



# INFOPARKS KERALA

Park Centre, Infopark Kochi P O, Kakkanad, Kochi- 682 042,  
Kerala, India



*Report On*  
**Annual Energy Audit**  
Phase II & Cherthala  
(2022-23)



## KERALA STATE PRODUCTIVITY COUNCIL

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## Acknowledgement

*Kerala State Productivity Council (KSPC) places on records its deep gratitude to the management of **Infoparks Kerala**, Kakkanad, Kochi entrusting us the work of Annual Energy Audit for FY 2022-2023 as per BEE regulations.*

*We would also like to thank the following officials of Infopark, Kakkanad, Kochi 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 the tenure of Annual Energy Audit.*

Officials from Infopark:

Mr. Susanth Kurunthil, Chief Executive Officer

Mr. Vijayan V R, Assistant General Manager- Projects

Mr. Harilal H, Assistant Manager- Projects

Mr. Arun S, Assistant Engineer

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 Composition Team*

Sl No	Name	Qualification	EM/EA/AEA/ EmAEA Registration No	Experience (In Years)
<b>Team Leader</b>				
1	Shanavaz K M	<ul style="list-style-type: none"> <li>• Post-Graduation in Energy Engineering</li> <li>• B.Tech (Electrical &amp; Electronics Engineering)</li> </ul>	Accredited Energy Auditor (AEA-099)	20
<b>Team Members</b>				
2	Richu Zachariah	<ul style="list-style-type: none"> <li>• Post-Graduation in Energy Engineering</li> <li>• B.Tech (Mechanical Engineering)</li> </ul>	Certified Energy Auditor (EA-27720)	5
3	Vishnu T R	<ul style="list-style-type: none"> <li>• B.Tech (Mechanical Engineering)</li> </ul>	-	6
4	Abhijith Narayanan	<ul style="list-style-type: none"> <li>• M.Tech in Power Electronics</li> <li>• B.Tech (Electrical &amp; Electronics Engineering)</li> </ul>	-	3
5	Jithin K Thomas	<ul style="list-style-type: none"> <li>• M.Tech in Energy Management</li> <li>• B.Tech (Electrical &amp; Electronics Engineering)</li> </ul>	-	2
<b>Energy Audit Cell of DISCOM</b>				
6	Vijayan V R	<ul style="list-style-type: none"> <li>• Post-Graduation in Business Administration</li> <li>• B.Tech (Electrical Engineering)</li> </ul>		30
7	Harilal H	<ul style="list-style-type: none"> <li>• B.Tech (Electrical &amp; Electronics Engineering)</li> </ul>		15
8	Arun S	<ul style="list-style-type: none"> <li>• B.Tech (Electrical &amp; Electronics Engineering)</li> </ul>		12

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## **LIST OF ABBREVIATIONS**

A	Ampere
CD	Contract Demand
EPI	Energy Performance Index
Hz	Hertz
HT	High Tension
kVA/ VA	Kilo Volt Ampere/ Volt Ampere
kW/ W	Kilo Watt/ Watt
V	Volt
MU	Million Units
ARR	Aggregate Revenue Requirement
ABR	Average Billing rate

## EXECUTIVE SUMMARY

1. Infoparks Kerala, the IT Park fully owned by the Govt. of Kerala established in 2004 with the objective of creating infrastructural facilities for IT/ITES Companies to operate in the State of Kerala. Infopark is registered as a society under the Travancore-Cochin Literary, Scientific and Charitable Societies Registration Act, 1955 with its main campus at Kakkanad, Ernakulam. In 2004, Government of Kerala has transferred 100 acres of land belongs to KINFRA at Kakkanad to Infoparks Kerala for setting up an IT Park in Kochi. Infopark started operations by renovating the Standard Design Factory (SDF) Building existed in the land transferred by KINFRA. Initially there were only 4 companies and Infopark Project office started functioning. Over a period of years, Infopark has emerged as one of the best well managed IT Parks in the country by attracting investments from various Multi-National Companies.
2. As of Financial year 2022-23, 4 HT consumers (3 in Phase II & 1 in Cherthala), 181 LT Consumers (Phase II- 157 nos. & Cherthala-24 nos.) and 2 station transformer (Phase II- 1 nos. & Cherthala-1 nos) are present in Infopark Phase II & Cherthala campuses. The key energy parameters for the FY2022-23 is shown below:

Table 1: Key energy parameters for the FY2022-23

Particular	Unit	FY 2022-23
Input energy purchase	MU	10.28
Net input energy (at DISCOM Periphery after adjusting the transmission losses and energy traded)	MU	10.28
Total Energy billed (is the Net energy billed, adjusted for energy traded))	MU	9.83
Transmission and Distribution (T&D) loss Details	MU	0.45
	%	4.38%
% of metering available at DT	%	100%
% of metering available at consumer end	%	100%
No of feeders at 66kV voltage level	no.	0
No of feeders at 33kV voltage level	no.	0
No of feeders at 11kV voltage level	no.	9
No. of LT feeders level	no.	0
Line length (ckt.km) at 66 kV voltage level	ckt.km	0
Line length (ckt.km) at 33 kV voltage level	ckt.km	0
Line length (ckt.km) at 11 kV voltage level	ckt.km	4
Line length (km) at LT level	km	1.2
HT/LT ratio	HT:LT	3.33



3. The data from DC has been 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 10.28 Million KWh.
- The Net input energy at DISCOM Periphery after adjusting the transmission losses and energy traded is also the same as input energy purchased for the FY 2022-23 is 10.28 Million KWh.
- The Transmission and Distribution (T&D) losses is 0.45 Million KWh for FY 2022-23 and accounts to 4.38%.

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

## 1. Introduction to Accredited Energy Auditing Firm [EmAEA]

- 1.1. Kerala State Productivity Council (KSPC) is Empaneled Accredited Energy Auditing Firm recognized by BEE. 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 through the use of world-class 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 both in 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 Details
  - 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 1 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) (Equivalent to 86000 MTOE) 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 28 Sept 2020, 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 (36 of 2003)"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, 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 to 103.
- 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
- 2.14. Infoparks, Kochi has designated Mr. Ajin Paul, External Expert & Certified Energy Auditor, BEE in the organization for the BEE activities.
- 2.15. **Introduction of Designated Consumer**
- Sector, Name & Address of DC
    - ✓ DISCOM
    - ✓ Infoparks Kochi, Infopark Park Centre, Near Thapasya Building, Infopark Kochi P O, Kakkanad 682 042
- 2.16. Name and details of energy manager and Authorized signatory of DC

Table 2: Details of Energy Manager & Authorized signatory

General Details	Description
Registered Office address with telephone, fax nos. & e-mail	Mr. Susanth Kurunthil (CEO), Infopark Park Centre, Near Thapasya Building, Infoparks Kochi P O, Kakkanad 682 042
Energy Manager's Name, designation, Registration No., Address, Mobile, Telephone, Fax nos. & e-mail	Mr. Ajin Paul, Certified Energy Auditor Registration Number -EA-29723 Mob.No: 8089217164 ajinpaulonline@gmail.com

- 2.17. About Designated Consumer (DC): Infoparks Kerala, Kochi
- Infoparks Kerala, the IT Park fully owned by the Govt. of Kerala established in 2004 with the objective of creating infrastructural facilities for IT/ITES Companies to operate in the State of Kerala. Infopark is registered as a society under the

Travancore-Cochin Literary, Scientific and Charitable Societies Registration Act, 1955 with its main campus at Kakkanad, Ernakulam. Infopark is one of the power distribution licensee in Kerala as per the regulation amended by Kerala State Electricity Regulatory Commission for power supply distribution to Infopark Phase-2 campus, Kakkanad and Infopark Cherthala campus.

