

SURVEILLANCE ENERGY AUDIT REPORT

OF

GLOBAL ACADEMY OF TECHNOLOGY

RAJARAJESWARI NAGAR, BENGALURU – 560 098

DECEMBER 2025



ECO ENERGI ME ENGINEERS LLP

ENHANCING RESOURCE EFFICIENCY

SURVEILLANCE ENERGY AUDIT REPORT
OF
GLOBAL ACADEMY OF TECHNOLOGY
RAJARAJESWARI NAGAR, BENGALURU – 560 098
DECEMBER 2025

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We would be happy to provide any further clarifications, if required, to facilitate the implementation of the recommendations.

We received full co-operation and support from the concerned personnel/ staff members of the college. They took key interest and gave valuable inputs during the course of study. We would like to thank:

Principal – Global Academy of Technology, Bengaluru

And other Staff in personnel who have given full co-operation and support. They took a keen interest and gave valuable inputs during the course of study.



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Green Audit | Electrical Safety Audit | Occupational Health and Safety Audit
Bureau of Energy Efficiency Accredited Energy Audit Firm (AEA)

Certificate


This is to certify that M/s. Eco Energime Engineers LLP, Bengaluru has conducted **Surveillance Energy Audit** of “**Global Academy of Technology, Rajarajeswari Nagar, Bengaluru – 560 098**” during December 2025.

The audit involves field visit, observations, verification of bills, log books, data base, maintenance registers and interview with staffs, and this gives an overview of the existing system. In an opinion and to the best of our information and according to the information given to us, said Energy Audit gives a true and fair view in conformity with auditing principles.

Global Academy of Technology, Rajarajeswari Nagar, Bengaluru, has taken substantial steps towards optimizing their energy utilization and, contributing to an environmentally sustainable future.

For Eco Energime Engineers LLP


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EEELLP ACKNOWLEDGEMENT

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Surveillance Energy Audit Report of Global Academy of Technology,
Bengaluru



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DISCLAIMER

The audit team has prepared this report for **Global Academy of Technology, Rajarajeswari Nagar, Bengaluru** based on input data submitted by the representatives of College complemented with the best judgment capacity of the expert team.

While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the recommendations are arrived following best judgments and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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Surveillance Energy Audit Report of Global Academy of Technology,
Bengaluru

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ABBREVIATION AND ACRONYMS

1.	A	:	Amperes
2.	DG	:	Diesel Generators
3.	E-Waste	:	Electronic Waste
4.	etc.	:	Etcetera
5.	FTL	:	Fluorescent Tube Light
6.	GHG	:	Green House Gas
7.	Hz	:	Hertz
8.	HP	:	Horse Power
9.	HT	:	High Tension
10.	I	:	Current
11.	ICT	:	Information and Communications Technology
12.	kL	:	Kilo Liters
13.	kV	:	kilo volt
14.	kVA	:	kilo volt ampere
15.	kW	:	Kilo Watt
16.	kWh	:	kilo Watt hour
17.	kWp	:	kilo Watt peak
18.	LCD	:	Liquid Crystal Display
19.	LED	:	Light Emitting Diode
20.	MoU	:	Memorandum of Understanding
21.	NA	:	Not Applicable
22.	NAAC	:	National Assessment and Accreditation Council
23.	Nos.	:	Numbers
24.	NSS	:	National Service Scheme
25.	Rs.	:	Rupees
26.	RR. No.	:	Revenue Register Number.
27.	S. No.	:	Serial Number
28.	Sq. Ft.	:	Square Feet
29.	Sq.m.	:	Square Meter
30.	SRTPV	:	Solar Roof Top Photo Voltaic
31.	TL	:	Tube Light
32.	TR	:	Ton of Refrigeratio
33.	UG	:	Under Graduate
34.	V	:	Volts
35.	W	:	Watts
36.	Wi-Fi	:	Wireless Fidelity
37.	Wp	:	Watt peak
38.	#	:	Number

EXECUTIVE SUMMARY

Conducting Surveillance Quality Audit covering areas such as water audit, energy audit, waste management audit, green campus management audit and environment audit (carbon foot print perspective only), in college helps to increase the awareness levels of stakeholders, staffs and students, to understand its advantages towards impact on sustainable future.

The Global Academy of Technology, Rajarajeswari Nagar, Bengaluru is very **well maintained, clean and neat**, which emphasis the resource allocation (man power, finance and support) by management and importance given for **clean and hygiene environment for students, staffs and stakeholders**.

The environmental awareness initiatives are **substantial**. The installation of solar PV systems, solar hot water systems, Heat pump based hot water system, STP treated water for flushing / gardening purposes, and rain water harvesting system are is **noteworthy**. Besides, environmental awareness programme initiated by the management and administration shows how the campus is going green.

As part of Quality Audit of campus, we carried out campus monitoring, including Illumination and Ventilation of the class room. It was observed that Illumination and Ventilation is **adequate** considering natural light and fresh air circulation.

From the Quality Audit study, it was observed the college had taken various initiatives and implemented best practices in conserving natural resources that include:

A Best Practices Implemented for Energy Conservation

- Day light integration in class rooms, staff rooms, hostels and common areas
- Use of LED lights for interior (class rooms, office rooms, hostels, common areas, etc.) and external applications (street lights)
- Grid tied Solar Roof Top Photo Voltaic (SRTPV) system for power generation
- Use of energy efficient air conditioning systems such as VRV and inverter AC units
- Use of Solar water heaters and heat pumps for hot water generation
- Use of LED/ LCD monitors
- Use of sign boards and posters for awareness creation

Surveillance Quality Audit will be a valuable tool in the management and monitoring of environmental and sustainable development programs of the college. The cumulative savings for two years (23-24 & 24-25) of the above initiatives are given in table below.

S. No.	Description	Details	Energy savings, kWh	Cost Savings, Rs. Lakh	Investment Cost, Rs. Lakh	CO2 emission reduction
1	Solar Roof Top Photovoltaic System	150 kWp	367500	35	135	290.4
2	Sewage Treatment Plant	200 kLD	--	31.8	150	--
4	Solar Water Heater	20 kL	348837.2	33.2	30	275.6
5	LED Fixtures		137600	13	10.7	108.8
7	Energy Efficient Air Conditioning Units	300 TR	672000	53.8	90	512.8
8	Heat Pumps	2 Nos.	279070	26.6	12	220.4
	Total			193.4	427.7	1408

The various initiatives implemented have resulted in **Rs. 427.7 lakh** of cost savings for two years (23-34 & 24-25) and **1408 MT of CO₂** emission reduction, which is **substantial achievement**.

1. INTRODUCTION

Global Academy of Technology (GAT), established in the year 2001, is one of the most sought-after engineering and management colleges in Bengaluru, Karnataka. Located in a sprawling campus of 10-acre land, GAT is a campus ideal for students to hone their academics in an atmosphere of optimism.

GAT provides ample opportunities for various co-curricular and extra-curricular activities for the students. The campus brims with more than 3500 students and 300 experienced staff involved in effective Teaching and Learning Process. Academics is supplemented with mentoring, peer learning and counselling to ensure holistic development of students. GAT has academic alliances with various institutions, industries, and research organizations to provide industry perspective to the students.

VISION

“Become a premier institution imparting quality education in engineering and management to meet the changing needs of society”

MISSION

- Create environment conducive for continuous learning through quality teaching and learning processes supported by modern infrastructure
- Promote Research and Innovation through collaboration with industries
- Inculcate ethical values and environmental consciousness through holistic education programs

Facilities available for physical wellness

The management has provided playground for sports activities. Pictures of the playground (cricket, volleyball, basketball, are given in figure 1.1, indoor game area is shown in figure 1.2, and gym area is given in figure 1.3..



