate Technical & Commercial Loss (AT&C) is computed from the actual meter readings of the meter installed at various locations in the system.

Overall Billing Efficiency (%) = Total Sale in MU/Total input in MU

Overall Collection Efficiency (%) = Total Collection Received (Rs. in Crs.) / Total Billing to Consumers (Rs. in Crs.)

AT&C Loss (%) = 1- {Collection Efficiency (%) x Billing Efficiency (%)}

6.9 Measuring Equipment and Instrument Calibration

The quantity of electrical power and energy supplied is by KSEBL (Kerala State electricity Board Limited), at the inter connection point by means of a main meter and check meter, the installed meters are amended time to time as per the CEA regulations, 2006. The campus is installed TOD meter for billing analysis. The check meter is connected to the same core of the current transformer (CT) and voltage transformer (VT). The check meter is used for accounting and billing of electricity in case the main meter fails. The main meters, check meters, transformers is of the minimum standards specified in the CEA Regulations, 2006. The meters are periodically calibrated by KSEBL or approved third party labs. The periodicity of the calibration abides the time frame mentioned by the CEA Regulation 2006.

The meter has the provision to register the average power factor for the reference period as well as the instantaneous power factor. The average monthly power factor is determined by the ratio of monthly kWh and KVAh. The brief history, date of installation and testing, calibration and replacement of meters have all been maintained by CSEZA.

6.10 List of documents verified with each parameter

Table 15: List of Documents Verified

Sl. No.	Particular	Document Verified
A	**Summary of Energy Input and Infrastructure**	
A.1	Purchased Energy Details	Power sales and purchase report
A.2	Transmission and Distribution loss %	ARR
A.3	T&D loss in (MU)	ARR
A.4	Energy sold outside the periphery	ARR
A.5	Open access sale	ARR
A.6	EHT sale	ARR
A.7	Net Input Energy (received at DISCOM periphery, after adjustment) in MU	ARR
A.8	Verification of 100% metering at 66/33 kV voltage level	ARR
A.9	Verificationof100% metering at 11kVvoltagelevel	ARR
A.10	% of metering at DT level	ARR
A.11	% of metering at consumer end	ARR
A.12	Number of feeders at 66kV voltage level (if any)	ARR
A.13	Number of feeders at 33kV voltage level (if any)	ARR
A.14	Number of feeders at 11kV voltage level	ARR
A.15	Number of LT feeders	ARR
A.16	Length at of 66kV voltage level (ckt. kms)	ARR
A.17	Length at of 33kV voltage level (ckt. kms)	ARR
A.18	Length at of 11kV voltage level (ckt. kms)	ARR
A.19	Length at LT level (ckt. kms)	ARR
A.20	HT/LT ratio	ARR
B	**Meter reading of input energy injection points**	
B.1	Energy input details meter wise, with other mentioned details	Tariff order, Tariff petition, ARR
B	**Meter reading of input energy injection points**	
B.2 - B.1000	Energy input details meter wise, with other mentioned details of all input energy injections points	Tariff order, Tariff petition, ARR
C	**Summary of Circle wise losses**	
C.1	Metered consumers category wise of that circle only	Tariff order, Tariff petition, ARR
C.2	Un-metered consumers category wise of that circle only	Tariff order, Tariff petition, ARR
C.3	Connected load of metered consumers category wise of each	Tariff order, Tariff petition, ARR

Sl. No.	Particular	Document Verified
C.4	Connected load of un-metered consumers category wise of each circle	Tariff order, Tariff petition, ARR
C.5	Please enter input energy of the circle only	Tariff order, Tariff petition, ARR
C.6	Billed metered energy category wise of each circle	Tariff order, Tariff petition, ARR
C.7	Billed un-metered energy category wise of each circle	Tariff order, Tariff petition, ARR

6.11 Details of analysis (As per clause 8 in scope of work of RfP)

- CSEZA summary details as per 2022-23 is total Input purchased energy is 57.32 MU and Details of total Energy billed or sale is 56.41 MU and transmission losses is 1.59% .
- The major network system includes Length of 11 kV Line (12.88 ckt. km.), Length of LT Line (10.70 ckt km.), Length of Underground Cable Line (23.59 ckt km.) and 100% metering available at both DT and consumer end.
- As of the financial year 2022-23 data, CSEZA has 163 number consumers with a cumulative connected load of 19.43 MW and 56.41 MU Billed energy, which is also, 100% metered from consumer end. The Agricultural category accounts for 1 number of consumer with a connected load of 0.33 MW and billed energy of 1.38 MU. The commercial LT category accounts for 113 number of consumers with a connected load of 6.02 MW and billed energy of 9.53 MU. The commercial HT category accounts for 25 no .of consumers with a cumulative connected load of 12.76 MW and billed energy of 44.94 MU. The Others category accounts for 24 no .of consumers with a cumulative connected load of 0.31 MW and billed energy of 0.54 MU.
- The overall T&D Loss of CSEZA is 0.91 MU, and 1.59% in 2022-23 Financial year.

