24th National Awards for Excellence in Energy Management - 2023

LEKHA BHAVAN

K. Kiran Kumar, IRSEE
Senior Divisional Electrical Engineer
Hyderabad Division
South Central Railway, Secunderabad

1.Brief introduction of Lekha Bhavan

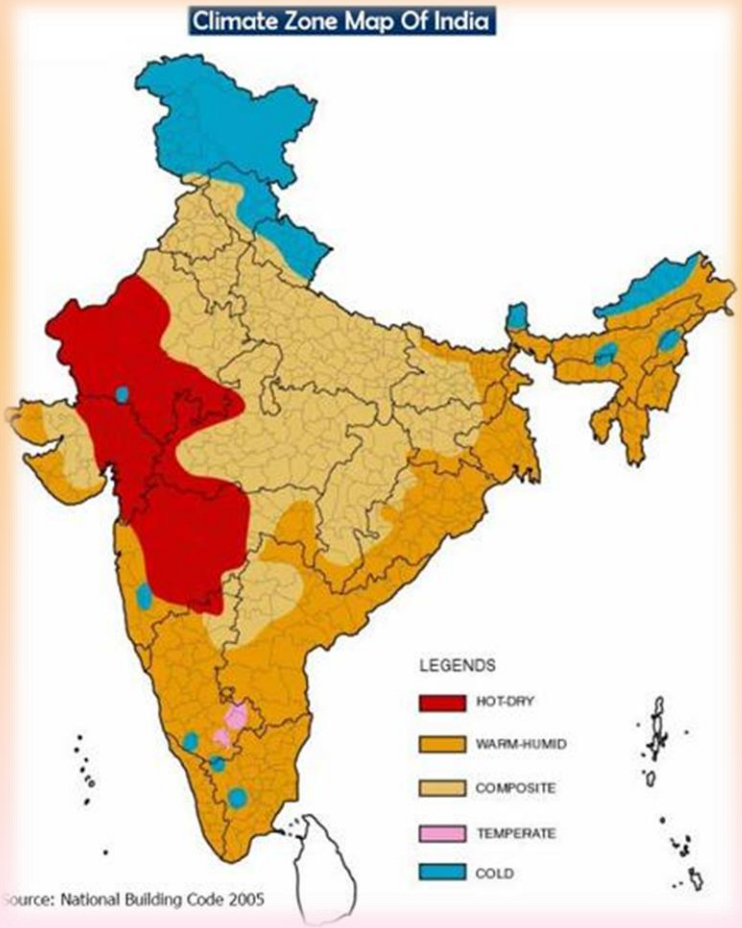
- Lekha Bhavan Office Building was built in the year 1960 and it is the Central office for the accounts department of the South Central Railway.

1.Brief introduction of Lekha Bhavan

- ✓ The core functions in the building are data processing of accounts, traffic costing, exchequer control and monitoring of funds through various accounting packages exclusively developed for Railways.
- ✓ Built up Area: 10,053 Sq.mt.
- ✓ Connected Electrical Load: 150 kW
- ✓ **First Shunya+ (Net Positive Energy) labelled building over Indian Railways.**
- ✓ **ISO 50001:2018 certified building.**
- ✓ Sources of Energy:
  - 11kV/440V Substation with 2 x 500 kVA Transformers.
  - 125 kVA Standby DG Set.
  - 100 kWp Rooftop SPV Solar Plant.

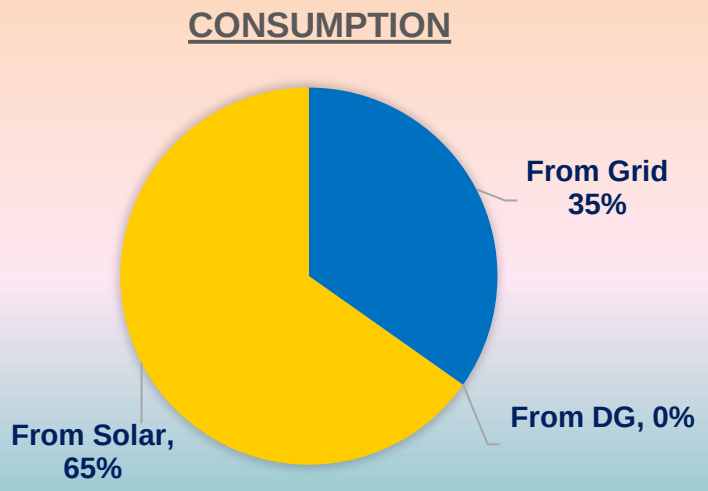
2(a).Passive Design Features

- ✓ Building Architect: Facade with front RCC.
- ✓ Integrated Block of 3 storeyed building.
- ✓ The most Significant feature of the building is that it is split into two symmetric halves. One half provided with server rooms which deals with the accounts of the entire zone and another half is filled with bustling offices.
- ✓ The entire building is surrounded by lush green patch to provide serene ambience which will also add to the energy conservation measures. The building has been provided with LED garden lights.
- ✓ This building comes in the **COMPOSITE** Climatic Zone.
- ✓ Orientation : West - South direction