Figure 1-1: Playground in the college campus

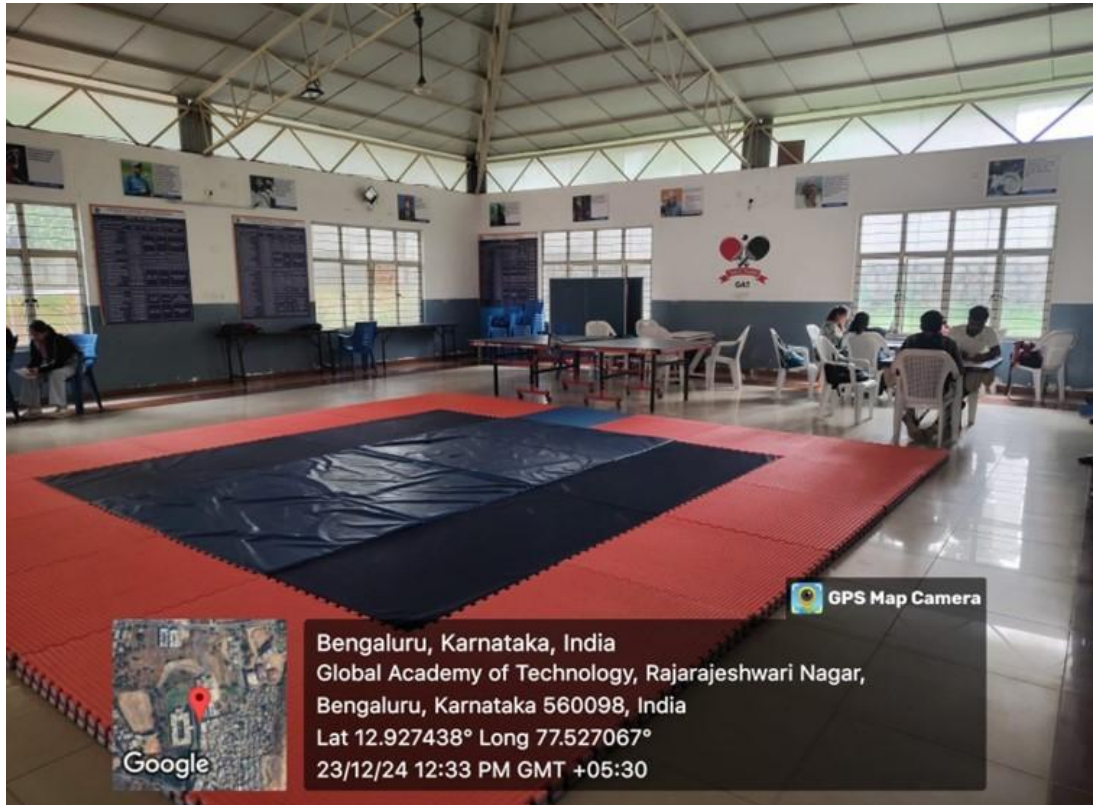


Figure 1-2: Indoor game

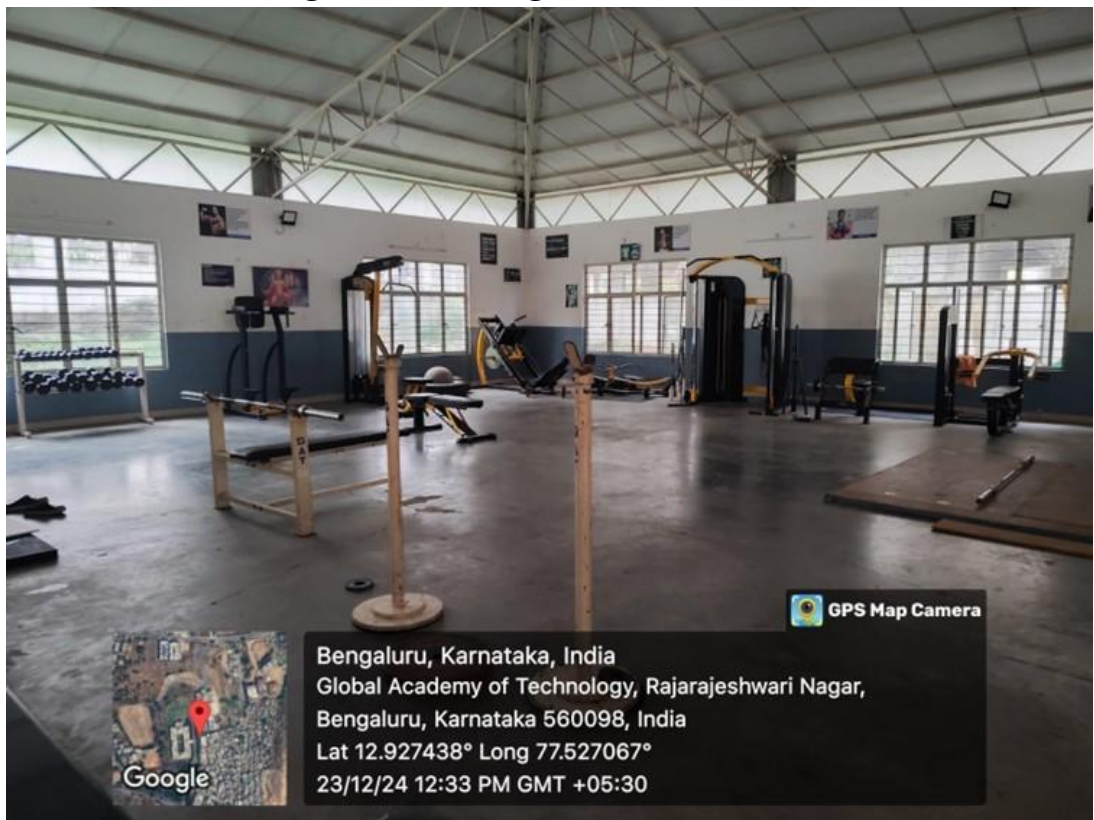


Figure 1-3: Indoor gym

2. PRE – AUDIT PHASE

A pre-audit meeting is a prerequisite for the Audit; it helps to meet and discuss about the schedule and documents required during the audit. The pre-audit meeting was conducted online. During the meeting, introduction of team members, scope and objectives of the audit were discussed.

Management Commitment

The Management of the college has shown significant commitment towards Quality Auditing during the pre-audit meeting. They were ready to encourage all green activities. It is decided to promote all activities that are environment friendly such as awareness programmes on the environment, campus farming, planting more trees on the campus etc., after the Quality Auditing.

College administration is vital to the process of realizing campus sustainability, and college policy is an essential instrument for any substantial change in the campus environment.

Scope and goals of Quality Auditing

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues. Quality Auditing is one among them for educational institutions.

Once a baseline is established, the data can serve as a point of departure for further action in campus greening. Existing data will allow the college to compare its programs and operations with those of peer institutions, identify areas in need of improvement, and prioritize the implementation of future projects.

This data will also provide a basis for calculating the economic benefits of resource conservation projects by establishing the current rates of resource use and their associated costs. This audit initiative focused initially on educating colleges and universities through workshops, guidebooks, fact sheets and ensuring compliance through inspections and self-audits.

3. AUDIT METHODOLOGY AND APPROACH

The methodology and approach adopted for the study involve various steps that include:

- Review of Document and records
- Review of Policies
- Review of MoU
- Review of various measures implemented
- Site Walkthrough
- Data Collection
- Interviews

3.1.1. Review of Document and Records

Electricity bills, equipment register, list of appliances, office registers, internal quality audit document, purchase document, were reviewed and relevant data and inputs required for analysis have been collected.

3.1.2. Review of Policies

College has various policies that include safety policy and Anti-ragging policy.

A. Safety Policy:

An organization's safety policy is a recognized, written statement of its commitment to protect the health and safety of the students and employees, as well as the surrounding community.