6.12 Revenue collection and efficiency:

As per the ARR-ERC document submitted to the Kerala State Electricity Regulatory Commission, the collection efficiency for metered installations is >95%. The collection efficiency observed is >95% for most of the category of consumers. The collection efficiency for the period 2022-23 is as follows:

Table 16: Collection Efficiency HT and LT Category wise for FY 22-23

Sl. No.	Category	Collection %
1	**2**	**3**
1	HT- I(A)	100.00
2	HT- I(B)	100.00
3	HT- III(B)	100.00
	HT Total	**100.00**
1	LT- IV(A)	100.00
2	LT- IV(B)	100.00
3	LT- VI(A)	100.00
4	LT- VI(B)	100.00
5	LT- VI(C)	100.00
6	LT- VI(F)	100.00
7	LT- VII(A)	100.00
8	LT- VII-(A)	100.00
9	LT- VII(C)	100.00
10	LT- VIII(B)	100.00
	LT Total	**100.00**
	Grand Total	**100.00**

6.13 Sectoral study to cover all objectives as per Technical scope (3b) of RfP.

CSEZA summary details as per 2022-23 is total Input purchased energy is 57.32 MU and Details of total Energy billed or LT/HT sale is 56.41 MU and T&D losses is 1.59%. CSEZA has conducted energy audit of its campus and taken some remedial measures for reducing energy losses in the high loss-making distribution areas. The compliance in respect of energy audit conducted, with the details of analysis and the remedial action initiated to reduce loss levels has been sent to the Kerala State Electricity Regulatory Commission.

6.14 Various Initiatives and Energy Efficiency Schemes

Several initiatives have been taken up to strengthen and stabilize the distribution system at CSEZA. A bird's eye view of some of the major achievements and the innovative initiatives under taken by CSEZA are as follows:

- <u>Replacing of all conventional energy into Smart/Prepaid meters</u>

  CSEZA has successfully replaced all the conventional energy meters installed in their premises with smart/prepaid meters over a period of three years. This initiative has greatly enhanced the effectiveness of reducing overall Aggregate Technical and Commercial (AT&C) losses by providing more flexibility in reading, monitoring, and controlling energy consumption. The installation of smart meters has improved the

accuracy and efficiency of recording and monitoring energy usage, allowing consumers to make informed decisions about their consumption patterns. Moreover, the advanced monitoring capabilities of the smart meters have enabled prompt detection and resolution of theft, tampering, or technical losses, contributing to a more efficient and reliable energy distribution system. Overall, the replacement of conventional meters with smart meters in CSEZA premises has successfully improved efficiency, reduced AT&C losses, and empowered consumers to manage their energy usage effectively.

- Replacing Faulty Fluorescent Tubes with LED Tubes in CSEZA Premises

CSEZA is taking proactive steps to enhance energy efficiency and improve lighting quality within its premises by replacing faulty fluorescent tubes with LED tubes. This initiative aims to optimize energy consumption, reduce maintenance costs, and provide a better lighting experience for employees, visitors, and the community. CSEZA's initiative to replace faulty fluorescent tubes with LED tubes demonstrates its commitment to energy efficiency, cost reduction, and creating a better environment for all stakeholders. By embracing LED technology, CSEZA enhances lighting quality, reduces energy consumption, and contributes to a greener and more sustainable future. This transition is a significant step towards achieving CSEZA's goal of implementing innovative and sustainable solutions throughout its premises.

6.15 Average Billing Rate (ABR):

ABR for a consumer category is determined by dividing total expected revenue from the category by total expected sale to that category. Mathematically, it can be represented as:

$$ABR\ of\ a\ category\ of\ consumer = \frac{\text{Total Expected Revenue from a Category}}{\text{Total Sale of Power to that Category}}$$

Table 17: Average Billing Rate for Financial Years 2020-2023

	FY 2020-21	FY 2021-22	FY 2022-23
Average Billing Rate (Rs.)	7.25	7.13	7.38
Agricultural Consumers	4.50	4.19	4.42
LT Consumers	8.82	8.22	8.27
HT Consumers	7.09	6.95	7.24
Other Consumers	0	10.02	10.90

7. CONCLUSIONS

The data from DC has been collected for the financial year 2022-23 for data generation. The key performance findings are:

- As of Financial year 2022-23, CSEZA has a total number of 163 consumer in four numbers of consumer category, which is 1 number of Agricultural consumer, 113 number of Commercial/Industrial - LT consumer, 25 number of Commercial/Industrial-HT consumer and 24 number of Other consumer categories.
- The Input energy purchased for the FY 2022-23 is 57.32 Million KWh.
- The Total Energy Billed (is the Net energy billed, adjusted for energy traded) for the FY 2022-23 is 56.41 Million KWh.
- The Technical and Distribution (T&D) losses are 0.91 Million (1.59%) KWh for FY 2022-23.

The Verification Audit is completed as per PAT Rules and guidelines issued by BEE using the latest DISCOM specific pro forma filled by DC and KSPC team and sent to SDA / BEE for further review and acceptance.