- In 2004, Government of Kerala has transferred 100 acres of land belongs to KINFRA at Kakkanad to Infoparks Kerala for setting up an IT Park in Kochi. Over a period of years, Infopark has emerged as one of the best well managed IT Parks in the country by attracting investments from various Multi-National Companies. Today Infopark has over 323 acres of land area and added more campuses at Koratty in Thrissur district and Cherthala in Alappuzha district. Majority of the land area is notified as IT/ITES Sector specific Special Economic Zone (SEZ) by the Ministry of Commerce and Industry.
- Infopark campus has now 9.2 million sq.ft of Built-up area and park is the major contributor of export revenue from our State. Infopark offers Plug and Play and Bare shell office spaces for IT/ITES Companies to function and land parcels for long term lease for setting up IT Campuses. The park followed a Co-development model from the beginning for developing IT Buildings and associated infrastructure by partnering with Private investors/Infrastructure developers. Infopark is on a big scale expansion mode to add more built-up area in the campuses.
- The Planning of Second Phase of Infopark started in 2007- 2008 period after successfully implemented the Phase 1 through the participation of Private Investors. With the Government approval, Land acquisition activities started in 2008 and the basic land development activities commenced in 2010. Infopark planned the phase 2 campus as a Walk to Work IT township in 160 acres of land on the banks of Kadambra River with a picturesque landscape overlooking the Smart City Project. Infopark started leasing out land to Co-developers from 2011 and Cognizant came in as the First Co-developer to set up a captive campus. Basic infrastructure like roads, water supply and a 220 KV GIS substation etc. became ready by 2012. The full development of the campus is expected to be completed by 2030. Infopark Phase 2 will also be connected with the Water metro Project in the near future.

### 3. About Bureau of Energy Efficiency [BEE]

3.1. 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.
- ✓ Specify energy consumption standards for notified equipment and appliance.
- ✓ 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 1st, 2023 and the onsite verification process for Infopark was carried out during 3<sup>rd</sup> week of June, 2023.
- 4.2. Purpose, Scope and Objective of the project
  - 4.2.1. The baseline report contains in detail the Energy performance as units purchased and revenue realized with the detailed Technical and Distribution losses of the Designated Consumer during the year 2022-23. It contains the summary of the verification process and with supporting documents.
  - 4.2.2. 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.
  - 4.2.3. 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 base line year.

## **Minutes of the Annual Energy Audit conducted at Infopark**

The annual energy audit at Infopark Phase II & Cherthala campuses was commenced on 30<sup>th</sup> June 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 Infoparks Kerala, were involved in the successful completion of the annual energy audit.

1. **Mr. Vijayan V R, Assistant General Manager- Projects**
2. **Mr. Harilal H, Assistant Manager- Projects**
3. **Mr. Arun S, Assistant Engineer**

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 facility to understand the nature of operations carried out 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 Infoparks Kerala and one copy is maintained by the auditing agency.

**Shanavaz K.M.**

**Vijayan V R**

**Harilal H**

**Arun S**

**Richu Zachariah**

**Vishnu T. R.**

**Abhijith Narayanan**

**Jithin K Thomas**



## 5. Energy Scenario

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

Table 3: Category wise billed energy consumption

Sl. No:	Name of Circle		Consumer Category	Billed Energy (MU)		% Energy Consumption
				Input	Metered Energy	
1	INFOPARK Phase II Kakkanad	Phase II	Residential	9.40	0	0%
			Agricultural		0	0%
			Commercial/Industrial-LT		3.60	39%
			Commercial/Industrial-HT		5.35	59%
			Others- LT		0.19	2%
<b>Sub Total</b>				<b>9.40</b>	<b>9.14</b>	<b>100%</b>
2	INFOPARK Cherthala	Cherthala	Residential	0.88	0	0%
			Agricultural		0	0%
			Commercial/Industrial-LT		0.12	17%
			Commercial/Industrial-HT		0.54	79%
			Others		0.027	4%
<b>Sub Total</b>				<b>0.88</b>	<b>0.68</b>	<b>100%</b>
<b>Grand Total</b>				<b>10.28</b>	<b>9.83</b>	<b>100%</b>

### 5.2. Infrastructure Details

The Network system as on the FY 2022-23 consists of Length of 11 KV Line Length of LT KV Line, 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 4: Infrastructure details

Sl. No:	Parameters	FY Apr 2022 - Mar 2023
A.1	Input Energy purchased (MU)	10.28
A.2	Transmission loss (%)	4.38%
A.3	Transmission loss (MU)	0.45
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)	9
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

Sl. No:	Parameters	FY Apr 2022 - Mar 2023
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	0
A.13	No of feeders at 33kV voltage level	0
A.14	No of feeders at 11kV voltage level	9
A.15	No of LT feeders level	0
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	4
A.19	Line length (km) at LT level	1.2
A.20	HT/LT ratio	3.33

5.3. There are various step-down distribution transformers (11 kV/ 433 V) of different capacities are installed for LT power distribution. Transformers are stationed at strategic locations throughout the system to minimize power losses in the distribution system. The list of all transformers installed by Infopark/ consumers (Surrendered to Infopark) for the power transmission and distribution is as follows.

Table 5: Details of installed transformers

Transformer No.	Capacity		Voltage Ratio	Make	Location
<b>Infopark Phase II</b>					
Transformer1	25/31.5	MVA	220/33 kV	Telk	220kV Substation
Transformer2	25/31.5	MVA	220/33 kV	Telk	
Transformer1	12.5/16.5	MVA	33/11 kV	Telk	
Transformer2	12.5/16.5	MVA	33/11 kV	Telk	
Jyothirmaya 1	1600	KVA	11 kV/433 V	Voltamp	Jyothirmaya
Jyothirmaya 2	1600	KVA	11 kV/433 V	Voltamp	Jyothirmaya
Jyothirmaya 3	1600	KVA	11 kV/433 V	Voltamp	Jyothirmaya
Transasia 1	1600	KVA	11 kV/433 V	ResiTech	Transasia
Transasia 2	1000	KVA	11 kV/433 V	ResiTech	Transasia
Transasia 3	1000	KVA	11 kV/433 V	ResiTech	Transasia
Transasia 4	750	KVA	11 kV/433 V	ResiTech	Transasia
USS	500	KVA	11 kV/433 V	-	Near police gate
Claysis	315	KVA	11 kV/433 V	Unipower	Near Claysis Building
Station Transformer	200	KVA	11 kV/433 V	KEL	220kV Substation

Transformer No.	Capacity		Voltage Ratio	Make	Location
<b>Infopark Cherthala</b>					
Transformer 1	10/12.5	MVA	110/11 kV	Areva	110 kV Substation
Transformer 2	10/12.5	MVA	110/11 kV	Areva	
Chaithanya Transformer1	1250	kVA	11 kV/433 V	Voltamp	Chaithanya
Chaithanya Transformer2	1250	kVA	11 kV/433 V	Voltamp	Chaithanya
Station Transformer	200	kVA	11 kV/433 V	Intrans	Substation

5.4. The details of the electrical power distribution system of the Infopark phase II & Cherthala are given below:

Table 6: Existing Power Distribution Details of Infopark

Facility	Infopark Phase-II	Infopark Cherthala
Tariff	EHT-Licensee	EHT-Licensee
Supply voltage	220 kV	110 kV
Contract Demand	2250 kVA	550 kVA
Number of Transformers	31.5 MVA X 2 Nos., 16.5 MVA X 2 Nos., 1600 kVA X 4 Nos., 1000 kVA X 2 Nos., 750 kVA X 1 No., 500 kVA X 1 No., 315 kVA X 1 No., 200 kVA X 1 No.	10/12.5 MVA X 2 Nos. 1250 kVA x 2 Nos., 200 kVA X 1 Nos.

5.5. The Infopark 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 2250 kVA for Phase II campus and 550 kVA for Cherthala campus.

#### 5.6. Energy Conservation (Past & Future):

##### 5.6.1. Energy Conservation (Past & Future):

- **Installation of Solar Power Plant of Capacity 105 kWp:** The establishment of the 105 kWp solar power plant on the rooftop of Jyothirmaya building by the Parent company of Infopark marks a significant milestone for Infopark in its pursuit of sustainability and energy independence. The plant's clean and renewable energy generation will contribute to a greener future, reduce carbon emissions, and inspire the community to embrace renewable energy practices. Infopark remains

committed to exploring further opportunities in renewable energy and expanding its impact on the path towards a sustainable and resilient future.