All the students, teaching and non-teaching staff, maintenance and house-keeping staff have been given training to use fire extinguishers in emergency situations of fire and explosion. Fire extinguishing cylinders have been installed in each floor and in laboratory areas. The fire extinguishers are shown in figure 3.1.



Figure 3-1: Fire Extinguisher installed in the floors

B. Anti-Ragging

Anti-Ragging Committee will be the supervisory and advisory committee in preserving a culture of Ragging Free Environment in the college campus. 'No – Ragging' poster is shown in figure

The sample image of Anti-ragging poster is shown in figure 3-2.



Figure 3-2: Anti-ragging poster

3.1.3. Review of various measures implemented

During the Quality Audit study, it was observed the college has taken various initiatives in conserving natural resources that include:

- Day light integration in class rooms, staff rooms, hostels and common areas
- Use of LED lights for interior (class rooms, office rooms, hostels, common areas, etc.) and external applications (street lights)
- Grid tied Solar Roof Top Photo Voltaic (SRTPV) system for power generation
- Use of energy efficient air conditioning systems such as VRV and inverter AC units
- Use of Solar water heaters and heat pumps for hot water generation
- Use of LED/ LCD monitors
- Use of sign boards and posters for awareness creation
- Installation of Sewage Treatment Plant for waste water treatment and reuse
- Installation of low flow taps
- Installation of borewell type ground water recharge pits
- Installation of Rain water harvesting systems
- Regular testing of water quality
- Installation of Dust bins
- MoU for E-Waste management
- Regular cleaning of campus
- Campaign on Plastic free campus
- Green landscaping
- Organic manure for plants
- Regular maintenance of greeneries

3.1.4. Site Walk through

Site walk through was conducted with staff members and audit team members. They have shown very keen interest in the data collection process and methods to be followed in field data collection. The staffs have given inputs and suggestions for resource conservation as well.

College Infrastructure

College campus has various blocks and departments. Each floor has state of the art class rooms, staff rooms, laboratories libraries and many more. Details of infrastructure are as follows:

- Sports and Games
- Basketball Court
- Volleyball Court
- Play Ground

- Cafeteria
- Auditorium
- Smart Class room
- Seminar Halls
- Conference Rooms
- Meeting Room
- Transport
- Hostel
- 24/7 Security
- Library
- Staff Room

All the classrooms and staff rooms are well ventilated and the integration of day-light is well utilized. This has helped in optimized usage of electricity for lights and fans during day time.

3.1.5. Interviews

To collect the various data, information and operating patterns, interviews were conducted with college staff (Principal, teaching staff, non-teaching staff) and students. The consolidated information from the interviews is given in the following sub-sections.

4. ENERGY AUDIT

4.1. Facility Description

Global Academy of Technology, Bengaluru receives power supply from the state electricity board (BESCOM – Mangalore Electricity Supply Company Limited) at HT 11 kV. The 11kV rated HT power supply is stepped down to LT 433V, by one number of 400 kVA rated transformer. The college has availed power supply, with connection – RR. No S9HT25 with HT-2(C)-(ii) tariff. Transformer unit installed in hostel premises is as shown in the figure 4-1.



Figure 4-1: Transformer Yard

The name plate details of transformer are given in table 4-1.

S. No.	Description	Units	Details
1	Rated Capacity	kVA	400
2	Rated Voltage Prim/Sec	kV	11/0.433
3	Rated Current Prim/Sec	A	20.9/533.3
4	Type of Cooling	-	ONAN
5	Frequency	Hz	50
6	Impedance	-	4.5%
7	Phase	-	3

Table 4-1: Name plate details of transformer

The LT supply from the transformer is taken to the main distribution panel located inside the Electrical panel room via power cables.

Power supply cables from the electrical panel room is distributed to the various distribution panels placed inside the campus. From the main electrical LT panel room, power supply is catered to individual areas. Electrical panel room is as shown in the figure 4-2.



Figure 4-2: Electrical Panel room

DG Sets:

Three numbers of DG (Diesel Generator) sets have been installed for backup power supply, during power failure from BESCO. One number of DG set is installed and college, and the other two number of DG sets are installed in hostel premises. The DG sets are operated in manual mode. DG sets installed at the college premises is shown in the figure 4-3.

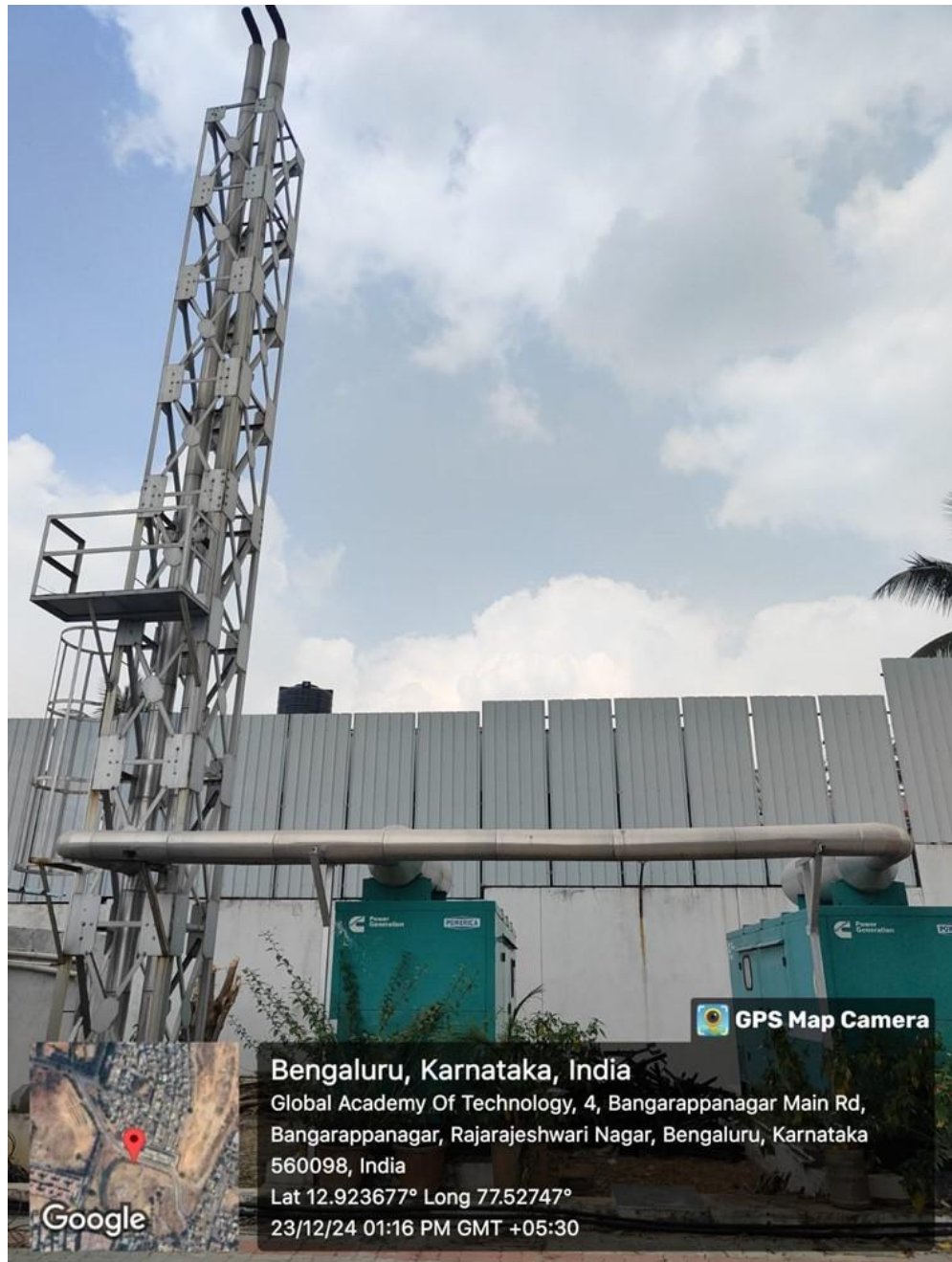


Figure 4-3: Diesel Generator (DG) sets

The name plate details of the DG sets are shown in the table 4-2.