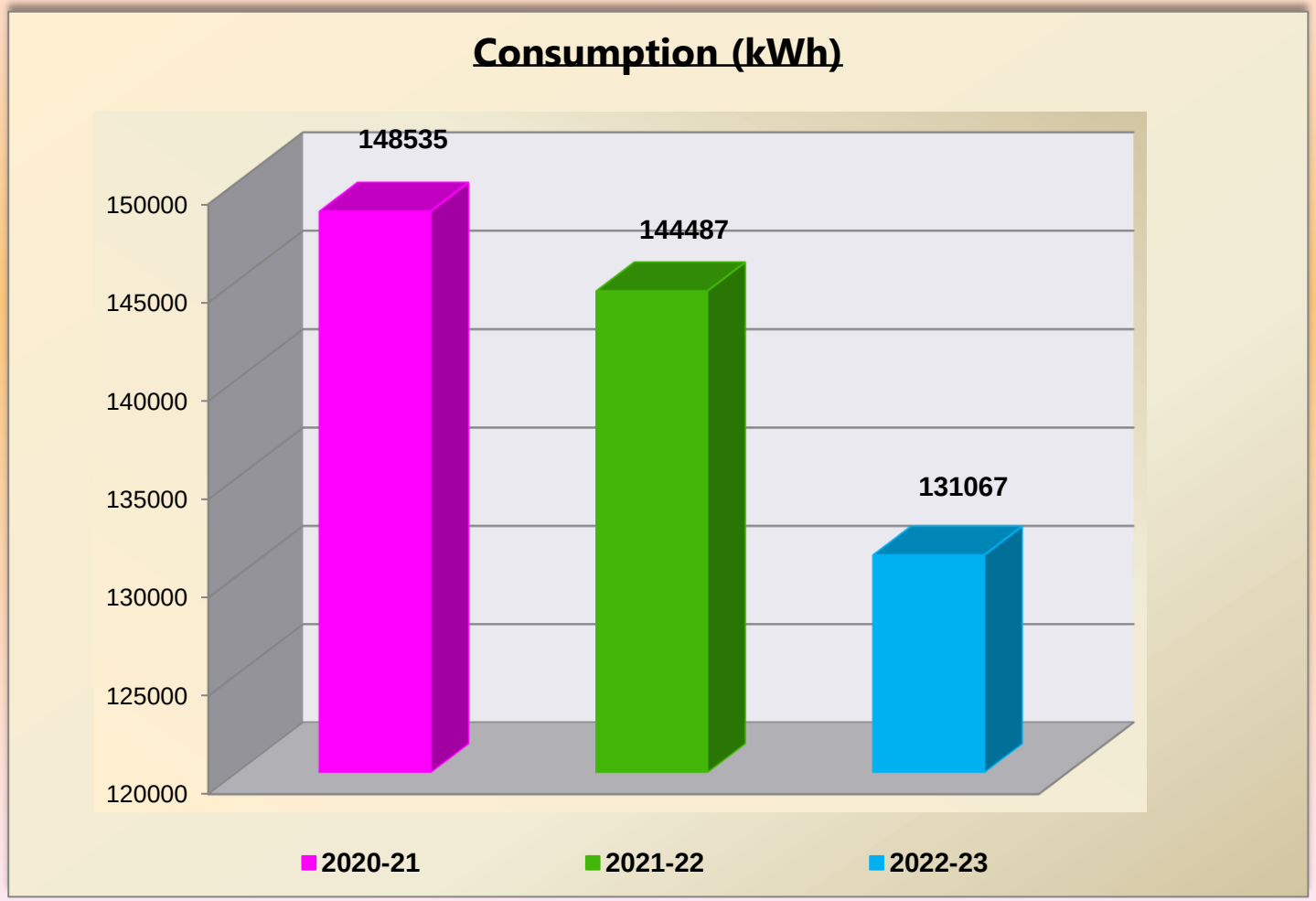


2(b). Electrical Energy Consumption Overview

Description	2020-21	2021-22	2022-23
Purchased from Grid (kWh)	63199	59628	45565
Consumption through DG set (kWh)	77	80	45
Consumption through Solar (kWh)	85259	84779	85502
Total Consumption (kWh)	148535	144487	131067
Built-up Area (Sq.mt)	10053	10053	10053
SEC (kWh/Sq.mt)	14.77	14.37	13.03