- **Replacement of existing CFL streetlights with LED streetlights and Installation of new LED streetlights in Infopark Campuses.:** The street lighting load will be added to the system during the peak usage hours and continues through the off peak hours till dawn. By changing the conventional luminaries having high power consumption with low power consuming LED luminaries with same or better luminous efficacy, the street lighting power demand during the peak hours could be reduced and energy consumption could be achieved. Infopark has taken steps to convert the existing conventional luminaries in the common area with low power consuming LED luminaries for better demand side management.
- **Upgrading Energy Meters to class 0.2s:** It is recommended to upgrade the existing Energy Meters to ones with Class 0.2s accuracy. The use of accurate Energy Meters ensures precise energy measurement for billing and monitoring purposes. A plan is in place to replace the current Energy Meters with the recommended Class 0.2s to improve the accuracy of energy measurement and enhance overall efficiency.

## 5.7. Energy Scenario & Energy Performance Index:

5.7.1. The energy scenario and performance indices for the financial year's 2022-23 is mentioned in the executive summary section under Table-4.

## 6. Energy Distribution System

6.1. Infopark has consumer’s category in majorly 3 types of categories out of the 5 as specified in Sector Specific Pro-forma of Form-1. The categorization as per BEE are:

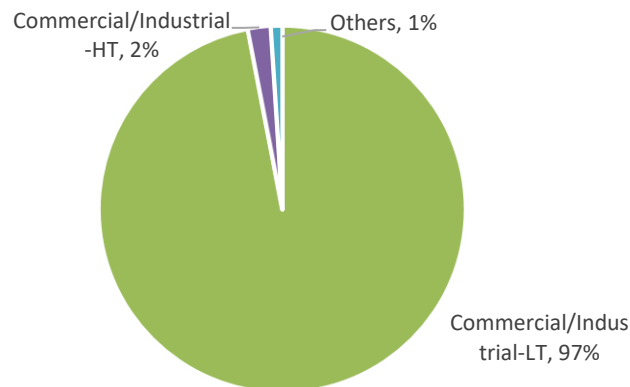
- Residential
- Agricultural
- Commercial/Industrial LT
- Commercial/Industrial HT
- Others

6.2. The details of consumer categories in Infopark is as tabulated in the table below.

Table 7: Details of consumer category for FY 2022-23

Type of Consumer Category	No. of Consumer	%
Residential	0	0%
Agricultural	0	0%
Commercial/Industrial-LT	181	96.8%
Commercial/Industrial-HT	4	2.1%
Others	2	1.1%
<b>Total</b>	<b>187</b>	<b>100%</b>

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



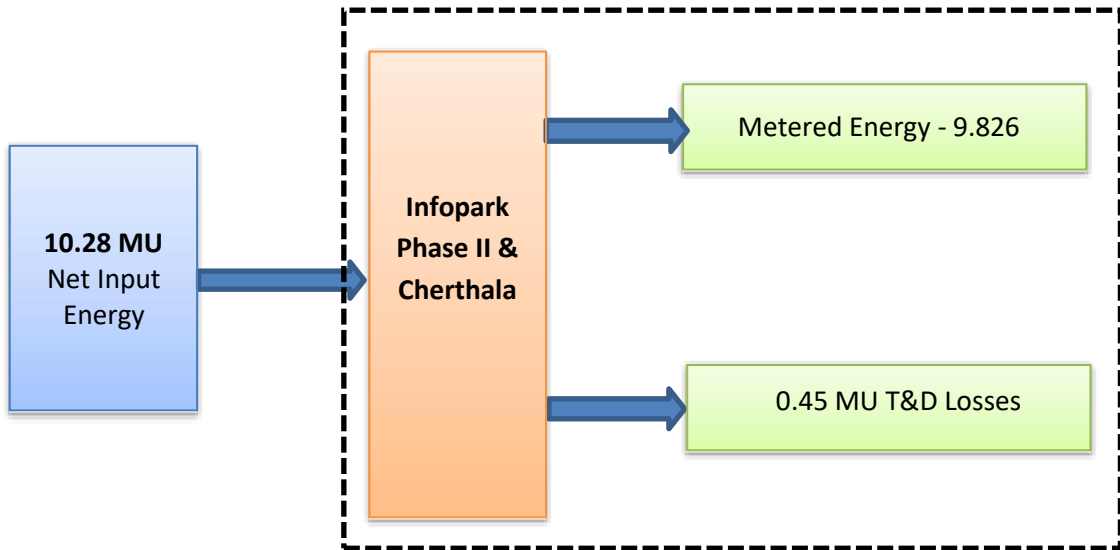
6.3. Grid Map of Infopark, Single Line Diagram (SLD) and Energy Flow Diagram.

6.3.1. The detailed SLD of Infopark campuses are attached in Annexure 1.

6.4. Gate to Gate Boundary Energy Diagram

6.4.1. Both Phase II and Cherthala campuses of Infopark receive power supply from KSEBL (Kerala State Electricity Board Limited). The bulk supply tariff of Infopark for the FY 2022-23 is Rs. 5.9/unit for energy charges and Rs.380/kVA for demand charges. Infopark Phase-II campus is having an agreement with KSEBL for a

contract demand of 2250 kVA and Infopark Cherthala campuses is having a agreement for purchase of power from KSEBL for a contract demand of 550 kVA. The Gate-to-Gate Boundary Diagram for FY 2022-23 is as shown in figures below.



## 6.5. Grid Strengthening Measures and Modern Technologies

- 6.5.1. Infopark is actively planning to introduce smart/prepaid energy meters for all its consumers in the upcoming years as part of its commitment to innovation and customer-centric energy management solutions. The primary objective of implementing smart/prepaid energy meters is to enhance the consumer experience by providing real-time energy usage information, transparent billing, and greater control over energy expenses.
- 6.5.2. Infopark 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, Infopark aims to maximize energy efficiency and minimize waste.

## 6.6. Power Purchase Details

- 6.6.1. The Infopark 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 2250 kVA and 550 kVA for Phase II and Cherthala campuses respectively. The details of power sales & purchase for Infopark Phase II & Cherthala campuses in FY 2022-23 is shown below.

Table 8: Power sales details 2022-23

Sl. No:	Infopark Campus	Tariff Category	No: of Consumers	Connected Load (MW)	Units Sold (MU)
1	Phase II	HT 1(B)	3	2.55	5.354
2	Cherthala	HT 1(B)	1	0.30	0.538
3	Phase II	LT IV(B)	137	3.84	2.682
4		LT VI(F)	17	0.48	0.739
5		LT VII(A)	1	0.18	0.040
6		LT VI(C)	1	0.01	0.007
7		LT VIII(B)	1	0.02	0.118
8		LT VI (B)	1	0.01	0.013
9		Cherthala	LT IV B	21	0.18
10	LT VI C		1	0.01	0.003
11	LT VI F		1	0.00	0.004
12	LT VIII(B)		1	0.01	0.014
13	LT VII(A)		1	0.00	0.001

#### 6.7. Circle Wise Loss Details

As of the financial year 2022-23 data, the Phase II Campus in Infopark has 161 number consumers (including auxillary) with a cumulative connected load of 7.17 MW and 83.26 MU Billed energy which is also 100 %metered from consumer end. The industrial LT category accounts for 158 no of consumers (1 auxillary connection included) with a connected load of 4.57 MW and billed energy of 35.35 MU. The industrial HT category accounts for 3 no. of consumers with a cumulative connected load of 2.55 MW and billed energy of 47.92 MU.

And in case of Infopark Cherthala campus, there are total 26 consumers (including one auxillary connection) is present. The total connected load is about 0.526 MW and billed energy is 0.68 MU. The industrial LT category accounts for 25 no of consumers (1 auxillary connection included) with a connected load of 0.23 MW and billed energy of 0.14 MU. The industrial HT category accounts for a single consumer with a connected load of 0.3 MW and billed energy of 0.54 MU.