S. No	Description	Unit	DG #1	DG #2	DG #3
1	Rated Capacity	kVA	200	200	200
2	Rated Capacity	kW	160	160	160
3	AC Volt	V	415	415	415
4	Power Factor		0.8	0.8	0.8
5	Phase		3	3	3
6	Ambient	°C	40	40	40
7	Frequency	Hz	50	50	50
8	RPM		1500	1500	1500

Table 4-2: DG Set -Specifications

4.1.1. Tariff Structure

The sanctioned contract demand of the campus is 70 kVA at specified voltage of 11 kV. Electricity supply from BESCO is billed under HT-2(C)-(ii) schedule of tariffs. The tariff includes demand charges of Rs. 240 per kVA, and energy charges of Rs.7.2 per kWh.

The kVA demand charges @ Rs. 240/kVA of maximum demand recorded during the month or 85% of the contract demand, whichever is higher

4.1.2. Electricity Consumption Data

Details of electricity consumption for 2023-24 have been collected and Salient features of electrical energy details are given in table 4-3.

S. No.	Description	Unit	Details
1	Contract Demand	kVA	350
2	Demand Charges	Rs./kVA	240
3	Maximum Demand Recorded for 2023-24	kVA	130
4	Average Monthly Energy Consumption during 2023-24	kWh	20000
5	Average System Power Factor		0.88
6	Average Energy Charges considered for savings calculations	Rs./ kWh	7.2

Table 4-3: Electricity Bill Parameters for year 2023-24

Details of sample electricity bill for 2024-25 is in given in figure 4-4.

CAT - COLLEGE


		Bangalore Electricity Supply Company Limited (Wholly Owned Government of Karnataka Undertaking)				
BESCOM GSTN No: 29AACCB1412G1Z5						
Office of the Asst. Executive Engineer (Ele.), C, O&M Sub-division - W7						
RAJARAJESHWARINAGARA						
RR No.	Account ID	Bill No.	Billing Period	Bill Date	Due Date	Disconnection Date
5450533350 (SRTPVSSHT25)	5450533000	545457411836	01-03-2026 - 01-04-2026	01-04-2026	15-04-2026	01-05-2026
Name & Address:		Type	Educational Institutions - HT2C	Wheeling Energy	0	
NATIONAL EDUCATION FOUNDATION (SRTPV) (ECS) EDUCATIONAL INSTITUTION (SRTPV)PVT RRNAGAR, KAR -560098		Tariff	1HT2C2	High Cost Energy		
		Contract Demand(KVA)	170	Special Energy		
		90% of CD (KVA)	153	Base Consumption		
		Recorded Demand (KVA)	194	Power Cut		
		Billing Demand (KVA)	194	Energy Entitlement Demand		
				Entitlement		
Meter Readings for Meter ID 594815310						
Description	Date	KWH Meter	KVAH Meter	MD meter	PF	
Present Reading	01-04-2026	1795.850059	1923.57956	0.1935	0.90	
Previous Reading	01-03-2026	1754	1888.85000	0.1935		
Difference		31.000059	34.729561	0.1935		
Meter Constant		1000	1000	1000		
Consumption		31059.059	34459.961	193.5		
Loss/ADD Consumption		0	0			
Net Consumption		31059	34459.961	193.5	0.90	
TOD meter readings for meter ID 594815310						
Time Zone	Name of the Zone	Present Readings	Previous Readings	Consumption	MD Reading	
06:00 Hrs to 9:00 Hrs	Morning Peak	995.27902	588.719971	406.559049	61.420002	
9:00 Hrs to 18:00 Hrs	Normal	852.450024	831.480099	20.969925	193.5	
18:00 Hrs to 22:00 Hrs	On Peak	347.390015	343.790005	3.600010	88.900002	
22:00 Hrs to 6:00 Hrs	Off Peak	0	0	0	0	
Details for NEFT/RGGS This Bill Payment Only.		Your Detailed Bill				Amount (Rs.)
Beneficiary Name : BESCOM		Description				
Account Number : 5450533000		Demand Charges: 170.00 KVA at Rs 350.00 per KVA				59,500.00
Bank Name : Bank of India		Energy Charges: 29,690.00 kWh at Rs 7.20 per kWh				213,768.00
Branch : Cantonment		Fuel Cost Adjustment Charges: 29,690.00 KWH at Rs 0.47 per KWH				13,954.30
IFSC : BKID00BSCOM		Excess Load/MD Penalty: 24.00 kVA at Rs 700.00 per kVA				16,800.00
Amount : 333950.00		Interest on Revenue				0.00
		Interest on Tax				0.00
		Tax				19239.12
		P&G Surcharge (Government Portion)				10688.40
		Current Bill Amount				333949.82
		Arrears				0.00
		Bill Correction				0.00
		Transfer P&G amt from revenue to P&G SA				7905.60
		P&G Surcharge transfer from revenue to P&G SA				-7905.60
		Bill rounding adjustment				0.18
		Net Payable Amount				333950.00
		Rupees Three Lakh Thirty-Three Thousand Nine Hundred Fifty Only				
		Sd/- Assistant Executive Engineer (Ele.)				

Figure 4-4: Sample Electricity Bill for 2024-25

4.1.3. SRTPV (Solar Roof Top Photo Voltaic) system

SRTPV (Solar Roof Top Photo Voltaic) system was installed at the roof top of the building.

The capacity of SRTPV installed is of **150 kW_p** rated. Three numbers of solar inverter of 50 kW capacity each is installed.

The SRTPV is on-grid system type. During the audit, photo of SRTPV systems are collected and is shown in figure 4-4.