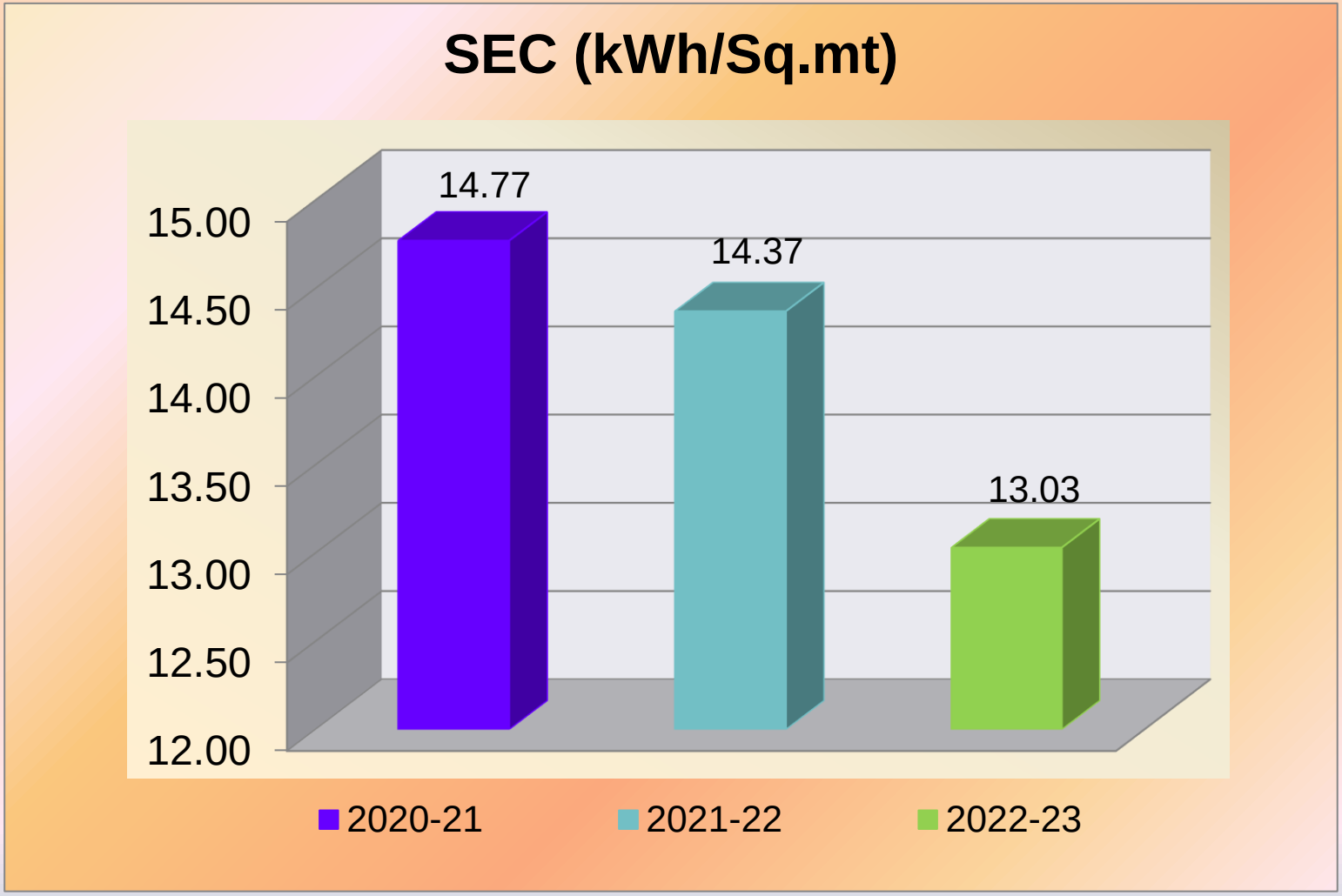


2(b). Energy Consumption Overview



Consumption was reduced by 9.28% during 2022-23 compared to 2021-22

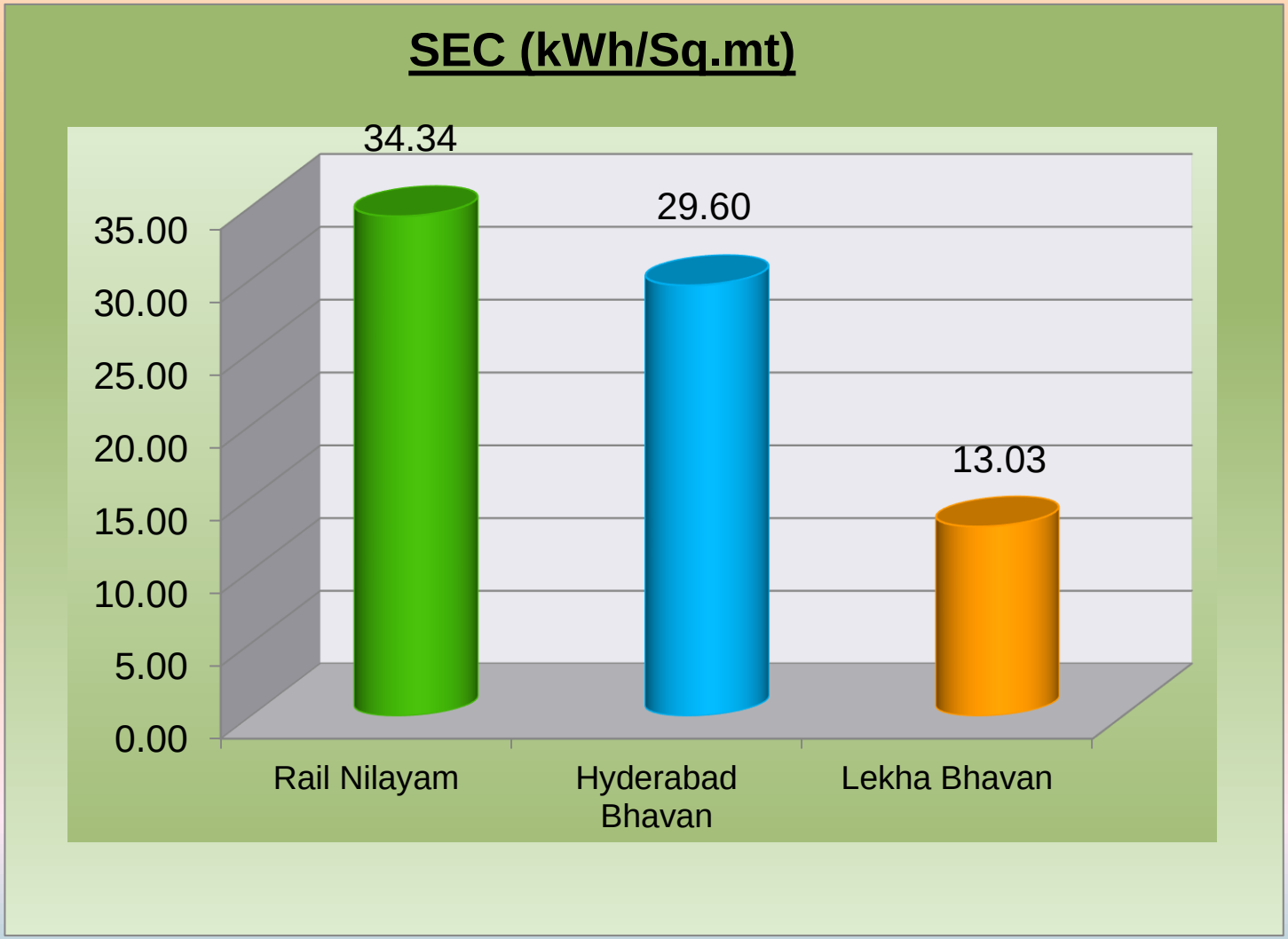
3. Sp. Energy Consumption (SEC)



SEC has been reduced in 2022-23 by 9.30% compared to 2021-22.

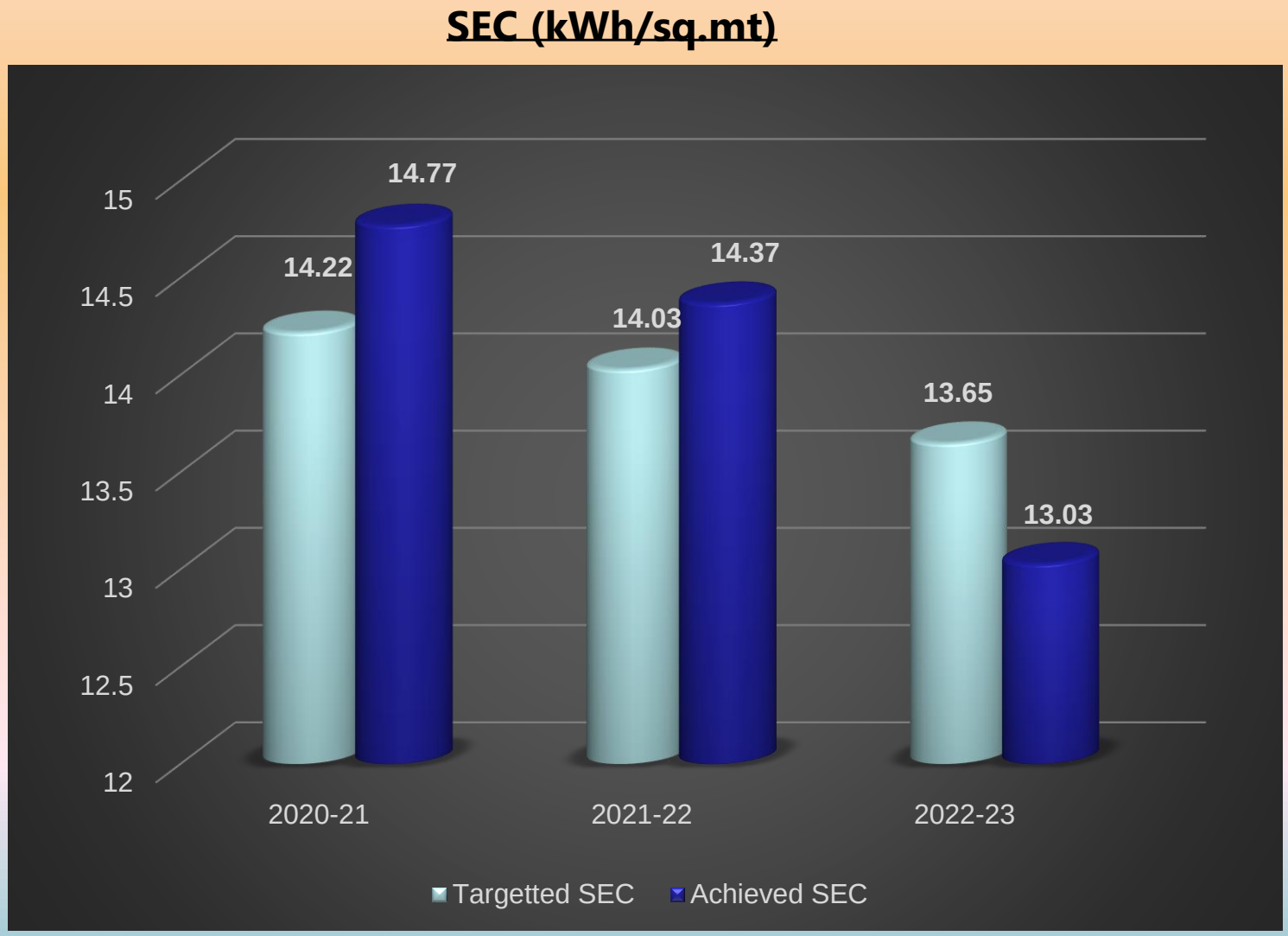
4. National Benchmarking

Direct Competitors and National Benchmarking



4. Internal Benchmarking

Target: 5% reduction in the previous years' SEC.

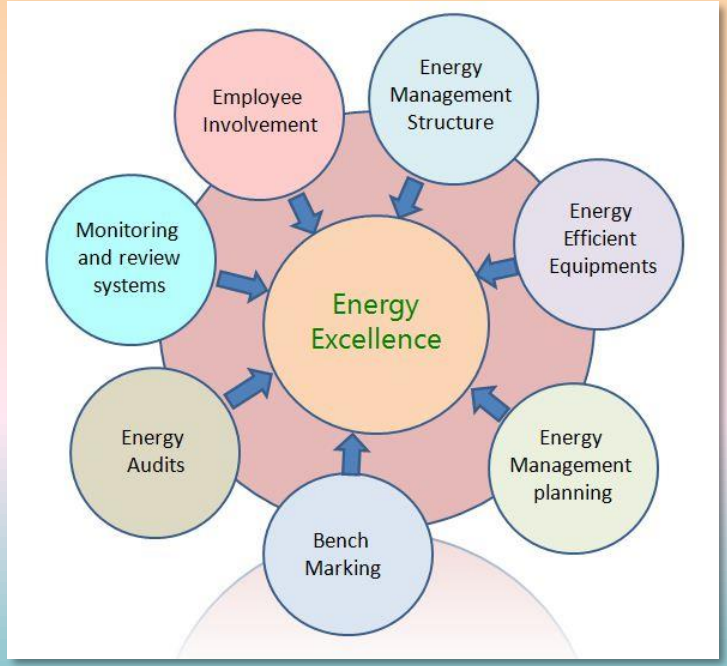


4. EnCon Projects planned in 2023-24

- ✓ IOT based Energy Monitoring System
- ✓ Web based Intelligent Water Management System.
- ✓ Low carbon cooling system
- ✓ Automation of Pumps
- ✓ Power Quality Restorers
- ✓ Water conservation by implementing the water saving adaptors.
- ✓ Introduction of E-Vehicle and increase in existing fleets.