ANNEXURES

General Information

1	**Name of the DISCOM**	Cochin Special Economic Zone Authority (CSEZA)		
2	**i) Year of Establishment**	2009		
	ii) Government/Public/Private	Government		
3	**DISCOM's Contact details & Address**			
i	City/Town/Village	Kakkanad		
ii	District	Ernakulam		
iii	State	Kerala	Pin	682037
iv	Telephone	0484-2413111	Fax	0484-2413074
4	**Registered Office**			
i	Company's Chief Executive Name	**Hemalatha P IAS**		
ii	Designation	Development Commisioner & Chairman CSEZ Authority		
iii	Address	Cochin Special Economic Zone Authority (CSEZA), Ministry of		
iv	City/Town/Village	Kakkanad	P.O.	CSEZ
v	District	Ernakulam		
vi	State	Kerala	Pin	682037
vii	Telephone	0484 2413222	Fax	0484-2413074
5	**Nodal Officer Details***			
i	Nodal Officer Name (Designated at DISCOM's)	PRAMODU S		
ii	Designation	Secretary-in-Charge		
iii	Address	Cochin Special Economic Zone Authority (CSEZA), Ministry of		
iv	City/Town/Village	Kakkanad	P.O.	CSEZ
v	District	Ernakulam		
vi	State	Kerala	Pin	682037
vii	Telephone	0484 2413222	Fax	0484-2413074
6	**Energy Manager Details***			
i	Name	RATHEESH KUMAR A		
ii	Designation	Energy Manager	Whether EA or EM	EM
iii	EA/EM Registration No.	EM 5037		
iv	Telephone		Fax	
v	Mobile	9744962260	E-mail ID	ratheeshkumar.a@gmail.com
7	**Period of Information**			
	Year of (FY) information including Date and Month (Start & End)	1st April 2022 to 31st March 2023		

Performance Summary of Electricity Distribution Companies			
1	Period of Information Year of (FY) information including Date and Month (Start & End)	1st April 2022 to 31st March 2023	
2	**Technical Details**		
(a)	**Energy Input Details**		
(i)	Input Energy Purchase (From Generation Source)	Million kwh	57.32
(ii)	Net input energy (at DISCOM Periphery after adjusting the transmission losses and energy traded)	Million kwh	57.32
(iii)	Total Energy billed (is the Net energy billed, adjusted for energy traded))	Million kwh	56.41
(b)	Transmission and Distribution (T&D) loss Details	Million kwh	0.91
		%	1.59%
	Collection Efficiency	%	100%
(c)	Aggregate Technical & Commercial Loss	%	2%

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

Signature:-

Name of Energy Manag RATHEESH KUMAR A

Registration Number: EM-5037

Name of Authorised Signatory

Name of th Cochin Special Economic Zone Authority (CSEZA)

Full Addre: CSEZ Administrative BuildingKakkanad,Ernakulam,Kerala- 682037

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	1	1		
ii	Number of divisions	1	1		
iii	Number of sub-divisions	0	0		
iv	Number of feeders	12	12		From field inspection
v	Number of DTs	13	13		From field inspection
vi	Number of consumers	163	163	10	From field inspection
2	**Parameters**	**66kV and above**	**33kV**	**11/22kV**	**LT**
a. i.	Number of conventional metered consumers		0	0	7
ii	Number of consumers with 'smart' meters		0	0	0
iii	Number of consumers with 'smart prepaid' meters		0	0	0
iv	Number of consumers with 'AMR' meters		0	0	0
v	Number of consumers with 'non-smart prepaid' meters		0	26	130
vi	Number of unmetered consumers		0	0	0
vii	**Number of total consumers**		0	26	137
b.i.	Number of conventionally metered Distribution Transformers		0	1	
ii	Number of DTs with communicable meters		0	0	0
iii	Number of unmetered DTs		0	12	
iv	**Number of total Transformers**		0	13	0
c.i.	Number of metered feeders		0	12	0
ii	Number of feeders with communicable meters		0	0	0
iii	Number of unmetered feeders		0	0	0
iv	**Number of total feeders**		0	12	0
d.	Line length (ct km)	23.592			
e.	Length of Aerial Bunched Cables	0			
f.	Length of Underground Cables	0			

3	Voltage level	Particulars	MU	Reference	Remarks (Source of data)
i	66kV and above	Long-Term Conventional	56	Includes input energy for franchisees	Power input from KSEBL at 110 KV
		Medium Conventional	0		
		Short Term Conventional	0		
		Banking	0		
		Long-Term Renewable energy	0		
		Medium and Short-Term RE	0	Includes power from bilateral/ PX/ DEEP	
		Captive, open access input	0	Any power wheeled for any purchase other than sale to DISCOM. Does not include input for franchisee.	
		Sale of surplus power	0		
		Quantum of inter-state transmission loss	0	As confirmed by SLDC, RLDC etc	
		Power procured from inter-state sources	56	Based on data from Form 5	
		Power at state transmission boundary	56		
ii	33kV	Long-Term Conventional	0		
		Medium Conventional	0		
		Short Term Conventional	0		
		Banking	0		
		Long-Term Renewable energy	0		
		Medium and Short-Term RE	0		
		Captive, open access input	0		
		Sale of surplus power	0		
		Quantum of intra-state transmission loss	0		
		Power procured from intra-state sources	0		
iii		**Input in DISCOM wires network**	56		
iv	33 kV	Renewable Energy Procurement	0		
		Small capacity conventional/ biomass/ hydro plants Procurement	0		
		Captive, open access input	0		
v	11 kV	Renewable Energy Procurement	0		
		Small capacity conventional/ biomass/ hydro plants Procurement	0		
		Sales Migration Input	0		
vi	LT	Renewable Energy Procurement	1.318927		
		Sales Migration Input	0		
vii		**Energy Embedded within DISCOM wires network**	1.318927		
viii		**Total Energy Available/ Input**	57		