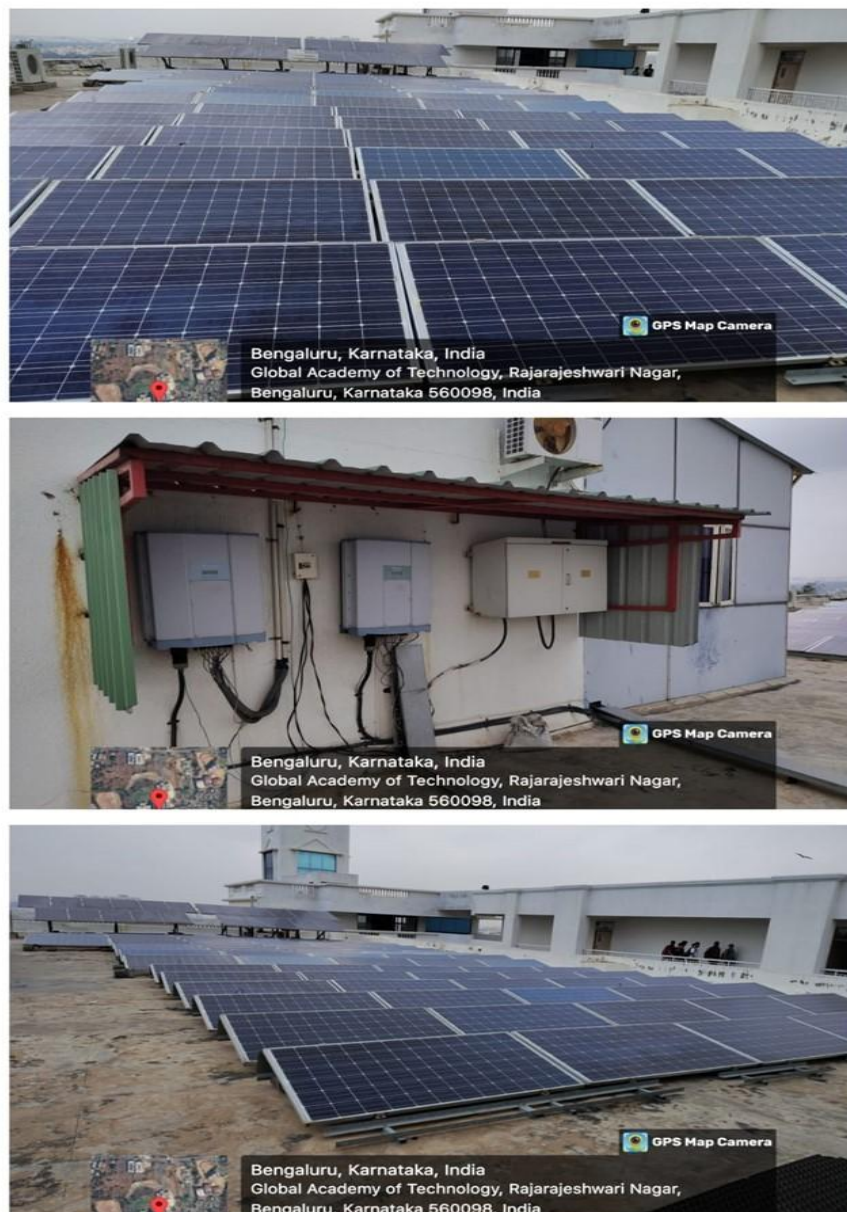


Figure 4-5: Solar Roof Top PV system

4.2. Institutional Initiatives for Energy Conservation

During the study, observations were carried out on the usage of the inventories in the college building premises. In the intension of saving the electricity, various measures have been adopted in the college. Computers and AC units are used only during the working hours, after completion of class hours – fans, lights, computers and AC units are found to be turned OFF. This practice is followed across the college premises (class rooms, labs, staff rooms, office rooms, library and auditoriums).

4.2.1. Day-light Integration

During the audit phase classrooms, Staff-rooms, computer lab, UPS & batteries room and library areas were surveyed for illumination levels and fresh air-circulation. It was observed most of the rooms are well ventilated and day-light integrated; sample photos are shown in figure 4-5.

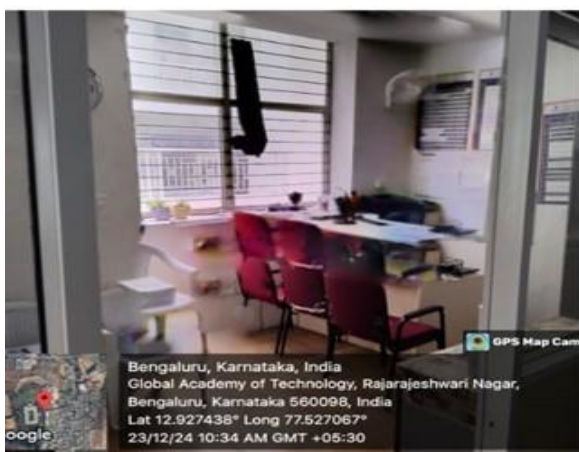
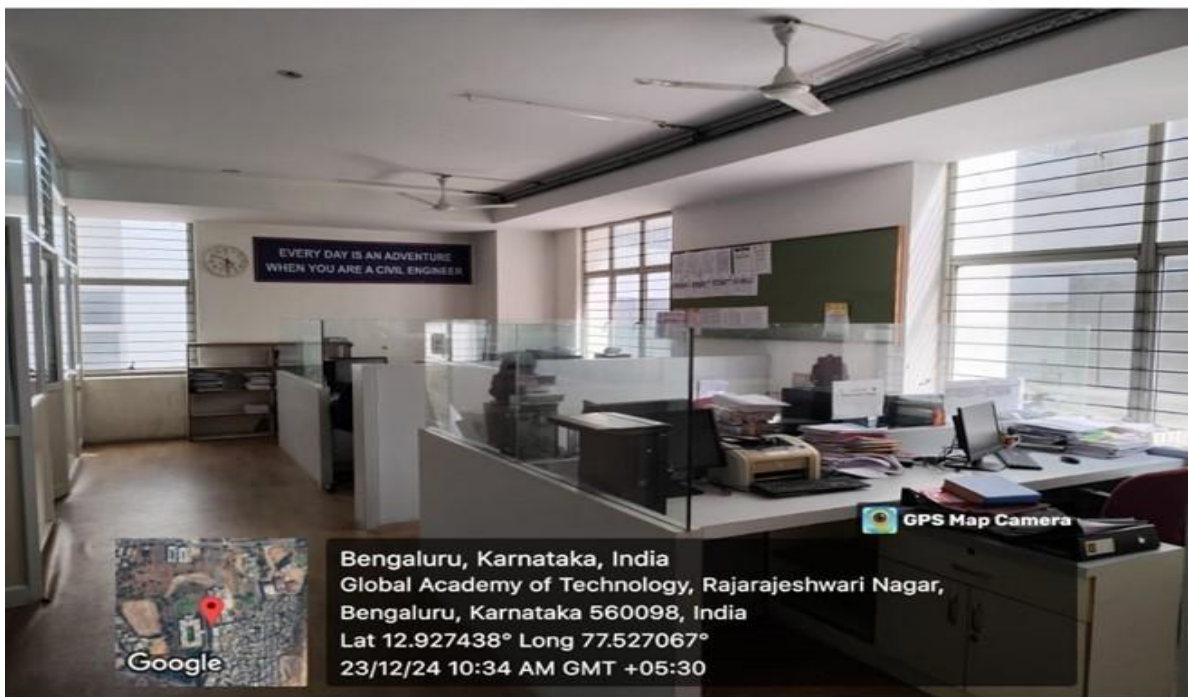


Figure 4-6: Well-ventilated and day-light integrated class room and Library

4.2.2. Installation of LED lights

In the campus, LED fixtures are used to conserve energy. LED fixtures are used in the class rooms, staff-rooms, seminar hall corridors, hostel, dining area, etc. Sample photo of LED lamp used in the some of the locations of the college area are shown in figure 5-8 and sample LED purchase bill is shown in figure 4-6.