Achieving Energy Efficiency - A Multi Pronged Approach

- ✓ Targeted energy conservation action plan & Implementation.
- ✓ Low cost Innovation & use of new technology.
- ✓ Continuous energy monitoring and Corrections.
- ✓ Energy Audits by In House BEE Accredited Auditors.
- ✓ Renewable energy Initiatives.
- ✓ Very well maintained electrical equipment.
- ✓ Energy Conservation Week celebration and Mass Awareness Program.



5. EnCON Projects Implemented from 2020-21 to 2022-23

Energy Saving Projects 2020-21

Some of the major Energy Saving Projects implemented.

Sl. No.	Project Description	Savings in Lakh Rs.	Investment in Lakh Rs.	Payback Period in years
1	Replacement of conventional pump with Energy efficient pump	0.29	0.65	2.2
2	Energy savers for AC Units	0.33	0.40	1.2
3	Replacement of star rating Ceiling fans with 28W BLDC ceiling fans	0.70	1.00	1.4

Energy Saving Projects 2021-22

Some of the major Energy Saving Projects implemented.

Sl. No.	Project Description	Savings in Lakh Rs.	Investment in Lakh Rs.	Payback Period in years
1	Occupancy sensors for ACs	3.49	0.35	0.1
2	Occupancy sensors for lights	1.75	0.60	0.3
3	Timers for highmast lighting	0.42	0.18	0.4
4	Timers for water coolers	0.36	0.06	0.2
5	Provision of VVF Drives for Lifts	0.29	0.60	2.0

Energy Saving Projects 2022-23

Some of the major Energy Saving Projects implemented.

Sl. No.	Project Description	Savings in Lakh Rs.	Investment in Lakh Rs.	Payback Period in years
1	Temperature setting of 18 deg C to 22 deg C in Water coolers	0.43	0	-
2	Temperature setting of 22 deg C to 26 deg C in AC	3.23	0	-
3	Occupancy sensors for ACs	3.98	0.40	0.1
4	Energy Efficient Pumps/Automation	0.68	0.35	0.5
5	Energy Efficient Inverter AC units	1.20	4.32	3.6

6.Innovative Projects Implemented

Innovative Projects implemented

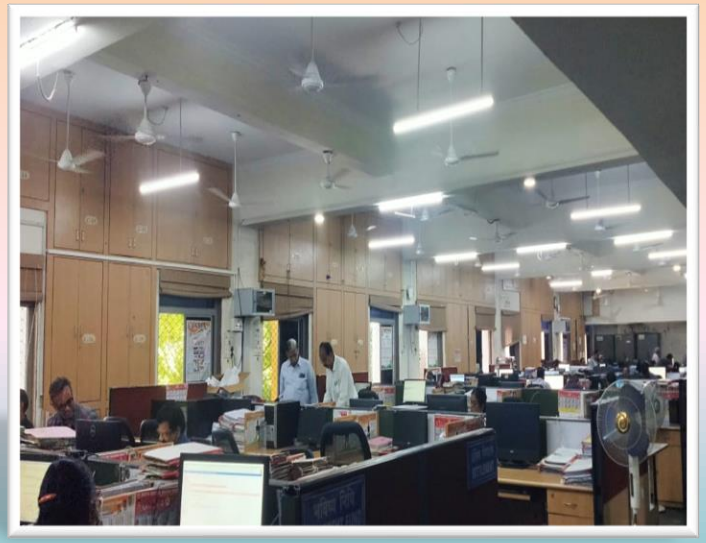
Sl. No.	Name of the Project	Year of Implementation	Savings in Lakh Rs.	Investment in Lakh Rs.
1	Provision of Energy efficient BLDC fans i.e., adopting of super energy efficient fans	2022-21	0.70	1.00
2	Provision of 5 star rated energy efficient Inverter type AC units which uses eco friendly refrigerant (R-410A)	2021-22	1.20	4.32
3	Provision of VVVF Drives for Lifts	2021-22	1.63	0.50
4	Automation of Pumps	2022-23	0.68	0.35
5	Temperature setting of 22 deg C to 26 deg C in AC	2022-23	3.23	-
6	Temperature setting of 18 deg C to 22 deg C in Water coolers	2022-23	0.43	-

7a.Utilisation of Renewable Energy Sources

Year	Technology	Type of Energy	Onsite/ Offsite	Installed capacity	Generation in kWh	% of overall electrical energy
2020-21	Solar PV	Electrical	Onsite	50 kWp	85259	57.39
2021-22	Solar PV	Electrical	Onsite	50 kWp	84779	58.67
2022-23	Solar PV	Electrical	Onsite	100 kWp	173478	132.35