The overall T&D Loss of Infopark Phase II & Cherthala as an entity is 0.45 MU, and 4.38% in FY 2022-23. The data for the same is as shown in the table below:

Table 9: Circle Wise Loss Details

Sl. No	Name of Circle	Consumer Category	No of Connection (Metered)	% Share	T & D Loss	
					MU	%
1	INFOPARK Phase II Kakkanad	Residential	0	0%	0.25	2.69%
		Agricultural	0	0%		
		Commercial/Industrial-LT	157	97.5%		
		Commercial/Industrial-HT	3	1.9%		
		Others- LT	1	0.6%		
Sub-total			161	100%	0.25	2.69%
2	INFOPARK Cherthala	Residential	0	0%	0.20	22.42%
		Agricultural	0	0%		
		Commercial/Industrial-LT	24	92.3%		
		Commercial/Industrial-HT	1	3.8%		
		Others - LT	1	3.8%		
Sub-total			26	100%	0.20	22.42%
3	Total	Residential	0	0%	0.45	4.38%
		Agricultural	0	0%		
		Commercial/Industrial-LT	181	96.8%		
		Commercial/Industrial-HT	4	2.1%		
		Others	2	1.1%		
Total			187	100%	0.45	4.38%

Methodology for T&D loss computation:

- *T&D Losses (MU) of a circle = Sum of Input Energy of the circle (MU) – Sum of Metered energy of all categories within the circle (MU)*
- *T&D Losses in %=*

$$[T\&DLosses(MU) / Input\ Energy\ to\ the\ circle\ (MU)] \times 100$$

#### 6.8. Category of Service

It can be observed that the maximum numbers of consumers are from the LT IV (B) tariff category. As of Financial year, 2022-23, Infopark has a total number of 187 consumers in three number of consumer category, which is 181 no. of Commercial/Industrial-LT consumer, 4 no of Commercial/Industrial-HT consumer and 2 nos. of other consumer category. The details for the consumer service for FY 2022-23 is as per the table below:



Table 10: Details for the consumer service for FY 2022-23

Name of circle	Circle code	Consumer category	No: of Connections			% of number of connections	Connected Load (MW)			% of connected load
			Metered	Un-Metered	Total		Metered	Un-Metered	Total	
INFOPARK Phase II	Phase II	Residential	0	0	0	0%	0	0	0	0%
		Agricultural	0	0	0	0%	0	0	0	0%
		Commercial/Industrial-LT	157	0	157	97.5%	4.57	0	3.65	58%
		Commercial/Industrial-HT	3	0	3	1.9%	2.55	0	2.55	41%
		Others- LT	1	0	1	0.6%	0.06	0	0.06	1%
Sub-total			161	0	161	100%	7.18	0	6.2619	100%
INFOPARK Cherthala	Cherthala	Residential	0	0	0	0.0%	0	0	0	0%
		Agricultural	0	0	0	0.0%	0	0	0	0%
		Commercial/Industrial-LT	24	0	24	92.3%	0.226	0	0.226	42%
		Commercial/Industrial-HT	1	0	1	3.8%	0.3	0	0.3	56%
		Others - LT	1	0	1	3.8%	0.01	0	0.01	2%
Sub-total			26	0	26	100%	0.54	0	0.54	100%
Total	Residential	0	0	0	0.0%	0	0	0	0%	
	Agricultural	0	0	0	0.0%	0	0	0	0%	
	Commercial/Industrial-LT	181	0	181	96.9%	4.79	0	3.88	57%	
	Commercial/Industrial-HT	4	0	4	2.1%	2.85	0	2.85	42%	
	Others	2	0	2	1.0%	0.07	0	0.07	1%	
At company level			187	0	187	100%	7.71	0	6.80	100%

## 6.9. Various Losses in Last Three Years

### ***AT&C Losses at Infopark***

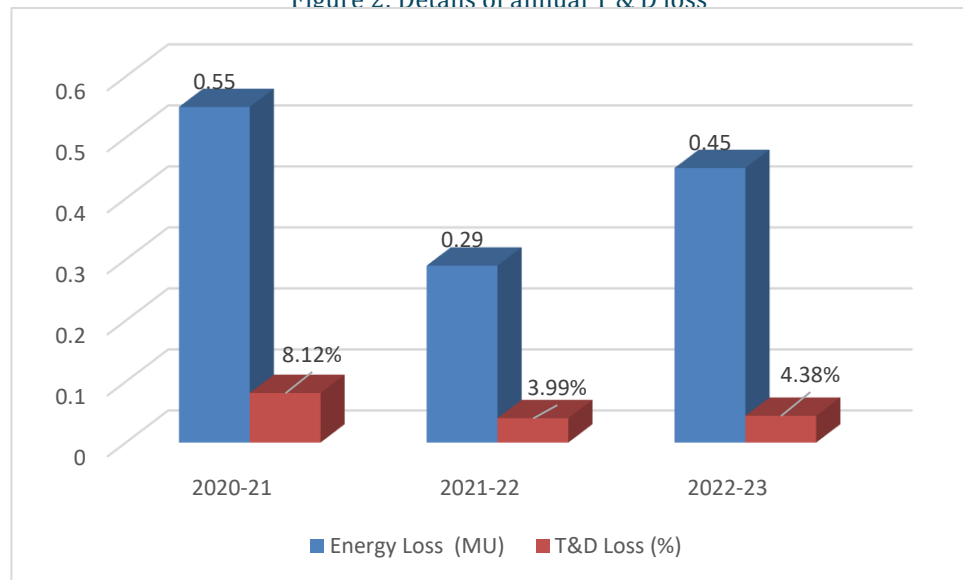
The aggregate losses of the system are subdivided into technical and commercial losses. The technical losses consist of the losses in the transmission and distribution network, losses in transformer and other electrical equipment whereas commercial losses include losses due to incorrect metering, billing errors, tampering of meters, sluggish meters etc. Infopark has total 17 transformers including power transformers and distribution transformers in Phase II and Cherthala campuses. 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 11: Yearly T&D Loss details

2020-21				2021-22				2022-23			
Input Energy (MU)	Metered Energy (MU)	Total Energy Loss (MU)	T & D Loss (%)	Input Energy (MU)	Metered Energy (MU)	Total Energy Loss (MU)	T & D Loss (%)	Input Energy (MU)	Metered Energy (MU)	Total Energy Loss (MU)	T & D Loss (%)
6.77	6.22	0.55	8.12%	7.19	6.91	0.29	3.99%	10.28	9.83	0.45	4.38%

Figure 2: Details of annual T & D loss



#### 6.10. 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 12 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 12: Observations in the Randomly Checked Energy Meters

Sl. No	Circle	Consumer Name	Consumer Category
1	Phase II	Jyothirmaya	HT
2	Phase II	Merp Solutions	LT
3	Phase II	Cafeteria - Transasia	LT
4	Phase II	Lanware - Transasia	LT
5	Phase II	Suniya Utility Panel	LT
6	Phase II	VVDN (VisionBU)	LT
7	Phase II	Claysys Ground	LT
8	Phase II	13B1- Transasia	LT
9	Phase II	IDATA - Jyothirmaya	LT
10	Cherthala	Chaithanya (11 kV Feeder)	HT
11	Cherthala	Chiller 2	LT
12	Cherthala	Techgentisa	LT

### Circle-wise Losses at Infopark

The details of circle wise losses in Infopark campuses are tabulated below.

Table 13: Details of circle wise losses

Sl. No:	Name of Circle	T&D Loss					
		FY 2020-21		FY 2021-22		FY 2022-23	
		MU	%	MU	%	MU	%
1	Infopark Phase II	0.42	6.95%	0.15	2.23%	0.25	2.69%
2	Infopark Cherthala	0.13	17.85%	0.14	21.99%	0.20	22.42%

### Summary of AT&C loss at Infopark

Table 14: Summary of AT&C Loss

Financial Year	Input Energy (MU)	Billing Efficiency (%)	Collection Efficiency (%)	AT&C Loss (%)
2020-21	6.77	91.88%	100%	8.12%
2021-22	7.19	96.01%	100%	3.99%
2022-23	10.28	95.17%	100%	4.38%

#### 6.11. Losses in Distribution Network

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

- 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]*

- 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.

#### 6.11.2. 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)
- L.T Line losses
- Miscellaneous technical losses
- Losses due to loose jump connections in the line
- Losses due to short circuits & earth faults
- Losses in service mains of installations.
- Losses incurred in CT'S & current coils of energy meters.

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

*Commercial Loss = Distribution Loss (-) Technical Loss*

#### 6.11.4. The major factors that affecting commercial loss are as follows,

- 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.

## 6.12. T&D Loss Calculation

6.12.1. Overall T&D Loss of DISCOM =  $1 - (\text{Total Energy sale to consumer including EHT, HT and LT in MU} / \text{Total Energy input in MU})$

6.12.2. 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.