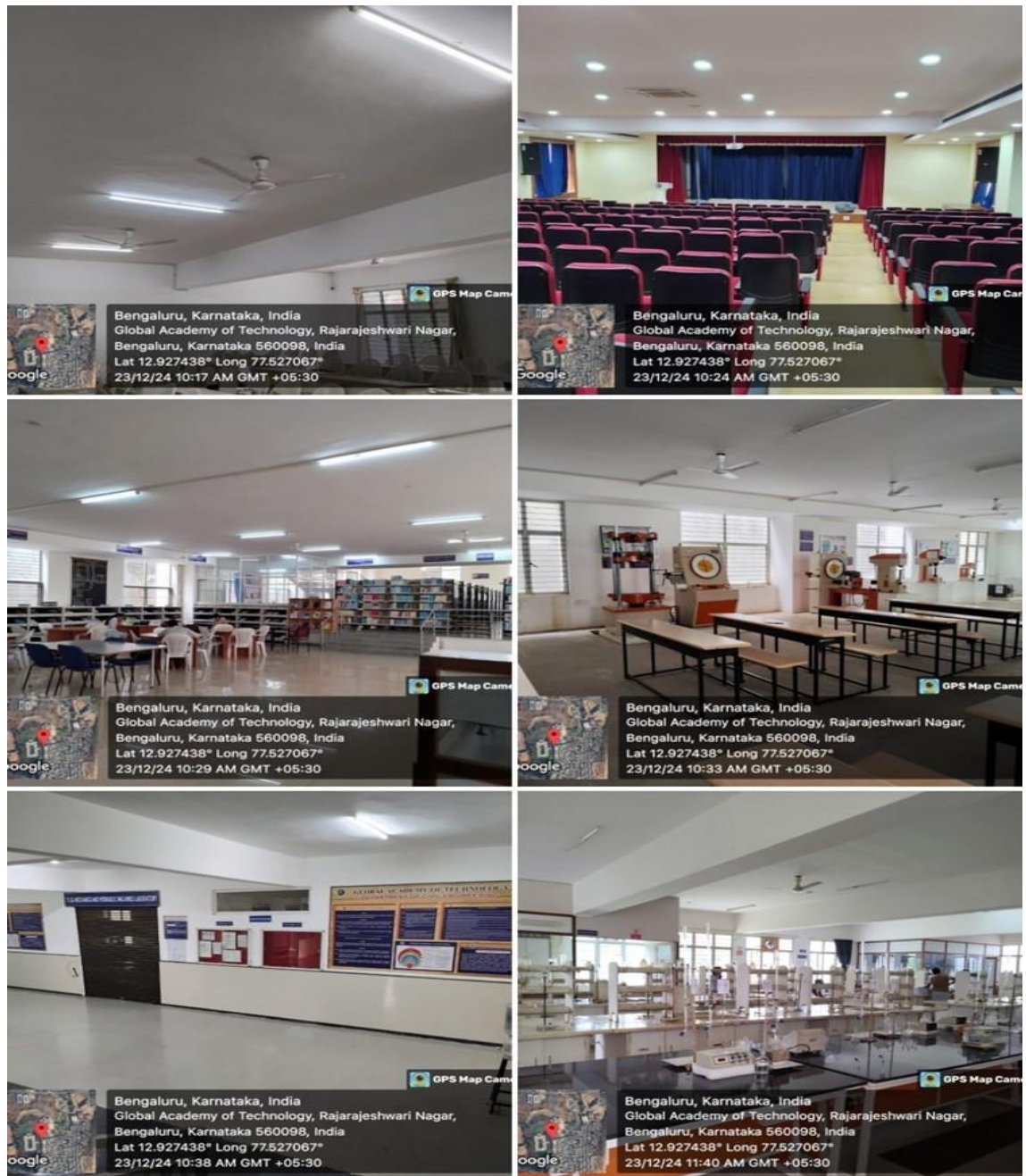


Figure 4-7: LED lights installed in Campus

4.2.3. Installation of SRTPV system

SRTPV (Solar Roof Top Photo Voltaic) system was installed at the terrace.

The capacity of SRTPV installed is of **150 kWp** rated. The SRTPV is on-grid system type. During the audit, photo of SRTPV systems is collected and is shown in figure 4-7.



Figure 4-8: SRTPV installed at college

Energy generation and cost savings of 150 kWp is estimated and the same is given in the table 4-4

S. No.	Description	Unit	Savings for 23-24	Savings for 24-25	Total Savings
1	Rated Capacity of SRTPV system	kWp	150	150	150
2	Average units generated per day	kWh/day/kWp	3.5	3.5	3.5
3	No. of working hours per annum	days	350	350	350
4	Annual energy generation from SRTPV	kWh/ annum	183750	183750	367500
5	Average energy cost	Rs./kWh	9.5	9.5	9.5
6	Annual cost savings due to installation of SRTPV	Rs. Lakh / annum	17.5	17.5	35
7	CO2 mitigations per year	Tons/year	145.2	145.2	290.4

Table 4-4: Cost savings from SRTPV system

Note: The Energy Generated and Grid Electricity cost for 24-25 is assumed to be same as previous year 23-24.

4.2.4. Installation of Solar Water Heater

Solar water heaters are installed in boy's hostel for generating hot water. It is integrated with heat pump system. Sample photo of solar water heater used in the campus are shown in figure 4-8.

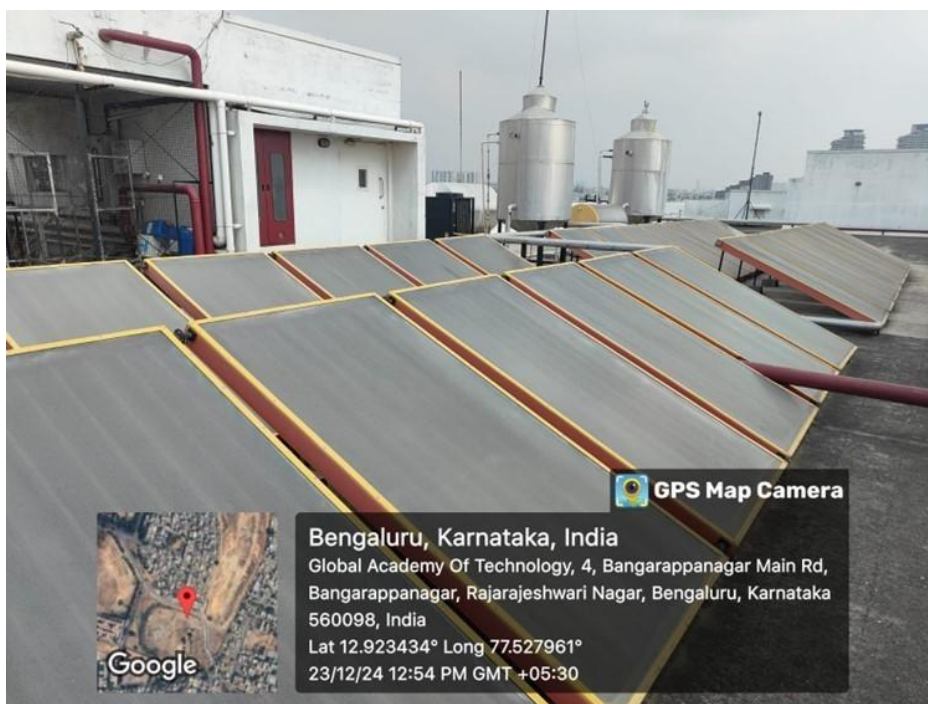


Figure 4-9: Use of Solar Water Heater

The cost savings by installation of solar water heater are given in table 4-5.

S. No.	Description	Unit	Savings for 23-24	Savings for 24-25	Total Savings
1	Solar water heater installed	L	20000	20000	20000
2	Total amount of heat produced	kCal/hr	600000	600000	600000
3	Electricity equivalent	kWh	697.7	697.7	1395.4
4	No. of working days per year	days	250	250	500
5	Annual electricity savings	kWh	174418.6	174418.6	348837.2
6	Average electricity cost	Rs./kWh	9.5	9.5	9.5
7	Annual cost savings achieved per year	Rs. lakh/year	16.6	16.6	33.2
8	CO2 mitigations per year	Tons/year	137.8	137.8	275.6

Table 4-5: Annual cost savings by installation of Solar Water Heater

Note: The cost savings by installation of solar water heater for 24-25 is assumed to be same as previous year 23-24.

4.2.5. Installation of Heat Pump

Heat pump technology has been used for the hot water availability in Boy's hostel and is integrated with the solar water heater. The integrated hot water system is shown in figure 4-9.

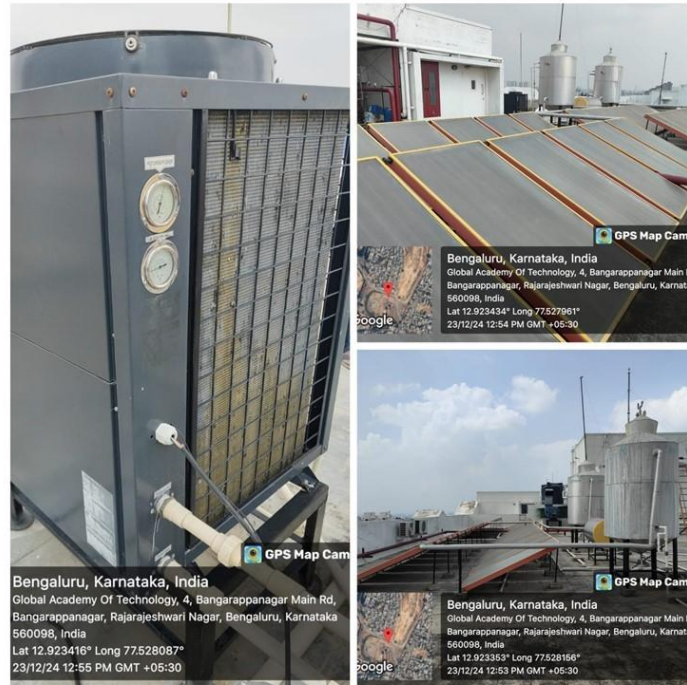


Figure 4-10: Integrated recirculation type -Hot water system

Annual energy savings by heat pump technology is as shown in table 4-6.