Other Energy Conservation Measures

100% LED Lighting

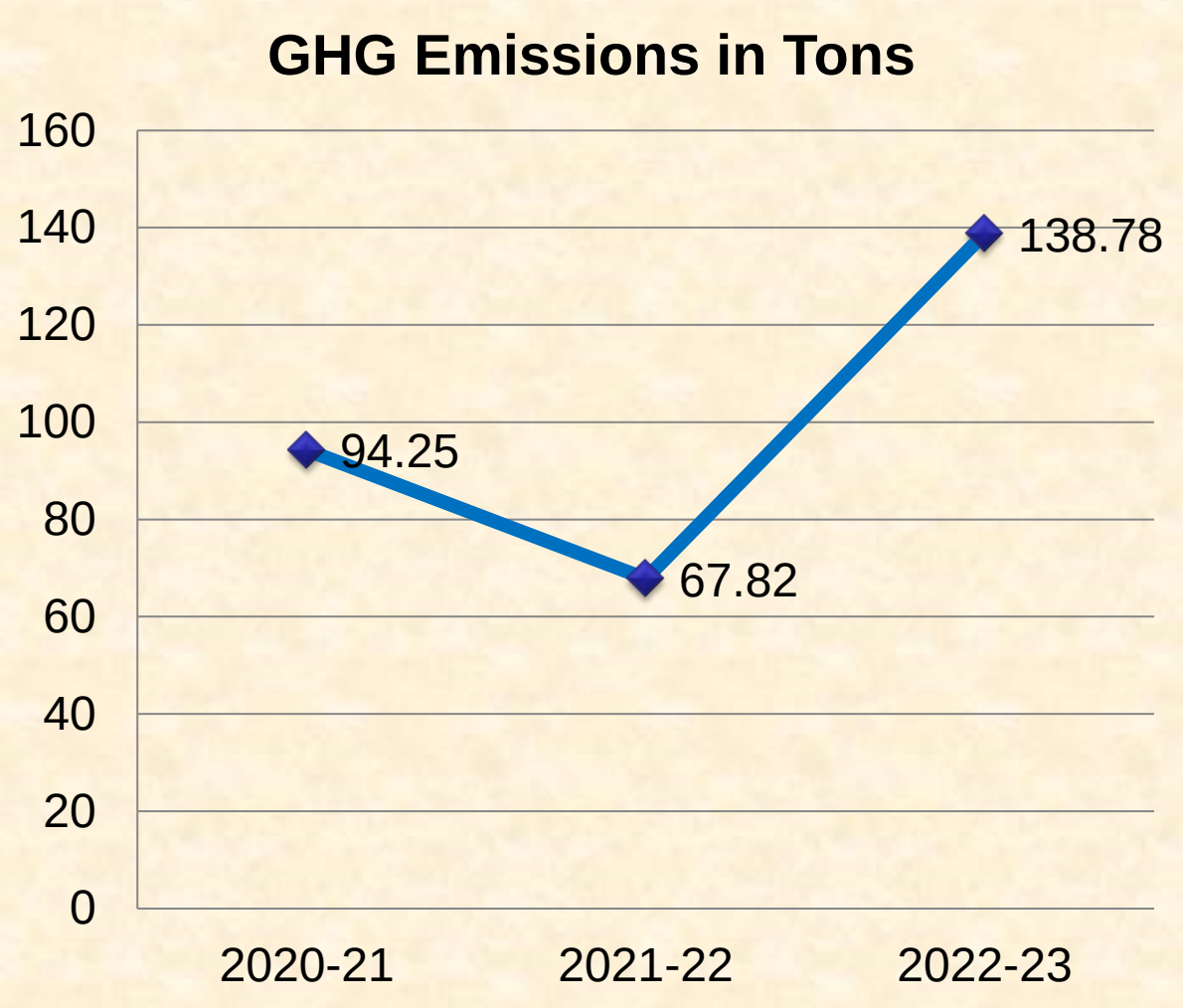


Natural Day Light Pipe System

Use of Occupancy Sensors & Energy Savers

8.GHG EMISSIONS & INDOOR AIR QUALITY

8. GHG Emissions and Indoor Air Quality



- By provision of 100 kWp CO_2 emissions reduced by 138.78 Tons

Energy Conservation and GHG Policy

Energy Conservation Policy of Hyderabad Division

1. Daily monitoring the Energy consumption through specially designed software.
2. Creating awareness among the users through various activities such as brochures / seminars.
3. To minimize the specific energy consumption w.r.t previous years.
4. Conducting of regular inter departmental energy audits aimed to minimize the energy losses.
5. Implemented the action plan of energy conservation items to reduce the Energy Consumption at least by 10% every year w.r.t. previous years targets.
6. Promote use of the renewable sources of energy.
7. Use of latest BEE 5 star rated Electrical Fittings and Equipments.

K. Kiran Kumar
Senior Divisional Electrical Engineer,
Hyderabad Division, South Central Railway.

GHG Policy of Hyderabad Division

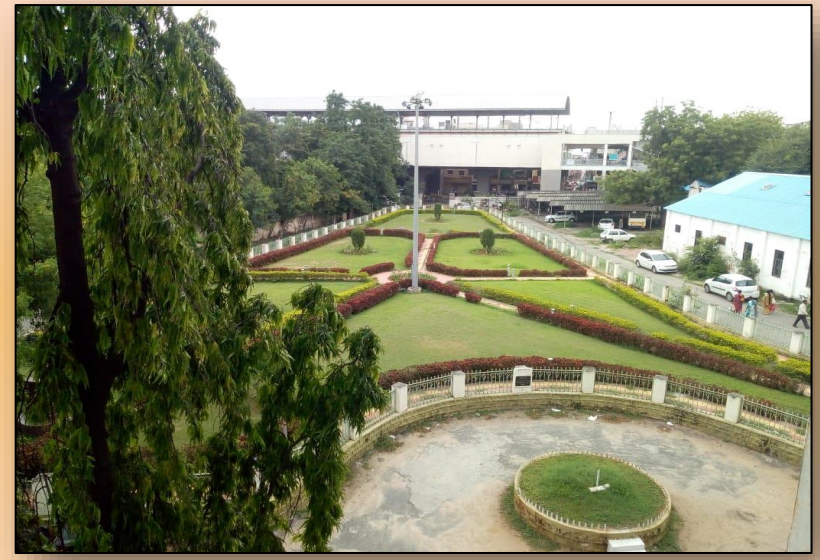
1. We committed to use products which reduce the GHG emission.
2. Using of eco-friendly refrigerants in HVACs, Refrigerators, Water Coolers etc.
3. Converting Existing Office Buildings into Green Buildings.
4. Use of Solar and Wind Energy.
5. Ensuring availability of resources for continual reduction of GHG emissions intensity.

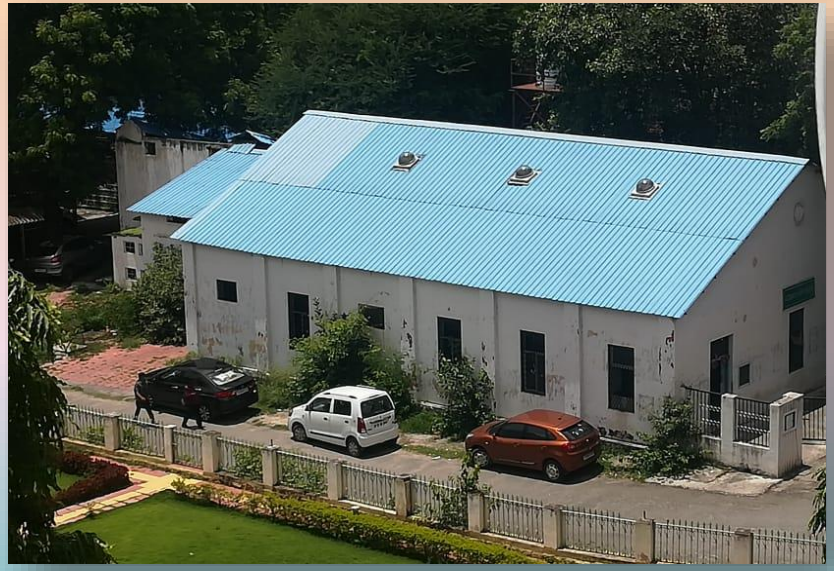
K. Kiran Kumar
Senior Divisional Electrical Engineer,
Hyderabad Division, South Central Railway.

Green Initiatives and Features at Lekha Bhavan

- Building has Green tree façade by Asoka (saraca-asoca) tree
- Roof top 100 kWp solar power plant
- Day light pipe system
- Sun control film on window pans
- Massive tree plantations
- e-office working system
- LED signage and name boards
- Occupancy indicators and display panels
- Pan IR video conference system
- In building potted plantation
- Segregation of waste and waste management
- Periodical Energy Audits