## 6.13. Computation of AT&C Loss

6.13.1. 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 (%) =  $\text{Total Sale in MU} / \text{Total input in MU}$
- Overall Collection Efficiency (%) =  $\text{Total Collection Received (Rs. in Crs.)} / \text{Total Billing to Consumers (Rs. in Crs.)}$
- AT&C Loss (%) =  $1 - \{\text{Collection Efficiency (\%)} \times \text{Billing Efficiency (\%)}\}$

## 6.14. Measuring Equipment and Instrument Calibration

6.14.1. The quantity of electrical power and energy supplied is by KSEBL (Kerala state electricity Board Limited), at the interconnection 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.

- 6.14.2. 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 Infopark.

## 7. List of Documents Verified

7.1. The list of documents verified for Annual Energy Audit are tabulated below.

Table 15: List of documents

Sl. No	Particular	Document Verified
<b>A</b>	<b>Summary of Energy Input and Infrastructure</b>	
A.1	Purchased energy Details	Power sales and purchase report
A.2	Technical 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 66/33kV voltage level	ARR
A.9	Verification of 100% metering at 11kV voltage level	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>B</b>	<b>Meter reading of input energy injection points</b>	
B.1	Energy input details meter wise, with other mentioned details	Tariff order, tariff petition, ARR
B.2 to B.1000	Energy input details meter wise, with other mentioned details of all input energy injections points	Tariff order, tariff petition, ARR
<b>C</b>	<b>Summary of Circle wise losses</b>	
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

Sl. No	Particular	Document Verified
C.3	Connected load of metered consumers category wise of each	Tariff order, tariff petition, ARR
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



## 8. Details of Analysis

- 8.1. During the period of 2023-23, the total input energy of Infopark Phase II and Cherthala campuses is about 10.28 MU and total energy sale is about 9.83 MU. Hence the T&D loss is 0.45 MU i.e., 4.38%.
- 8.2. The major network system includes 11 KV Line (4 ckt km.), LT KV Line (1.2 ckt km.), 6 No. of 11 KV Group & Feeder voltage level and 100 % metering available at both DT and consumer end.
- 8.3. As of the financial year 2022-23, the Phase II Campus has 161 number consumers with a cumulative connected load of 7.18 MW and 9.14 MU billed energy which is also 100 % metered from consumer end. The industrial LT category accounts for 157 no of consumers with a connected load of 4.57 MW and billed energy of 3.60 MU. The industrial HT category accounts for 3 no. of consumers with a cumulative connected load of 2.55 MW and billed energy of 5.35 MU. The others/auxillary category accounts for a single connection with connected load of 0.06MW and billed energy of 0.19 MU.
- 8.4. The Cherthala Campus has 26 number consumers with a cumulative connected load of 0.54 MW and 0.68 MU billed energy which is also 100 % metered from consumer end. The industrial LT category accounts for 24 no of consumers with a connected load of 0.226 MW and billed energy of 0.12 MU. The industrial HT category accounts for a single consumer with a connected load of 0.3 MW and billed energy of 0.54 MU. The others/auxillary category accounts for a single connection with a connected load of 0.01MW and billed energy of 0.03MU.
- 8.5. The campus wise T & D loss details of Infopark campuses are given in the table below.

Table 16: Campus wise T &D loss

Infopark Campus	T&D Loss	
	MU	%
Phase II	0.25	2.69%
Cherthala	0.20	22.42%
<b>Total</b>	<b>0.45</b>	<b>4.38%</b>

## 8.6. Revenue Collection & 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 17: Details of collection efficiency

<b>Sl. No.</b>	<b>Category</b>	<b>Collection %</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	HT - 1(B)	100
	<b>HT Total</b>	<b>100</b>
1	LT IV(B)	100
2	LT VI(F)	100
3	LT VII(A)	100
4	LT VI(C)	100
5	LT VIII(B)	100
6	LT VI (B)	100
7	LT IV B	100
8	LT VI C	100
9	LT VI F	100
	<b>LT Total</b>	<b>100</b>
	<b>Grand Total</b>	<b>100</b>

## 9. Sectoral Study (Covering Objectives as per Technical Scope)

- 9.1. Infopark summary details as per 2022-23 is total Input energy is 10.28 MU and total energy billed or LT/HT sale is 9.83 MU and T&D losses is 4.38%.
- 9.2. Infopark has 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 there medial action initiated to reduce loss levels has been sent to the Kerala state Electricity regulatory commission.

### 9.3. Various Initiatives & Energy Efficiency Schemes

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

- Replacement of existing CFL lights with LED lights and Installation of new LED street lights in Infopark campus.

CFL/Metal halide/Mercury vapor type streetlight contribute a major share in the Infopark lighting system. The street lighting load will be added to the system during the peak usage hours and continues through the off-peak hours till dawn. By changing the conventional luminaires having high power consumption with low power consuming LED luminaires with same or better luminous efficacy, the street lighting power demand during the peak hours could be reduced and energy consumption could be achieved. Infopark has taken steps to convert the existing conventional luminaries with low power consuming LED luminaries for better demand side management.

- Conducting awareness programs for minimizing the energy wastage.

Awareness program are conducted in for educating the consumers in order to minimize energy wastage in the customer's premises. Leaflets were distributed explaining various measures like usage of star rated equipment, proper energy usage practices etc. These activities have aided in alerting the consumers about the energy wastage occurring in their office premises and providing solutions to avoid energy wastage.

9.4. **Average Billing Rate (ABR)**

9.5. 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:

$$ABR \text{ of a category of consumer} = \frac{\text{Total expected revenue from the category}}{\text{Total sale of power to the category}}$$

Table 18: Average billing rate FY 2020-2023

Category	Average Billing Rate (Rs.) for FY		
	2020-21	2021-22	2022-23
LT	7.27	9.52	9.78
HT	10.24	8.79	8.98

## 10. Conclusion

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

- As of FY 2022-23, Infopark has a total number of 187 consumer in three number of consumer category, which is 181 no of Commercial/Industrial-LT consumer, 4 nos of Commercial/Industrial-HT consumer and 2 no. of other/ auxillary consumer category
- The input energy for the FY 2022-23 is 10.28 Million KWh.
- The Net input energy at DISCOM Periphery after adjusting the transmission losses and energy traded is also the same as input energy purchased for the FY 2022-23 is 9.83 Million KWh.
- The Transmission and Distribution (T&D) losses are 0.45 Million KWh for FY 2022-23.

10.2. 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**

Single Line Diagram

220kV CT PARAMETERS						
BAY NO.	DEVICE	APPLICATION	CORE No.	RATIO	OUTPUT VA	ACCURACY CLASS
=D03	-T1	O/C PROTECTION	1	400-300/1A	-	PX
		DIFF. PROTECTION	2	400-300/1A	-	PX
		METERING	4	200-100/1A	10-2.5	0.2
		BUSBAR PROTECTION	5	400-300/1A	-	PX
		REF. PROTECTION	1	150/1A	10	0.2S
=D01,D02	-T1	TRANSFORMER DIFF. PROT.	1	200-100/1A	-	PX
		O/C/EF PROTECTION	2	200-100/1A	10-5	SP10
		METERING	4	200-100/1A	10-2.5	0.2
		BUSBAR PROTECTION	5	400-300/1A	-	PX
		REF. PROTECTION	1	200-100/1A	-	PX
=D01,D02	-T4 (Neutral CT)	REF. PROTECTION	1	200-100/1A	-	PX