S. No.	Description	Unit	Savings for 23-24	Savings for 24-25	Total Savings
1	Heat Pump Capacity	L	10000	10000	10000
2	Total amount of heat produced	kCal/hr	300000	300000	300000
3	Electricity equivalent	kW	349	349	349
4	Input Power required for heat pump	kW	116	116	116
5	Difference in electrical power	kW	233	233	233
6	Energy savings per heat pump per day	kWh	233	233	233
7	Total number of heat pumps installed	no.	2	2	2
8	Total energy savings from 2 numbers of heat pumps	kWh	465	465	465
9	No. of working days per year	days	300	300	600
10	Annual electricity savings	kWh	139535	139535	279070
11	Average electricity cost	Rs./kWh	10	10	10
12	Annual cost savings achieved per year	Rs. lakh/year	13	13	26
13	CO2 mitigations per year	Tons/year	110	110	220

Table 4-6: Cost savings from SRTPV system

Note: The Annual energy savings by heat pump for 24-25 is assumed to be same as previous year 23-24.

4.2.6. Installation of UPS for power backup

UPS (Un-interrupted Power Supply) system is installed in the college premises for power backup. 120 kVA rated capacity UPS have been installed to provide backup power supply, during power failure from grid. The picture of UPS and battery installed in the college is shown in figure 4-10.

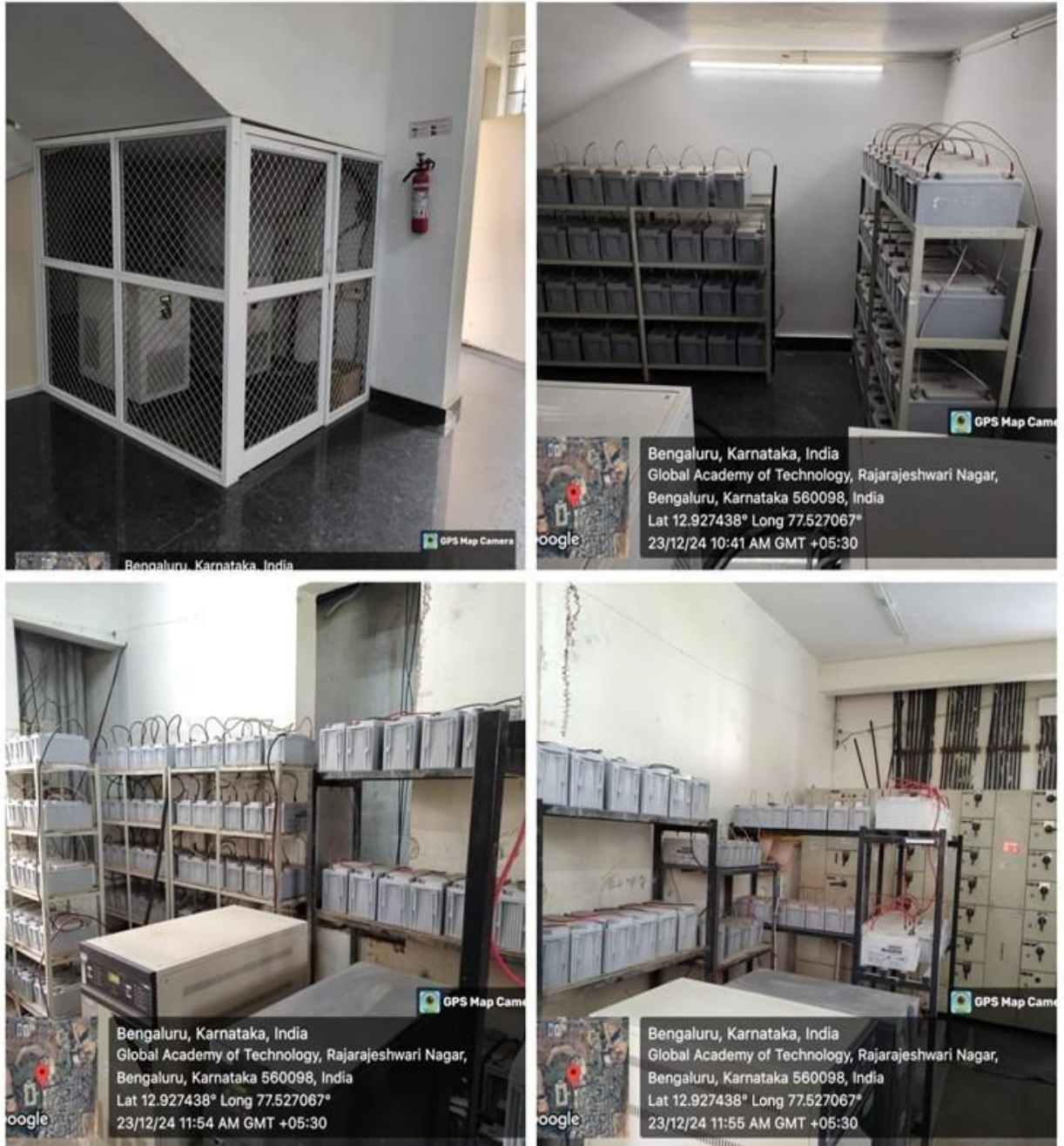


Figure 4-11: UPS and batteries

4.2.7. Use of Electrical Safety Mats

Electrical safety mats were used placed near each electrical panel to avoid electrical shock risk. The image of the electrical safety mats used is shown in figure 4-11.



Figure 4-12: Electrical safety mats near electrical panel

4.2.8. Usage of Electrical Risk Awareness Sign boards

There were electrical shock and first aid awareness posters at electrical panel room. Sample picture taken during walk through is shown in the figure 4-12.