Green Initiatives and Features





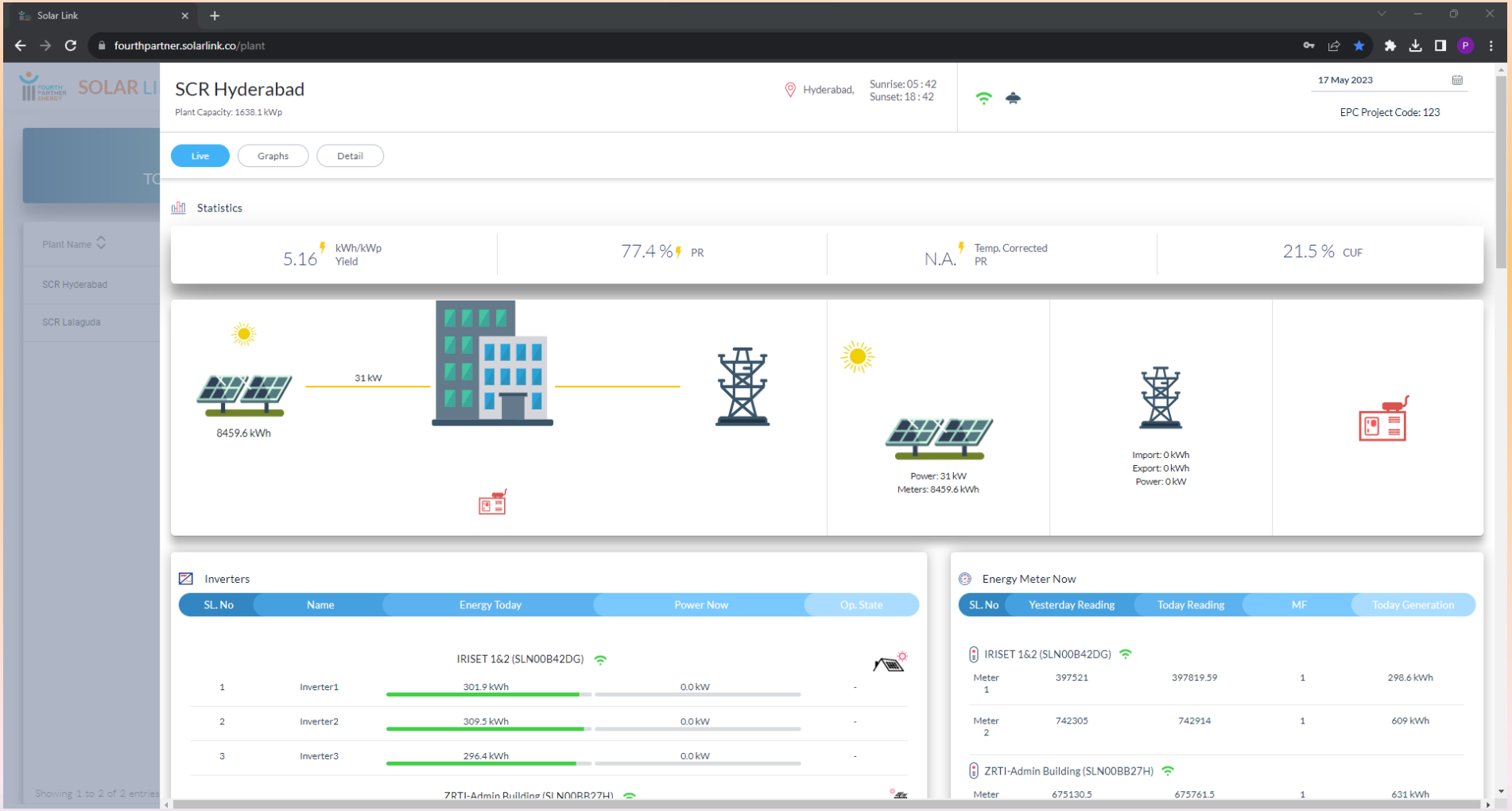
Waste Management

- Building is provided with separate garbage bins for collection of dry and wet waste.
- EN & HM Department is educating the employees about segregation wet and dry waste.
- Daily collection and segregation of dry and wet waste from each floor and effective disposal of the same.

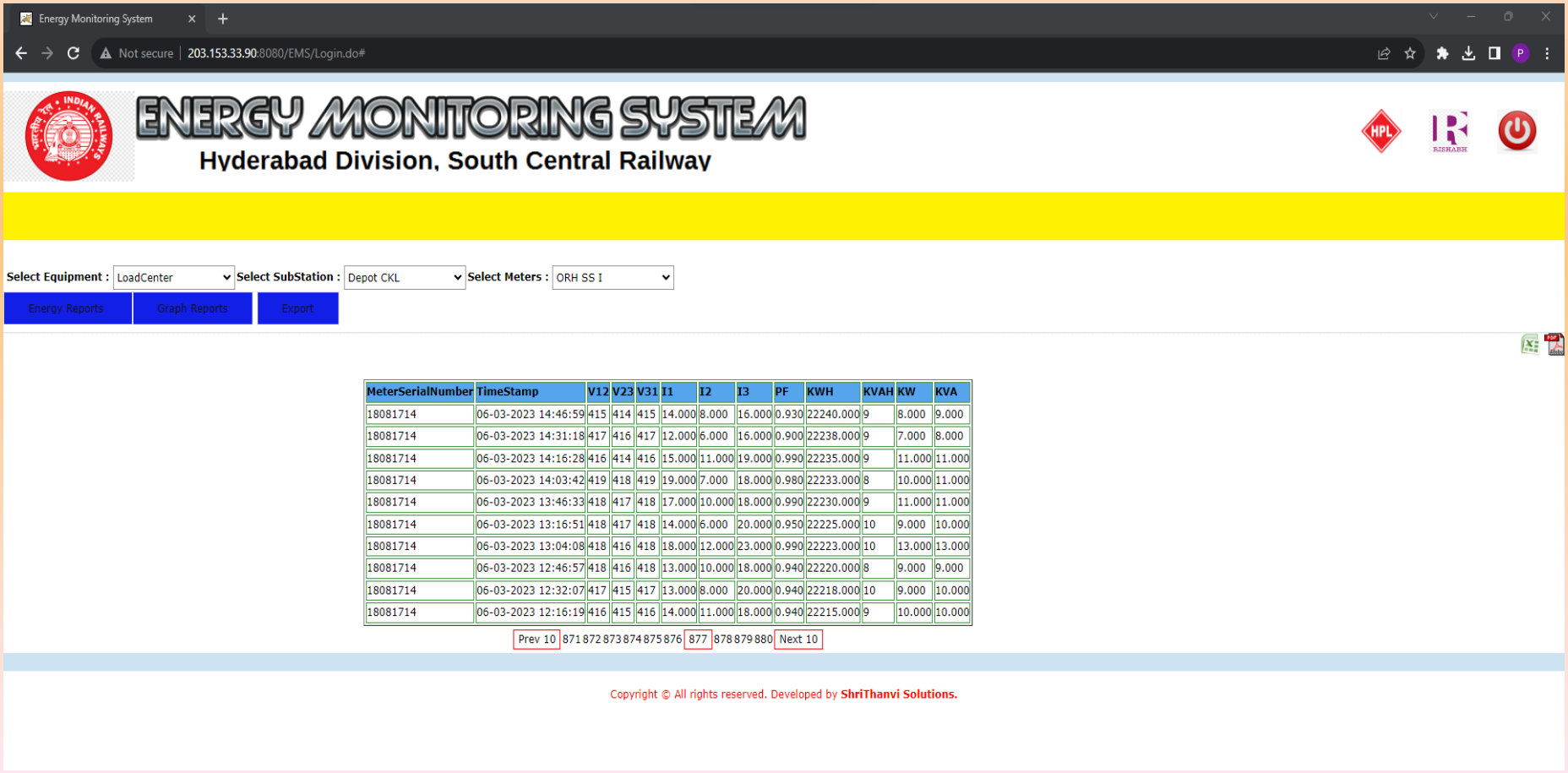
Team Work, Employee Involvement & Monitoring