4	Voltage level	Energy Sales Particulars	MU	Reference	
i	LT Level	DISCOM' consumers	11.467482	Include sales to consumers in franchisee areas, unmetered consumers	
		Demand from open access, captive	0	Non DISCOM's sales	
		Embedded generation used at LT level	0	Demand from embedded generation at LT level	
		Sale at LT level	11		
		Quantum of LT level losses	0		
		Energy Input at LT level	11.65244108		
ii	11 kV Level	DISCOM' consumers	44.947281	Include sales to consumers in franchisee areas, unmetered consumers	
		Demand from open access, captive	0	Non DISCOM's sales	
		Embedded generation at 11 kV level used	0	Demand from embedded generation at 11kV level	
		Sales at 11 kV level	45		
		Quantum of Losses at 11 kV	1		
		Energy input at 11 kV level	45.67223592		
iii	33 kV Level	DISCOM' consumers	0	Include sales to consumers in franchisee areas, unmetered consumers	
		Demand from open access, captive	0	Non DISCOM's sales	
		Embedded generation at 33 kV or below level	0	This is DISCOM and OA demand met via energy generated at same voltage level	
		Sales at 33 kV level	0		
		Quantum of Losses at 33 kV	0		
		Energy input at 33kV Level	0		
iv	> 33 kV	DISCOM' consumers	0	Include sales to consumers in franchisee areas, unmetered consumers	
		Demand from open access, captive	0	Non DISCOM's sales	
		Cross border sale of energy	0		
		Sale to other DISCOMs	0		
		Banking	0		
		Energy input at > 33kV Level	0		
		Sales at 66kV and above (EHV)	0		
		Total Energy Requirement	**57**		
		Total Energy Sales	**56**		

Energy Accounting Summary					
5	**DISCOM**	**Input (in MU)**	**Sale (in MU)**	**Loss (in MU)**	**Loss %**
i	LT	1	11		
ii	11 Kv	0	45		
iii	33 kv	0	0		
iv	> 33 kv	56	0	1	0.01587299
6	**Open Access, Captive**	**Input (in MU)**	**Sale (in MU)**	**Loss (in MU)**	
i	LT	0	0	0	0
ii	11 Kv	0	0	0	0
iii	33 kv	0	0	0	0
iv	> 33 kv	0	0	0	0

Loss Estimation for DISCOM	
T&D loss	1
D loss	1
T&D loss (%)	0.01587299
D loss (%)	0.01587299