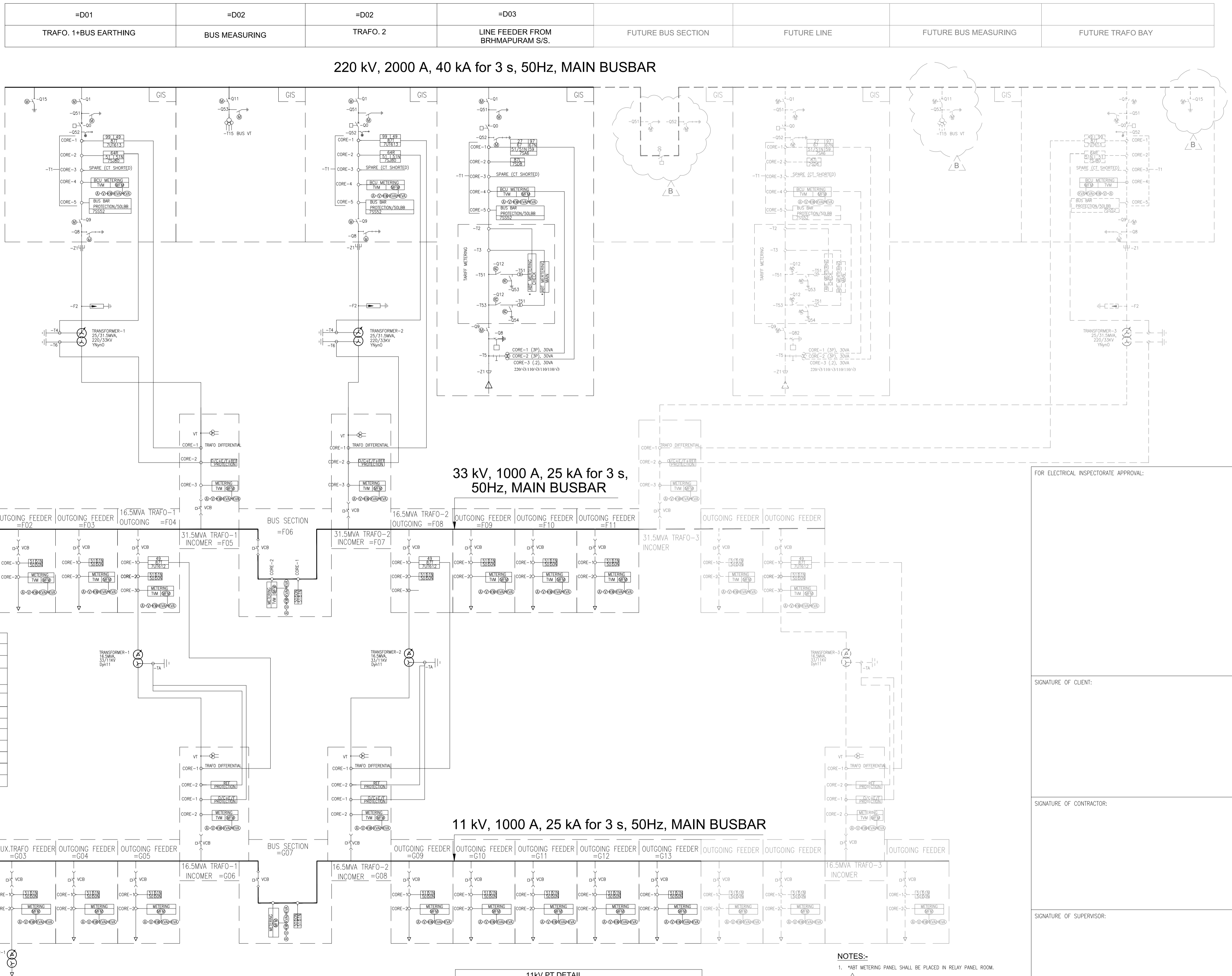
220kV PT DETAIL						
BAY NO.	DEVICE	APPLICATION	CORE No.	PRIMARY KV	SECONDARY V	OUTPUT VA
=D02,D03	-T15,T5	PROTECTION	1	220/SQRT 3	110/SQRT 3	30
		PROTECTION (OPEN DELTA)	2	220/SQRT 3	110	30
		METERING	3	220/SQRT 3	110/SQRT 3	30
=D03	-T51,T52	METERING	1	220/SQRT 3	110/SQRT 3	30

220KV SYSTEM PARAMETERS		
1. RATED VOLTAGE		245kV
2. RATED FREQUENCY		50HZ
3. RATED LIGHTING IMPULSE WITHSTAND VOLTAGE (kVp)		±1050
4. RATED SHORT DURATION POWER FREQUENCY WITHSTAND VOLTAGE (kVrms)		460
5. RATED NORMAL CURRENT-BUSBAR		2000A
6. RATED NORMAL CURRENT-FEEDER		1600A
7. RATED SHORT TIME WITH STAND CURRENT		40KA
8. RATED DURATION OF SHORT CIRCUIT		3S
9. AMBIENT INDOOR TEMPERATURE		+10 TO +45 C

33KV SYSTEM PARAMETERS		
1. RATED VOLTAGE		36kV
2. RATED FREQUENCY		50HZ
3. RATED LIGHTING IMPULSE WITHSTAND VOLTAGE (kVp)		±170
4. RATED SHORT DURATION POWER FREQUENCY WITHSTAND VOLTAGE (kVrms)		70
5. RATED NORMAL CURRENT-BUSBAR		1000A
6. RATED SHORT TIME WITH STAND CURRENT		25KA
7. RATED DURATION OF SHORT CIRCUIT		3S
8. AMBIENT INDOOR TEMPERATURE		upto +45 C

33kV CT DETAIL (INCOMER & BUS SECTION)						
BAY NO.	DESC	APPLICATION	CORE No.	RATIO	OUTPUT VA	ACCURACY CLASS
=F05,F07	TRAFO INCOMERS	DIFF. PROTECTION	1	600-300/1A	-	PS
		O/C, E/F, REF. PROTECTION	2	600-300/1A	15-10	SP20
		METERING	3	600-300/5A	35-20	0.5
=F05,F07	NEUTRAL CT	REF. PROTECTION	1	600-300/1A	15-10	SP20
=F06	BUS COUPLER	PROTECTION	1	600-300/5A	25-20	SP20
		METERING	2	600-300/5A	35-20	0.5
=F04,F08	OUTGOING TRAFO FEEDERS	DIFF. PROTECTION	1	600-300/1A	-	PS
		PROTECTION	2	600-300/5A	25-20	SP20
		METERING	3	600-300/5A	35-20	0.5
=F01,F02,F03 =F09,F10,F11	OUTGOING LINE FEEDERS	PROTECTION	1	300-150/5A	25-20	SP20
		METERING	2	300-150/5A	35-20	0.5

33kV PT DETAIL						
BAY NO.	DEVICE	APPLICATION	CORE No.	PRIMARY kv	SECONDARY V	OUTPUT VA
=F05,F07	VT	PROTECTION	1	33/SQRT 3	110/SQRT 3	50
		METERING	2	33/SQRT 3	110/SQRT 3	50



SYMBOL	DESIGNATION	DESCRIPTION	SYMBOL	DESIGNATION	DESCRIPTION
	-00	CIRCUIT BREAKER (2000A,40kA-35sec.)		-T1, -T2, -T3, T4	CURRENT TRANSFORMER
	-01,-09, -011,-012,	DISCONNECTOR SWITCH 3 POLE, MOTOR OPERATED. (1600A,40kA-35sec.)		-T15, T51, T52	VOLTAGE TRANSFORMER
	-052,-08	GROUNDING SWITCH 3 POLE, MOTOR OPERATED, ISOLATED. (40kA-35sec.)		-T5	VOLTAGE TRANSFORMER WITH MANUAL ISOLATING LINK
	-015,-051,-053,-054	GROUNDING SWITCH 3 POLE, MOTOR OPERATED. (40kA-35sec.)		VCB	33kV & 11kV VACUUM CIRCUIT BREAKER
	-08	HIGH SPEED GROUNDING SWITCH 3 POLE, MOTOR OPERATED (40kA-35sec.)		-Z1	CABLE TERMINATION
	-Z1	SF6/AR BUSHING		MFM	MULTI FUNCTION DIGITAL METER
	TVM	TRI-VECTOR METER			

PROTECTION ANSI CODE :-

87L	LINE DIFFERENTIAL PROTECTION
87T	TRANSFORMER DIFFERENTIAL PROTECTION
67N	DIR. OVER CURRENT PROTECTION
67N	DIR. EARTH FAULT PROTECTION
59	OVER VOLTAGE PROTECTION
97	VT FUSE FAILURE PROTECTION
50LBB	BREAKER FAILURE PROTECTION
99	OVER FLUING PROTECTION
64R	RESTRICTED EARTH FAULT PROTECTION
49	THERMAL OVERLOAD PROTECTION
27	UNDER VOLTAGE PROTECTION
51	IDMT OVER CURRENT PROTECTION
51N	IDMT EARTH FAULT PROTECTION
50	INSTANTANEOUS OVER CURRENT PROTECTION
50N	INSTANTANEOUS EARTH FAULT PROTECTION