9.BMS & Certification

On line Energy Monitoring



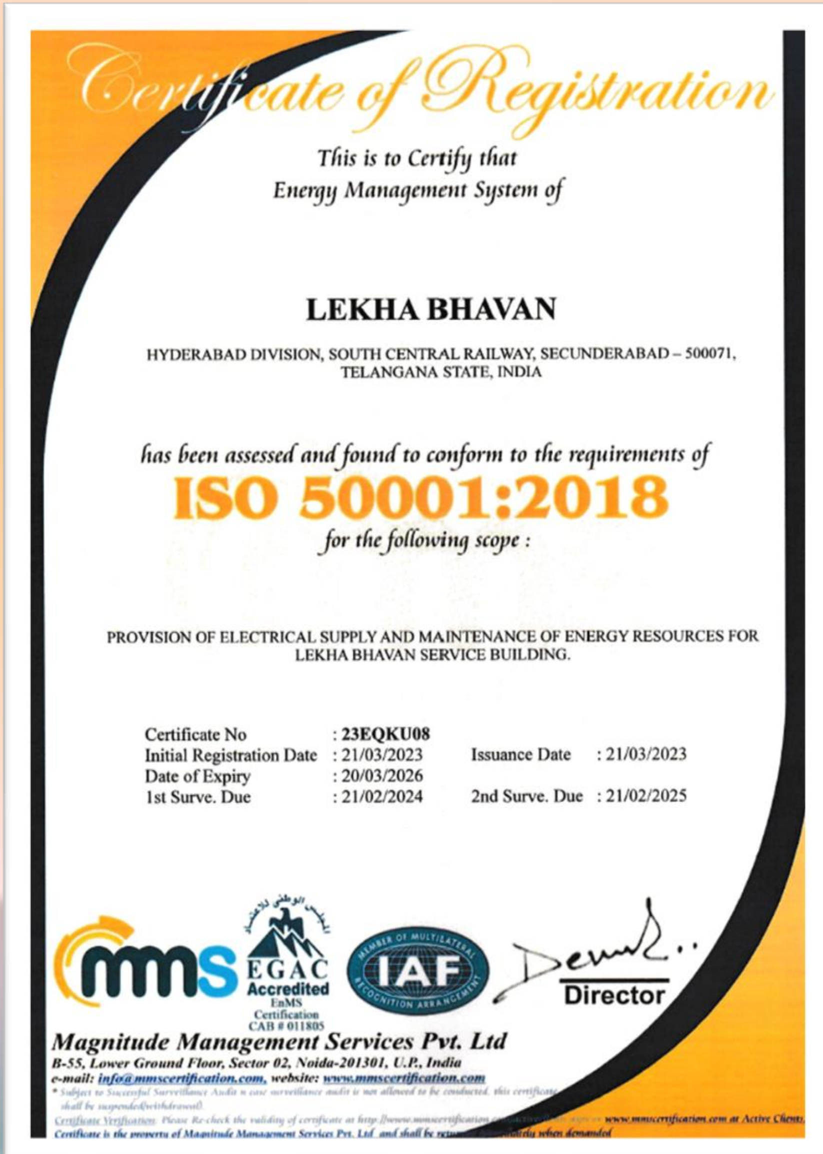
On line Energy Monitoring



MeterSerialNumber	TimeStamp	V12	V23	V31	I1	I2	I3	PF	KWH	KVAH	KW	KVA
18081714	06-03-2023 14:46:59	415	414	415	14.000	8.000	16.000	0.930	22240.000	9	8.000	9.000
18081714	06-03-2023 14:31:18	417	416	417	12.000	6.000	16.000	0.900	22238.000	9	7.000	8.000
18081714	06-03-2023 14:16:28	416	414	416	15.000	11.000	19.000	0.990	22235.000	9	11.000	11.000
18081714	06-03-2023 14:03:42	419	418	419	19.000	7.000	18.000	0.980	22233.000	8	10.000	11.000
18081714	06-03-2023 13:46:33	418	417	418	17.000	10.000	18.000	0.990	22230.000	9	11.000	11.000
18081714	06-03-2023 13:16:51	418	417	418	14.000	6.000	20.000	0.950	22225.000	10	9.000	10.000
18081714	06-03-2023 13:04:08	418	416	418	18.000	12.000	23.000	0.990	22223.000	10	13.000	13.000
18081714	06-03-2023 12:46:57	418	416	418	13.000	10.000	18.000	0.940	22220.000	8	9.000	9.000
18081714	06-03-2023 12:32:07	417	415	417	13.000	8.000	20.000	0.940	22218.000	10	9.000	10.000
18081714	06-03-2023 12:16:19	416	415	416	14.000	11.000	18.000	0.940	22215.000	9	10.000	10.000

Prev 10 871 872 873 874 875 876 877 878 879 880 Next 10

ISO 50001:2018 Certification


Certificate of Registration

This is to Certify that
Energy Management System of

LEKHA BHAVAN

HYDERABAD DIVISION, SOUTH CENTRAL RAILWAY, SECUNDERABAD – 500071,
TELANGANA STATE, INDIA

has been assessed and found to conform to the requirements of

ISO 50001:2018

for the following scope :

PROVISION OF ELECTRICAL SUPPLY AND MAINTENANCE OF ENERGY RESOURCES FOR LEKHA BHAVAN SERVICE BUILDING.

Certificate No	: 23EQKU08		
Initial Registration Date	: 21/03/2023	Issuance Date	: 21/03/2023
Date of Expiry	: 20/03/2026		
1st Surve. Due	: 21/02/2024	2nd Surve. Due	: 21/02/2025

EGAC Accredited
EnMS Certification
CAB # 011805

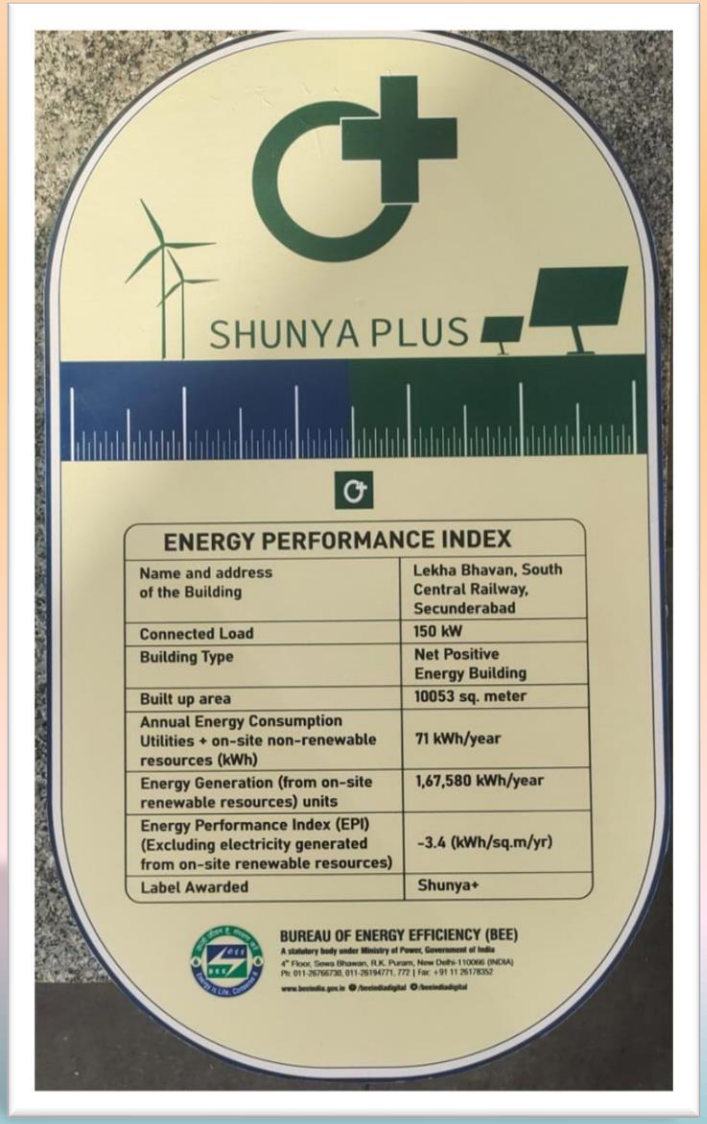
Director

Magnitude Management Services Pvt. Ltd
B-55, Lower Ground Floor, Sector 02, Noida-201301, U.P., India
e-mail: info@mmscertification.com, website: www.mmscertification.com
* Subject to Successful Surveillance Audit in case surveillance audit is not allowed to be conducted, this certificate shall be suspended(withdrawal).
Certificate Verification: Please Re-check the validity of certificate at http://www.mmscertification [illegible] www.mmscertification.com at Active Clients.
Certificate is the property of Magnitude Management Services Pvt. Ltd. and shall be [illegible] when demanded