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

Division Wise Losses

Period From 1st April 2022 to 31st March 2023

S.No	Name of circle	Circle code	Name of Division	Consumer profile								Energy parameters					Losses		Commercial Parameter			AT & C loss (%)
				Consumer category	No of connection metered (Nos)	No of connection Un-metered (Nos)	Total Number of connections (Nos)	% of number of connections	Connected Load metered (MW)	Connected Load Un-metered (MW)	Total Connected Load (MW)	% of connected load	Input energy (MU)	Billed energy (MU)			% of energy consumption	T&D loss (MU)	T&D loss (%)	Billed Amount in Rs. Crore	Collected Amount in Rs. Crore	Collection Efficiency	
														Metered energy	Unmetered/assessment energy	Total energy							
1	Cochin Special Economic Zone Authority (CSEZA)	CSEZA	CSEZA	Residential	0	0	0	0%	0	0	0	0%	57.3246	0	0	0	0%	0.909837	2%	0	0	0.00%	
				Agricultural	1	0	1	1%	0.33	0	0.33	2%		1.385495	0	1.385495	2%			0.61306295	0.61306295	100.00%	
				Commercial/Industrial-LT	113	0	113	69%	6.022	0	6.022	31%		9.537111	0	9.537111	17%			7.8910238	7.8910238	100.00%	
				Commercial/Industrial-HT	25	0	25	15%	12.761	0	12.761	66%		44.94728	0	44.947281	80%			32.5614271	32.5614271	100.00%	
				Others	24	0	24	15%	0.318	0	0.318	2%		0.544876	0	0.544876	1%			0.5942404	0.5942404	100.00%	
Sub-total					**163**	**0**	**163**	**100%**	**19.431**	**0**	**19.431**	**100%**	**57.3246**	**56.41476**	**0**	**56.414763**	**100%**	**0.909837**	**2%**	**41.6597542**	**41.6597542**	**100.00%**	**2%**
2				Residential			0	0%		0	0	0%			0	0	0%	0	0%	0	0	0.00%	
				Agricultural			0	0%		0	0	0%			0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT			0	0%		0	0	0%			0	0	0%			0	0	0.00%	
				Commercial/Industrial-HT			0	0%		0	0	0%			0	0	0%			0	0	0.00%	
				Others			0	0%		0	0	0%		0	0	0	0%			0	0	0.00%	
Sub-total					**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**0**	**100%**	**0**	**0%**	**0**	**0**	**0.00%**	**100%**
3				Residential			0	0%		0	0	0%			0	0	0%	0	0%	0	0	0.00%	
				Agricultural			0	0%		0	0	0%			0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT			0	0%		0	0	0%			0	0	0%			0	0	0.00%	
				Commercial/Industrial-HT			0	0%		0	0	0%			0	0	0%			0	0	0.00%	
				Others			0	0%		0	0	0%			0	0	0%			0	0	0.00%	
Sub-total					**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**0**	**100%**	**0**	**0%**	**0**	**0**	**0.00%**	**100%**
4				Residential		0	0	0%		0	0	0%			0	0	0%	0	0%	0	0	0.00%	
				Agricultural		0	0	0%		0	0	0%			0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT		0	0	0%		0	0	0%			0	0	0%			0	0	0.00%	
				Commercial/Industrial-HT		0	0	0%		0	0	0%			0	0	0%			0	0	0.00%	
				Others		0	0	0%		0	0	0%			0	0	0%			0	0	0.00%	
Sub-total					**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**0**	**100%**	**0**	**0%**	**0**	**0**	**0.00%**	**100%**
5				Residential	0	0	0	0%	0	0	0	0%	0	0	0	0	0%	0	0%	0	0	0.00%	
				Agricultural	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-HT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Others	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
Sub-total					**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**0**	**100%**	**0**	**0%**	**0**	**0**	**0.00%**	**100%**
6				Residential	0	0	0	0%	0	0	0	0%	0	0	0	0	0%	0	0%	0	0	0.00%	
				Agricultural	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-HT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Others	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
Sub-total					**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**0**	**100%**	**0**	**0%**	**0**	**0**	**0.00%**	**100%**
7				Residential	0	0	0	0%	0	0	0	0%	0	0	0	0	0%	0	0%	0	0	0.00%	
				Agricultural	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-HT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Others	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
Sub-total					**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**0**	**100%**	**0**	**0%**	**0**	**0**	**0.00%**	**100%**
8				Residential	0	0	0	0%	0	0	0	0%	0	0	0	0	0%	0	0%	0	0	0.00%	
				Agricultural	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-HT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Others	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
Sub-total					**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**0**	**100%**	**0**	**0%**	**0**	**0**	**0.00%**	**100%**
9				Residential	0	0	0	0%	0	0	0	0%	0	0	0	0	0%	0	0%	0	0	0.00%	
				Agricultural	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-HT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Others	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
Sub-total					**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**0**	**100%**	**0**	**0%**	**0**	**0**	**0.00%**	**100%**
10				Residential	0	0	0	0%	0	0	0	0%	0	0	0	0	0%	0	0%	0	0	0.00%	
				Agricultural	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-HT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Others	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
Sub-total					**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**0**	**100%**	**0**	**0%**	**0**	**0**	**0.00%**	**100%**
11				Residential	0	0	0	0%	0	0	0	0%	0	0	0	0	0%	0	0%	0	0	0.00%	
				Agricultural	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-HT	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Others	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	

110				Residential	0	0	0	#DIV/0!	0	0	0	#DIV/0!	0	0	0	0	#DIV/0!	0	0%	0	0	0.00%	
				Agricultural	0	0	0	#DIV/0!	0	0	0	#DIV/0!		0	0	0	#DIV/0!			0	0	0.00%	
				Commercial/Industrial-LT	0	0	0	#DIV/0!	0	0	0	#DIV/0!		0	0	0	#DIV/0!			0	0	0.00%	
				Commercial/Industrial-HT	0	0	0	#DIV/0!	0	0	0	#DIV/0!		0	0	0	#DIV/0!			0	0	0.00%	
				Others	0	0	0	#DIV/0!	0	0	0	#DIV/0!		0	0	0	#DIV/0!			0	0	0.00%	
Sub-total					**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**100%**	**0**	**0**	**0**	**0**	**100%**	**0**	**0%**	**0**	**0**	**0.00%**	**100%**
76	Total			Residential	0	0	0	0%	0	0	0	0%	57.3246	0	0	0	0%	0.909837	2%	0	0	0.00%	
				Agricultural	1	0	1	1%	0.33	0	0.33	2%		1.385495	0	1.385495	2%			0.61306295	0.61306295	100.00%	
				Commercial/Industrial-LT	113	0	113	69%	6.022	0	6.022	31%		9.537111	0	9.537111	17%			7.8910238	7.8910238	100.00%	
				Commercial/Industrial-HT	25	0	25	15%	12.761	0	12.761	66%		44.94728	0	44.947281	80%			32.5614271	32.5614271	100.00%	
				Others	24	0	24	15%	0.318	0	0.318	2%		0.544876	0	0.544876	1%			0.5942404	0.5942404	100.00%	
77	**At company level**				**163**	**0**	**163**	**100%**	**19.431**	**0**	**19.431**	**100%**	**57.3246**	**56.41476**	**0**	**56.414763**	**100%**	**0.909837**	**2%**	**41.6597542**	**41.6597542**	**100.00%**	**2%**

**** Note - It shall be mandatory to record the energy supplied separately for each category of consumers which is being provided a separate rate of subsidy in the tariff, by the state government, so that the subsidy due for the electricity distribution company is quarterly calculated by multiplying the energy supplied to each of such category of consumers by the applicable rate of subsidy notified by the state government.**

Color code	Parameter
	Please enter name of circle
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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