11KV SYSTEM PARAMETERS

1. RATED VOLTAGE	12kV
2. RATED FREQUENCY	50HZ
3. RATED LIGHTING IMPULSE WITHSTAND VOLTAGE (kVp)	±75
4. RATED SHORT DURATION POWER FREQUENCY WITHSTAND VOLTAGE (kVrms)	28
5. RATED NORMAL CURRENT-BUSBAR	1000A
6. RATED SHORT TIME WITH STAND CURRENT	25KA
7. RATED DURATION OF SHORT CIRCUIT	3S
8. AMBIENT INDOOR TEMPERATURE	+10 TO +45 C

11kV PT DETAIL						
BAY NO.	DEVICE	APPLICATION	CORE No.	PRIMARY kv	SECONDARY V	OUTPUT VA
=D06,D08	TRAFO INCOMERS	PROTECTION	1	11/SQRT 3	110/SQRT 3	50
		METERING	2	11/SQRT 3	110/SQRT 3	50

11kV CT DETAIL (INCOMER & BUS SECTION)						
BAY NO.	DEVICE	APPLICATION	CORE No.	RATIO	OUTPUT VA	ACCURACY CLASS
=D06,D08	TRAFO INCOMERS	REF. PROT.	1	1000-500/1A	-	PS
		DIFF. PROT.	2	1000-500/1A	-	PS
		O/C, E/F PROTECTION	1	1000-500/5A	20-10	SP20
=D06,D08	NEUTRAL CT -T4	REF. PROTECTION	1	1000-500/1A	15-10	0.5
		METERING	2	1000-500/5A	15-10	0.5
=D07	BUS COUPLER	PROTECTION	1	1000-500/5A	20-10	SP20
		METERING	2	1000-500/5A	15-10	0.5
=D01,D02,D03 =D04,D05,D09 =D10,D11,D12 =D13	OUTGOING FEEDERS	PROTECTION	1	400-200/5A	10-5	SP20
		METERING	2	400-200/5A	15-10	0.5

NOTES:-  
1. \*AST METERING PANEL SHALL BE PLACED IN RELAY PANEL ROOM.  
B REVISION MARK

FOR ELECTRICAL INSPECTORATE APPROVAL:

SIGNATURE OF CLIENT:

SIGNATURE OF CONTRACTOR:

SIGNATURE OF SUPERVISOR:

OWNER : M/S INFOPARK KOCHI  
CONSULTANT : M/S FEEDBACK INFRASTRUCTURE SERVICES PRIVATE LTD.  
CONTRACTOR : SIEMENS LTD., INDIA

PROJECT : 220/33/11KV S/S AT INFOPARK KOCHI

TITLE : SINGLE LINE DIAGRAM FOR 220/33/11KV SYSTEM

DWG. NO. : (1)-G71770-AD206-S151-B

Rev.	Remarks	Date	Name
B	REVISED AS PER CEI COMMENTS	11.01.2014	KS
A	REVISED AS DISCUSSED ON 24.07.2013	26.07.2013	SR

General Information				
1	Name of the DISCOM	INFOPARKS KERALA POWER LICENSEE		
2	i) Year of Establishment	2013		
	ii) Government/Public/Private	Private		
3	DISCOM's Contact details & Address			
i	City/Town/Village	Project Office, Park Centre, Near Thapasya Building		
ii	District	Ernakulam		
iii	State	Kerala	Pin	682042
iv	Telephone		Fax	
4	Registered Office			
i	Company's Chief Executive Name	Susanth Kurunthil		
ii	Designation	CEO		
iii	Address	Project Office, Park Centre, Near Thapasya Building		
iv	City/Town/Village		P.O.	
v	District	Ernakulam		
vi	State	Kerala	Pin	682042
vii	Telephone	0484-2415217/18	Fax	
5	Nodal Officer Details*			
i	Nodal Officer Name (Designated at DISCOM's)	Vijayan.V.R.		
ii	Designation	AGM - PROJECTS		
iii	Address	Project Office, Park Centre, Near Thapasya Building		
iv	City/Town/Village		P.O.	
v	District	Ernakulam		
vi	State	Kerala	Pin	682042
vii	Telephone	0484-2415217/18	Fax	
6	Energy Manager Details*			
i	Name	Ajin Paul		
ii	Designation	Energy Auditor	Whether EA or EM	EA
iii	EA/EM Registration No.	EA-29723		
iv	Telephone	48402655548	Fax	
v	Mobile	8089217164	E-mail ID	<a href="mailto:ajinpaulonline@gmail.com">ajinpaulonline@gmail.com</a>
7	Period of Information			
	Periof of information including Date and Month (Start & End)	April 2022 - March 2023		



<b>Performance Summary of Electricity Distribution Companies</b>			
<b>1</b>	Period of Information Year of (FY) information including Date and Month (Start & End)	April 2022 - March 2023	
<b>2</b>	<b>Technical Details</b>		
<b>(a)</b>	<b>Energy Input Details</b>		
(i)	Input Energy Purchase (From Generation Source)	Million kwh	10.28
(ii)	Net input energy (at DISCOM Periphery after adjusting the transmission losses and energy traded)	Million kwh	10.28
(iii)	Total Energy billed (is the Net energy billed, adjusted for energy traded))	Million kwh	9.83
<b>(b)</b>	Transmission and Distribution (T&D) loss Details	Million kwh	0.45
		%	0.04
	Collection Efficiency	%	100%
<b>(c)</b>	Aggregate Technical & Commercial Loss	%	4.38%

**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: Vijayan.V.R.  
Name of the DISCOM: INFOPARKS KERALA POWER LICENSEE  
Full Address:- Project Office, Park Centre, Near Thapasya Building**

**Signature:-  
Name of Energy Manager\*: AJIN PAUL  
Registration Number: EA-29723**

**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	2	2		
iii	Number of sub-divisions	0	0		
iv	Number of feeders	10	10		
v	Number of DTs	11	11		
vi	Number of consumers	187	187		2 station tfrs incld
<b>2</b>	<b>Parameters</b>	<b>66kV and above</b>	<b>33kV</b>	<b>11/22kV</b>	<b>LT</b>
a. i.	Number of conventional metered consumers	0	0	4	0
ii	Number of consumers with 'smart' meters	0	0	0	0
iii	Number of consumers with 'smart prepaid' meters	0	0	0	0
iv	Number of consumers with 'AMR' meters	0	0	0	181
v	Number of consumers with 'non-smart prepaid' meters	0	0	0	0
vi	Number of unmetered consumers	0	0	0	0
vii	<b>Number of total consumers</b>	0	0	4	181
b.i.	Number of conventionally metered Distribution Transformers	0	0	0	1
ii	Number of DTs with communicable meters	0	0	0	10
iii	Number of unmetered DTs	0	0	0	0
iv	<b>Number of total Transformers</b>	0	0	0	11
c.i.	Number of metered feeders	0	0		0
ii	Number of feeders with communicable meters	0	0	10	0
iii	Number of unmetered feeders	0	0	0	0
iv	<b>Number of total feeders</b>	0	0	10	0
d.	Line length (ct km)		5.2		
e.	Length of Aerial Bunched Cables		0		
f.	Length of Underground Cables		0		
<b>3</b>	<b>Voltage level</b>	<b>Particulars</b>	<b>MU</b>	<b>Reference</b>	<b>Remarks (Source of data)</b>
i	66kV and above	Long-Term Conventional	0.00	Includes input energy for franchisees	Infopark has no 66 kV voltage level supply
		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	0.00%		
		Quantum of inter-state transmission loss	0	As confirmed by SLDC, RLDC etc	
		<b>Power procured from inter-state sources</b>	0.00	Based on data from Form 5	
		<b>Power at state transmission boundary</b>	0.00		
ii	33kV	Long-Term Conventional	0		Infopark has no 33 kV voltage level supply
		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	0.00%		
		Quantum of intra-state transmission loss	0		
		<b>Power procured from intra-state sources</b>	0		
iii		<b>Input in DISCOM wires network</b>	0		
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	10.20		Phase II-9.32, Cherthala-0.87
vi	LT	Renewable Energy Procurement	0.08		Export from solar plant of MLSB (0.069MU) & Tranasia (0.0078 MU)
		Sales Migration Input	0		
vii		<b>Energy Embedded within DISCOM wires network</b>	10.28		
viii		<b>Total Energy Available/ Input</b>	10.28		
<b>4</b>	<b>Voltage level</b>	<b>Energy Sales Particulars</b>	<b>MU</b>	<b>Reference</b>	
i	LT Level	DISCOM' consumers	3.93	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	3.93		
		Quantum of LT level losses	0.15		
		Energy Input at LT level	4.08		
ii	11 kV Level	DISCOM' consumers	5.89	Include sales to consumers in franchisee areas, unmetered consumers	Phase II - 5353738 kWh Cherthala- 537865.9 kWh
		Demand from open access, captive		Non DISCOM's sales	
		Embedded generation at 11 kV level used		Demand from embedded generation at 11kV level	