ISO 50001:2018
Energy Management System

ISO 50001
ENERGY MANAGMENT

First Shunya+ Labelled building over Indian Railways



ऊर्जा दक्षता ब्यूरो
(भारत सरकार, विद्युत मंत्रालय)
BUREAU OF ENERGY EFFICIENCY
(Government of India, Ministry of Power)

आज़ादी का अमृत महोत्सव

No.: BEE/Shunya-Labelling/Certificates/23-24/01

*It is certified that **Lekha Bhavan, South Central Railway, Secunderabad** has been awarded a* BEE ***Shunya Plus*** *Label with the details below:*

Name and address of the building	*Lekha Bhavan, South Central Railway, Secunderabad*
Connected load	*150 kW*
Building Type	*Net Positive Energy Building*
Built up area	*10053 sq. meter*
Annual Energy Consumption (Utilities + on-site non- renewable resources (kWh))	*71 kWh/year*
Energy Generation (from on-site renewable resources) units	*1,67,580 kWh/year*
Energy Performance Index (EPI) (Excluding electricity generated from on-site renewable resources)	*-3.4 (kWh/sq.m/yr)*
Label Awarded	*Shunya+*

The label would be valid for a period of 3 years from the date of issue.

Date: 10th April 2023

(Saurabh Diddi)
Director

स्वहित एवं राष्ट्रहित में ऊर्जा बचाएँ Save Energy for Benefit of self and Nation

चौथा तल, सेवा भवन, आर॰ के॰ पुरम, नई दिल्ली-110 066, वेबसाईट / Website : www.beeindia.gov.in
4th Floor, Sewa Bhawan, R.K. Puram, New Delhi-110 066, दूरभाष / Tel. : 91 (11) 26766700, फैक्स / Fax : 91 (11) 20867402

10. Net Zero Action Plan

10. Net Zero Action Plan

- **Lekha Building has been declared as "Net Positive Energy Building" by Bureau of Energy Efficiency.**

- **To maintain Net Positive Energy on future expansion of loads the following action plan was made.**

  i. Implementation of SMART Energy Management System.
  ii. Provision of more number solar street lighting.
  iii. Provision of Energy efficient Pumps
  iv. Use of IoT Technology for Electrical Energy Monitoring and Controlling.
  v. Water conservation by implementing the water saving adaptors.
  vi. Introduction of E-Vehicle and increase in existing fleets.
  vii. EV charging station for employees at office.

Awards & Achievements

Telangana State Energy Conservation Awards - 2022

- ✓ Lekha Bhavan Building has received **Silver Award** in Government Buildings category by TSREDCO, Government of Telangana.

22nd National Award for Excellence in Energy Management - 2021

✓ Lekha Bhavan Building has received **Energy Efficient Unit** Award by CII

CII

Confederation of Indian Industry

22nd National Award for Excellence in Energy Management 2021

This is to certify that

Lekha Bhavan, Secunderabad

has been recognized as

"Energy Efficient Unit"

This acknowledgement is based on the evaluation by the panel of judges at the "National Award for Excellence in Energy Management" held during 24 - 27 August 2021.

K S Venkatagiri
Executive Director
CII - Godrej GBC

Ravichandran Purushothaman
Chairman, Energy Efficiency Council
CII - Godrej GBC

Telangana State Energy Conservation Awards - 2020

- ✓ Lekha Bhavan Building has won **Silver Award** in Government Buildings category announced by TSREDCO, Government of Telangana for the year 2020.

21st National Awards for Excellence in Energy Management - 2020

✓ Lekha Bhavan Building has won **Energy Efficient Unit** Award by CII

CII

Confederation of Indian Industry

125 Years - Since 1895

21st National Award for Excellence in Energy Management 2020

This is to certify that

Lekha Bhavan, South Central Railway, Secunderabad

has been recognized as

"Energy Efficient Unit"

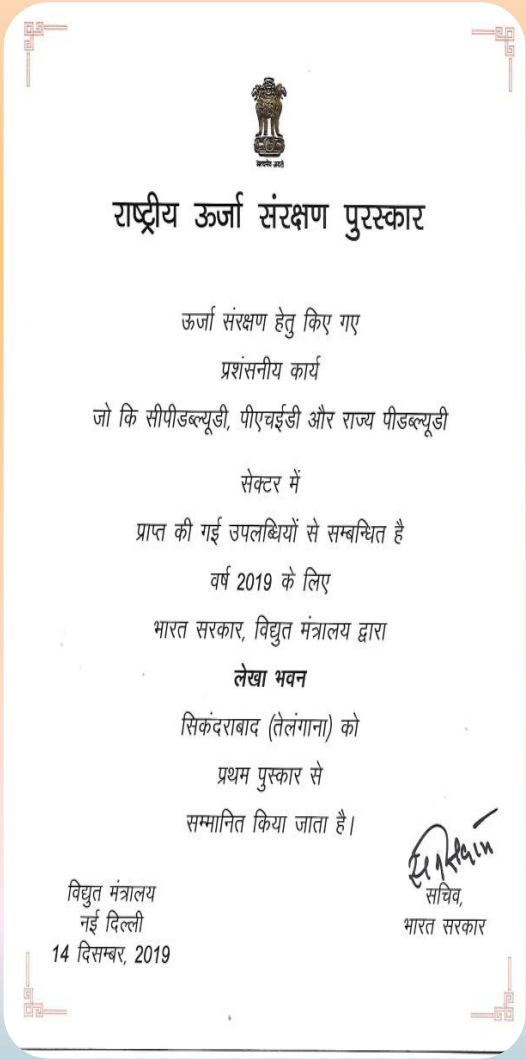
This acknowledgement is based on the evaluation by panel of judges at the "National Award for Excellence in Energy Management" held during 25 - 28 August 2020.

K S Venkatagiri
Executive Director
CII - Godrej GBC

Ravichandran Purushothaman
Chairman, Energy Efficiency Council
CII - Godrej GBC

National Energy Conservation Awards - 2019

✓ Lekha Bhavan Building has bagged First Prize in Office buildings Category by BEE



राष्ट्रीय ऊर्जा संरक्षण पुरस्कार

ऊर्जा संरक्षण हेतु किए गए

प्रशंसनीय कार्य

जो कि सीपीडब्ल्यूडी, पीएचईडी और राज्य पीडब्ल्यूडी

सेक्टर में

प्राप्त की गई उपलब्धियों से सम्बन्धित है

वर्ष 2019 के लिए

भारत सरकार, विद्युत मंत्रालय द्वारा

लेखा भवन

सिकंदराबाद (तेलंगाना) को

प्रथम पुस्कार से

सम्मानित किया जाता है।

विद्युत मंत्रालय
नई दिल्ली
14 दिसम्बर, 2019

सचिव,
भारत सरकार

11. Learning from Previous Years CII Energy Awards

- Interaction with professional peers of other buildings & implemented new ideas.
- R&D buildings and IT buildings are different with regard to energy usage.
- GHG emission classification under Scope 01, Scope 02 & Scope 03.
- Clarity on EPI/SEC & Contribution to Nation Building.
- BMS system.

Contact No. 9701372300
e-mail: srdeemhyb@gmail.com