Signature:-
Name of Energy Manager:
Registration Number:

Name of Authorised Signatory:

Name of the DISCOM:
Full Address:-

Seal

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

A. Summary of energy input & Infrastructure

S.No	Parameters	Period From 1st April 2022 to 31st March 2023	Remarks (Source of data)
A.1	Input Energy purchased (MU)	57.324677	KSEBL = 56MU, Solar generation=1.32 MU
A.2	Transmission loss (%)	2%	
A.3	Transmission loss (MU)	0.909838222	
A.4	Energy sold outside the periphery(MU)	0	
A.5	Open access sale (MU)	0	
A.6	EHT sale	0	
A.7	Net input energy (received at DISCOM periphery or at distribution point)-(MU)	57.32	
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)	Yes	
A.10	% of metering available at DT	100%	
A.11	% of metering available at consumer end	100%	
A.12	No of feeders at 66kV voltage level	Nil	
A.13	No of feeders at 33kV voltage level	Nil	
A.14	No of feeders at 11kV voltage level	12	
A.15	No of LT feeders level	NA	
A.16	Line length (ckt. km) at 66kV voltage level	0	
A.17	Line length (ckt. km) at 33kV voltage level	0	
A.18	Line length (ckt. km) at 11kV voltage level	12.884	
A.19	Line length (km) at LT level	10.708	
A.20	Length of Aerial Bunched Cables	0	
A.21	Length of Underground Cables	23.592	HT and LT Cables are underground
A.22	HT/LT ratio	1.203212551	Ratio of HT cable to LT cable

B. Meter reading of Input energy at injection points

S.No	Zone	Circle	Voltge 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	Feeder Type (Agri/ Industrial/Mixed)	Status of Communication			Period from...to...				Sales	Remarks (Source of data)	
										Date of last actual meter reading/ communication		% data received through automatically if feeder AMR/AMI	Number of hours when meter was unable to communicate in period	Total Number of hours in the period	Meter S.No	CT/PT ratio	Import (MU)	Export (MU)			
B.1	CSEZA	CSEZA	110 kV	110 kV	No feeder ID. Feeders are identifie		110kV Incomer	Metered	Functional	31.03.2023	Mixed	NA	NA	NA	KSB94627	CT - 90A/1A , PT - 110kV/110V	56.00			CSEZA	
B.2	CSEZA	CSEZA	415 V	415 V	No feeder ID. Feeders are identifie		Solar LT - 1B	Metered	Functional	31.03.2023	Mixed	NA	NA	NA	19009091	CT-300/5.	0.38			CSEZA	
B.3	CSEZA	CSEZA	415 V	415 V	No feeder ID. Feeders are identifie		Solar LT - 2A	Metered	Functional	31.03.2023	Mixed	NA	NA	NA	HA-040700033-03 HA-040700202-03	CT-250/5 CT- 200/5	0.54			CSEZA	
B.4	CSEZA	CSEZA	415 V	415 V	No feeder ID. Feeders are identifie		Solar LT - 2B	Metered	Functional	31.03.2023	Mixed	NA	NA	NA	MX101200657-03	CT-350/5	0.21			CSEZA	
B.5	CSEZA	CSEZA	415 V	415 V	No feeder ID. Feeders are identifie		Solar LT - 3B	Metered	Functional	31.03.2023	Mixed	NA	NA	NA	HA-051001234-03	CT-300/5.	0.19		56.415	CSEZA	
B.6																					
B.7																					
B.8																					
B.9																					
B.10																					
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B.13398																					
B.13399																					
B.13400																					
B.13401	**Total (MU)**																**57.32**	**0.00**			
B.13402	**Net input energy at DISCOM periphery (MU)**																**57.32**				

Color code			Parameter
			Please enter voltage level or leave blank
			Please enter feeder id and name or leave blank
			Enter meter no or leave blank
			Enter CT/PT ratio or leave blank
0			Please enter numeric value or 0
			Please select yes or no from list
			Formula protected

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

Signature:-
Name of Energy Manager*:
Registration Number:

Name of Authorised Signatory
Name of the DISCOM:
Full Address:-

Seal

Details of Input Energy Sources

Period From 1st April 2022 to 31st March 2023

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	Nil	Nil	Nil	Nil	Nil	Nil	Nil	from KSEBL at 110

B. Embedded Generation in DISCOM Area

S.No	Name of Generation Station	Generation Capacity (In MW)	Tytpe of Station (Generation Based-Solid/Liquid/Gas/Renewable/Others)	Type of Contract	Type of Grid	Voltage Level (KVA)	Circle Load (MW)	Received at Circle (KVA)	Received at Circle (In MU)	Division Level Load (MW)	Received at Division Level (KVA)	Received at Division Level (In MU)	Sub-Division Level Load (MW)	Received at Sub-Division Level (KVA)	Received at Sub-Division Level (In MU)	Remarks (Source of data)
1	ON Grid Tied Roof Top Solar Plant at SDF-43	0.168	Renewable Solar Grid		Self generate source	415 V			0.193031							CSEZA's Solar generation plants were installed by CSEZA on Capex Model and hence no Contract is available. Also CSEZA being a small DISCOM operating in a single location, there is no separate Circle, Division and Sub Division.
2	ON Grid Tied Roof Top Solar Plant at SDF-16	0.204	Renewable Solar Grid		Self generate source	415 V			0.206431							
3	ON Grid Tied Roof Top Solar Plant atSDF-17 -1	0.144	Renewable Solar Grid		Self generate source	415 V			0.110622							
4	ON Grid Tied Roof Top Solar Plant atSDF-17 -2	0.120	Renewable Solar Grid		Self generate source	415 V			0.133535							
5	ON Grid Tied Solar Plant at Ground mounted	0.363	Renewable Solar Grid		Self generate source	415 V			0.37882							
6	ON Grid Tied Roof Top Solar Plant at Ware House SDF-17	0.290	Renewable Solar Grid		Self generate source	415 V			0.296322							
	Total								1.318761							