		<b>Sales at 11 kV level</b>	5.89		
		Quantum of Losses at 11 kV	0.30		
		Energy input at 11 kV level	6.19		
iii	33 kV Level	DISCOM' consumers	0	Include sales to consumers in franchisee areas, unmetered consumers	
		Demand from open access, captive		Non DISCOM's sales	
		Embedded generation at 33 kV or below level		This is DISCOM and OA demand met via energy generated at same voltage level	
		<b>Sales at 33 kV level</b>	0		
		Quantum of Losses at 33 kV	0		
		Energy input at 33kV Level			
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		
		<b>Sales at 66kV and above (EHV)</b>	0		
<b>Total Energy Requirement</b>			<b>10.28</b>		
<b>Total Energy Sales</b>			<b>9.826</b>		

**Energy Accounting Summary**

5	DISCOM	Input (in MU)	Sale (in MU)	Loss (in MU)	Loss %
i	LT	4.08	3.93	0.15	3.58%
ii	11 Kv	6.19	5.89	0.30	4.90%
iii	33 kv				
iv	> 33 kv				
6	Open Access, Captive	Input (in MU)	Sale (in MU)	Loss (in MU)	
i	LT				
ii	11 Kv				
iii	33 kv				
iv	> 33 kv				

Loss Estimation for DISCOM	
T&D loss	0.450
D loss	0.450
T&D loss (%)	4.38%
D loss (%)	4.38%

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

Division Wise Losses																							
Period From April 2022 to 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	Billed energy (MU)				T&D loss (MU)	T&D loss (%)	Billed Amount in Rs. Crore	Collected Amount in Rs. Crore	Collection Efficiency		
													Input energy (MU)	Metered energy	Unmetered/assessment energy	Total energy							% of energy consumption
1	INFOPARK Phase II Kakkanad	Phase II	Phase II	Residential	0	0	0	0%	0	0	0	0%	9.40	0	0	0	0%	0.25	2.69%	0	0	0.00%	
				Agricultural	0	0	0	0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT	157	0	157	97.5%	4.57	0	4.57	64%		3.60	0	3.60	39%			3.54	3.54	100.00%	
				Commercial/Industrial-HT	3	0	3	1.9%	2.55	0	2.55	36%		5.35	0	5.35	59%			4.79	4.79	100.00%	
				Others- LT	1	0	1	0.6%	0.06	0	0.06	1%		0.19	0	0.19	2%			0.00	0.00	0.00%	
<b>Sub-total</b>					<b>161</b>	<b>0</b>	<b>161</b>	<b>100%</b>	<b>7.18</b>	<b>0</b>	<b>7.177</b>	<b>100%</b>	<b>9.40</b>	<b>9.14</b>	<b>0</b>	<b>9.14</b>	<b>100%</b>	<b>0.25</b>	<b>2.69%</b>	<b>8.33</b>	<b>8.33</b>	<b>100.00%</b>	<b>2.69%</b>
2	INFOPARK Cherthala	Cherthala	Cherthala	Residential	0	0	0	0.0%	0	0	0	0%	0.88	0	0	0	0%	0.20	22%	0	0	0.00%	
				Agricultural	0	0	0	0.0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT	24	0	24	92.3%	0.226	0	0.226	42%		0.12	0	0.12	17%			0.10	0.10	100.00%	
				Commercial/Industrial-HT	1	0	1	3.8%	0.3	0	0.3	56%		0.54	0	0.54	79%			0.50	0.50	100.00%	
				Others - LT	1	0	1	3.8%	0.01	0	0.01	2%		0.03	0	0.02674	4%			0	0	0.00%	
<b>Sub-total</b>					<b>26</b>	<b>0</b>	<b>26</b>	<b>100%</b>	<b>0.54</b>	<b>0</b>	<b>0.54</b>	<b>100%</b>	<b>0.88</b>	<b>0.68</b>	<b>0</b>	<b>0.68</b>	<b>100%</b>	<b>0.20</b>	<b>22.42%</b>	<b>0.596</b>	<b>0.596</b>	<b>100.00%</b>	<b>22.42%</b>
76	Total			Residential	0	0	0	0.0%	0	0	0	0%	10.28	0	0	0	0%	0.45	4.38%	0	0	0.00%	
				Agricultural	0	0	0	0.0%	0	0	0	0%		0	0	0	0%			0	0	0.00%	
				Commercial/Industrial-LT	181	0	181	96.8%	4.79	0	4.79	62%		3.71	0	3.71	38%			3.63	3.63	100.00%	
				Commercial/Industrial-HT	4	0	4	2.1%	2.85	0	2.85	37%		5.89	0	5.89	60%			5.29	5.29	100.00%	
				Others	2	0	2	1.1%	0.07	0	0.07	1%		0.22	0	0.22	2%			0.00	0.00	0.00%	
<b>At company level</b>					<b>187</b>	<b>0</b>	<b>187</b>	<b>100%</b>	<b>7.71</b>	<b>0</b>	<b>7.71</b>	<b>100%</b>	<b>10.28</b>	<b>9.826</b>	<b>0</b>	<b>9.83</b>	<b>100%</b>	<b>0.45</b>	<b>4.38%</b>	<b>8.92</b>	<b>8.92</b>	<b>100.00%</b>	<b>4.38%</b>

\*\* 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
	Please enter circle code
0	Please enter numeric value or 0
	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

Name of Authorised Signatory: Vijayan.V.R.  
 Name of the DISCOM: INFOPARKS KERALA POWER LICENSEE  
 Full Address:- Project Office, Park Centre, Near Thapasya Building

Signature:-  
 Name of Energy Manager: AJIN PAUL  
 Registration Number: EA-29723

Seal



B.997																				
B.998																				
B.999																				
B.1000																				
B.1001	Total (MU)															9.94	0.00	9.83		
B.1002	Net input energy at DISCOM periphery (MU)															9.94				

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.

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Name of the DISCOM: INFOPARKS KERALA POWER LICENSEE  
Full Address:-Project Office, Park Centre, Near Thapasya Building

Seal

Signature:-  
Name of Energy Manager\*: AJIN PAUL  
Registration Number: EA-29723





<b>(Details of Consumers)</b>						
<b>Summary of Energy</b>						
<b>Period April 2022 - March 2023</b>						
<b>S.No</b>	<b>Type of Consumers</b>	<b>Category of Consumers (EHT/HT/LT/Others)</b>	<b>Voltage Level (In Voltage)</b>	<b>No of Consumers</b>	<b>Total Consumption (In MU)</b>	<b>Remarks (Source of data)</b>
1	Domestic					
2	Commercial					
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					
9	HT Water Supply					
10	HT Industrial	HT	11000	4	5.89	Phase II- 5.35 MU Cherthala- 0.54 MU
11	Industrial (Small)	LT	433	181	3.71	Phase II- 3.59 MU Cherthala- 0.12 MU
12	Industrial (Medium)					
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 general					
20	Agriculture					
21	Government offices and department					
22	Others-4 (if any , specify in remarks)	LT	433	2	0.22	Station Transformer Ph II- 0.19 MU Cherthala-0.03 MU
23	Others-5 (if any , specify in remarks)					
	<b>Total</b>			<b>187</b>	<b>9.83</b>	





## **KERALA STATE PRODUCTIVITY COUNCIL**

Productivity House, H.M.T. Road,

Post Box No. 8, Kalamassery - 683104

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