(Details of Consumers)						
Summary of Energy						
Period From 1st April 2022 to 31st March 2023						
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					
2	Commercial	LT	415	18	0.222	
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					
8	Public Lighting	LT	415	1	0.077	
9	HT Water Supply					
10	HT Industrial	HT	11000	25	44.947	
11	Industrial (Small)					
12	Industrial (Medium)	LT	415	95	9.314	
13	HT Commercial					
14	Applicable to Government Hospitals & Hospitals					
15	Lift Irrigation Schemes/Lift Irrigation Societies					
16	HT Res. Apartments Applicable to all areas					
17	Mixed Load					
18	Government offices and department					
19	HT Agricultural	HT	11000	1	1.385	
20	Others-2 (if any , specify in remarks)	LT	415	23	0.469	
21	Others-3 (if any , specify in remarks)					
22	Others-4 (if any , specify in remarks)					
23	Others-5 (if any , specify in remarks)					
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
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35						
36						
37						
38						
39						
40						
				Total	163	56.41

(Details of Feeder-wise losses)

Period From 1st April 2022 to 31st March 2023

Sl No.	Zone	Received at Circle (In MU)	Received at Division (In MU)	Received at Sub-division (In MU)	Name of the Station	Feeder Code/ID	Feeder Name	Type of Feeder (Urban/Mixed/Industrial/Agricultural/Rural)	Type of feeder meter (AMI/AMR/Other)	Received at Feeder (Final in MU)	Feeder Consumption (In MU)	Final Net Export at Feeder Level (In MU)	T&D losses	AT&C losses	% Data Received through Automatically (if feeder AMR/AMI)	Remarks
1	CSEZA	56.00175	56.00175	56.00175	CSEZA 110kV SS		110 kV Incomer	Urban-Mixed	AMR	56.002	55.667	0.000	0.006	0.032		There are no Feeder IDs /Codes
2																
3							11 KV Out going									
4	CSEZA	1.550873588	1.550873588	1.551	Within CSEZA Zone		Ring 1A	Urban-Mixed	Others	1.553	1.520	0.000	0.021	0.019		
5	CSEZA	3.392684482	3.392684482	3.393	Within CSEZA Zone		Ring 1B + Solar Gen 0.102M	Urban-Mixed	Others	3.638	3.584	0.000	0.015	0.034		
6	CSEZA	5.33435	5.33435	5.334	Within CSEZA Zone		Ring 2A + Solar Gen 0.147M	Urban-Mixed	Others	5.713	5.621	0.000	0.016	0.034		
7	CSEZA	6.45855	6.45855	6.459	Within CSEZA Zone		Ring 2B + Solar Gen 0.057M	Urban-Mixed	Others	6.671	6.567	0.000	0.016	0.031		
8	CSEZA	6.339213	6.339213	6.339	Within CSEZA Zone		Ring 3A	Urban-Mixed	Others	6.365	6.271	0.000	0.015	0.027		
9	CSEZA	8.635978	8.635978	8.636	Within CSEZA Zone		Ring 3B + Solar Gen 0.056 M	Urban-Mixed	Others	8.854	8.722	0.000	0.015	0.031		
10	CSEZA	6.482109143	6.482109143	6.482	Within CSEZA Zone		WFB Baird & Company	Urban industrial	Others	6.455	6.396	0.000	0.009	0.039		
11	CSEZA	3.450229065	3.450229065	3.45	Within CSEZA Zone		Muthoot Technopolis	Urban industrial	Others	3.432	3.407	0.000	0.007	0.018		
12	CSEZA	8.291433049	8.291433049	8.291	Within CSEZA Zone		SFO technoligies	Urban industrial	Others	8.274	8.220	0.000	0.007	0.031		
13	CSEZA	6.139982568	6.139982568	6.14	Within CSEZA Zone		Carborandum Universal L	Urban industrial	Others	6.126	6.086	0.000	0.007	0.017		
14	CSEZA	0.019752	0.019752	0.019752	Within CSEZA Zone		Auxilury Transformer	Urban industrial	Others	0.019838	0.0196	0.000	0.013	0.000		
15	0					0	0			0	0.00		0%			
16	0					0	0			0	0.00		0%			
17	0					0	0			0	0.00		0%			
18	0					0	0			0	0.00		0%			
19	0					0	0			0	0.00		0%			
20	0					0	0			0	0.00		0%			
21	0					0	0			0	0.00		0%			
22	0					0	0			0	0.00		0%			
23	0					0	0			0	0.00		0%			
24	0					0	0			0	0.00		0%			
25	0					0	0			0	0.00		0%			
26	0					0	0			0	0.00		0%			
27	0					0	0			0	0.00		0%			
28	0					0	0			0	0.00		0%			
29	0					0	0			0	0.00		0%			
30	0					0	0			0	0.00		0%			
31	0					0	0			0	0.00		0%			
32	0					0	0			0	0.00		0%			
33	0					0	0			0	0.00		0%			
34	0					0	0			0	0.00		0%			
35	0					0	0			0	0.00		0%			
36	0					0	0			0	0.00		0%			
37	0					0	0			0	0.00					

Details of DT-wise losses (please add more rows as per requirement)

Zone Name	Circle name	Division name	Name of the Sub-division	Name of the Sub-station	Substation Code	Name of the 11 kV Feeder	Feeder Code	Name of the Location where DT situated	DT code	DT Capacity (kVA)	Predominant consumer type of DT (Domestic/Industrial/Agriculture/Mixed)	Type of metering AMR/AMI/ Communicable/Conventional metered/Unmetered	Status of Meter- whether Functional (Yes/No)	% of data received automatically (if AMR/AMI)	No. of Connected Consumers	Input Energy (MU) (A)	Billed Energy (MU) (B)	Loss (MU) (A-B)	% DT Loss (A-B)/A	Remarks
CSEZA						Ring-1 B		DT in Ring 1 B		500	Mixed	Unmetered	NA	NA	12		0.04			1.There are no Feeder ID/Codes. Feeders are identified by Feeder name only.Similarly there are no IDs /Codes for DTs and DTS are identified by Names only. 2. Since there no meters available for 12 nos DTs, % Loss of DTS can not be provided. CSEZA is planning to provide metering for DTS as BEE regulations and once installed the details can be provided. 3.Since there are no meters for DTS (except for Station auxilsry DT) No data arer received automatically. Also for Station Auxiliary Transformer , available meter is not AMI/AMR type and henece no data are received automatically.
CSEZA						Ring-2 A		DT No1 in SDF 17		1250	Mixed	Unmetered	NA	NA	20		0.11			
CSEZA						Ring-2 A		DT No2 in SDF 17		1250	Mixed	Unmetered	NA	NA	11		0.20			
CSEZA						Ring-2 A		DT in Ware house SDF 17		500	Mixed	Unmetered	NA	NA	10		0.06			
CSEZA						Ring-2 B		DT No1 in SDF 16		400	Mixed	Unmetered	NA	NA	9		0.06			
CSEZA						Ring-2 B		DT No2 in SDF 16		400	Mixed	Unmetered	NA	NA	15		0.08			
CSEZA						Ring-2 B		DT in Ring 2 B		500	Mixed	Unmetered	NA	NA	17		0.12			
CSEZA						Ring-3 A		DT in ZLD Plant		500	Mixed	Unmetered	NA	NA	1		0.05			
CSEZA						Ring-3 A		DT in Plot No 30		630	Mixed	Unmetered	NA	NA	5		0.03			
CSEZA						Ring-3 A		DT in Ring 3 A		500	Mixed	Unmetered	NA	NA	9		0.09			
CSEZA						Ring-3 B		DT in SDF 43		1250	Mixed	Unmetered	NA	NA	23		0.17			
CSEZA						Ring-3 B		DT in WTP		500	Mixed	Unmetered	NA	NA	4		0.05			
CSEZA						Substation Auxilury Transformer feeder		D T for Substation Auxiliary		400	Industrial	Other	Functional	NA	1	0.0268	0.0197	0.007112	26.5	

Annexure - 1 : Proforma for Quarterly Consumer Category-wise Subsidy Billed/Received/Due for period April 2023 to June 2023

S.N.	Division Name	Consumer Category (Separate for each subsidized consumer category)	Billed Energy			Subsidized Billed Energy			Applicable rate of Subsidy as notified by State Govt.		Subsidy Due from State Govt.			Subsidy Actually Billed/claimed from State Govt. (As against col.12)	Subsidy Received from State Govt. (As against col.13)	Balance Subsidy yet to be Received from State Govt.
			Metered	Un-metered*	Total	Metered (out of col.2)	Un-metered* (Out of col.3)	Total	Metered Energy**	Un-metered Energy**	Metered Energy	Un-metered Energy	Total			
			(In kwh)			(In kwh)			(In Rs/Kwh)		(In Rs. Cr.)			(In Rs. Cr.)	(In Rs. Cr.)	(In Rs. Cr.)
		1	2	3	4=2+3	5	6	7=5+6	8	9	10=5x8	11=6x9	12=10+11	13	14	15=13-14
		Residential	0	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Agriculture	1385495	0	1385495	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1		Commercial/Industrial-LT	9537111	0	9537111	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Commercial/Industrial-HT	44947281	0	44947281	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Other (Specify) WW	544876	0	544876	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Total	56414763	**0.00**	**56414763**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
		Residential														
		Agriculture														
2		Commercial/Industrial-LT														
		Commercial/Industrial-HT														
		Other (Specify) WW														
		Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
		Residential														
		Agriculture														
3		Commercial/Industrial-LT														
		Commercial/Industrial-HT														
		Other (Specify) WW														
		Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Total for DISCOM															

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