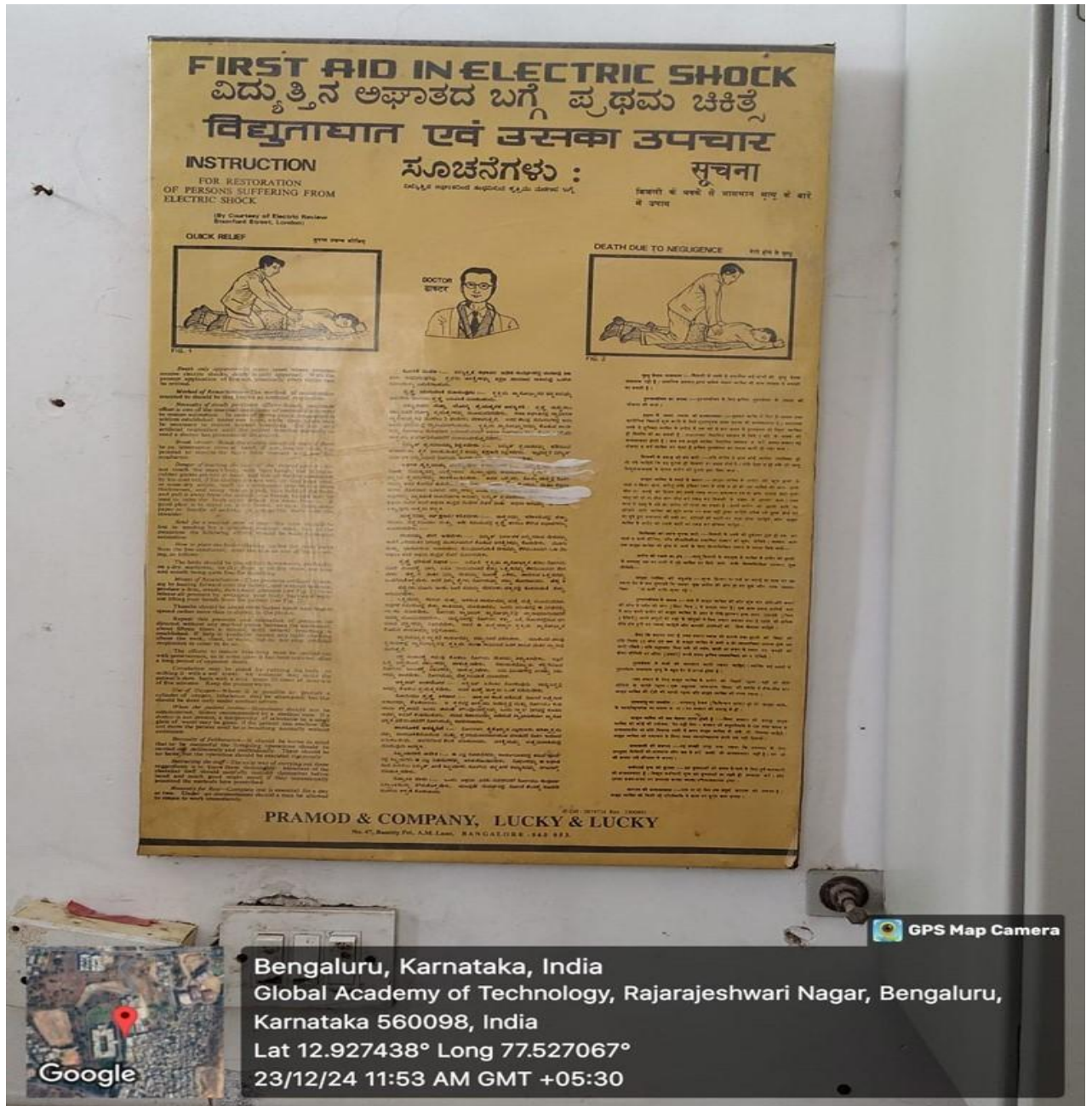


Figure 4-13: Electrical risk awareness sign boards

4.2.9. Automatic Rescue Device for Lifts

Automatic Rescue Device (ARD) is a device installed for an elevator which is only used in case of a power failure in a building. An ARD is extremely useful for preventing passengers from becoming trapped inside an Elevator during a power failure. ARD is installed for the lifts in college premises. The image of lift at college is shown in figure 4-13.



Figure 4-14: Lift with ARD

4.2.10. Installation of Lightning Arrester

Lightning Arrestors were installed at terrace of college building. When potentially dangerous lightning strikes, the arrester activates and diverts the lightning to the ground, where it will disperse harmlessly.

The image of lightning arrester installed at terrace is shown in figure 4-14.



Figure 4-15: Lightning arresters in the college terrace

4.2.11. Procurement of LED/LCD monitors

LED/LCD monitors are used for all the desktop computers in staff rooms and in computer labs. Sample photos of the computer labs are as shown in the figure 4-15.

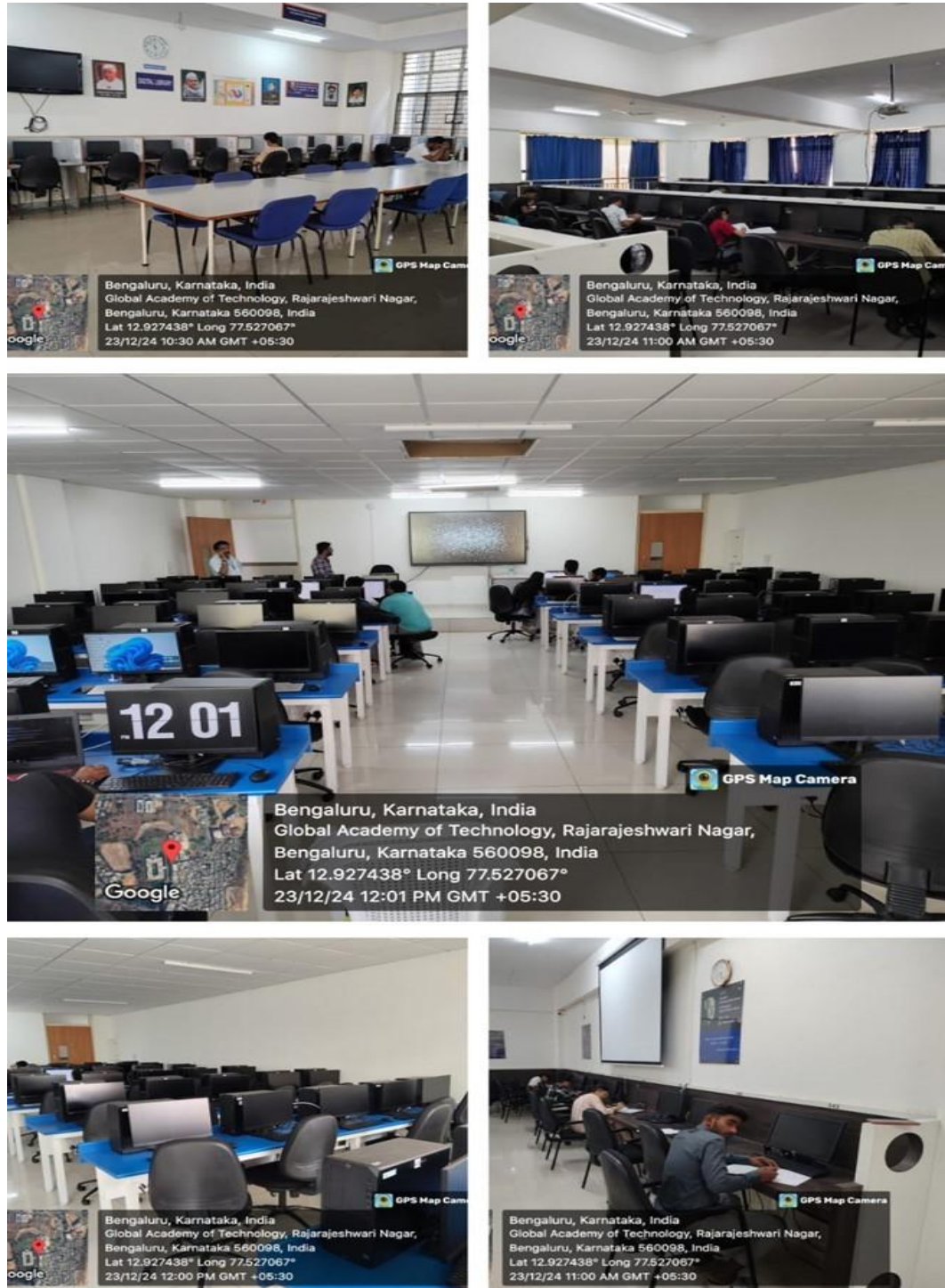


Figure 4-16: Use of LED monitors in the computer labs

4.2.12. Installation of Digital LED Display

Management have installed digital panels to reduce the marketing waste such as banners and flexes. Sample photo of Digital LED display used in the college are shown in figure 4-16.



Figure 4-17: Digital LED Display

4.2.13. Installation of VRV and Inverter AC Systems

The conventional air-cooled AC units are replaced with energy efficient VRV and Inverter type AC units.

The VRV type energy efficient Air conditioning system specification details are shown in figure 5-13.

The cost savings by installation of energy efficient VRV AC Units are given in table 4-7.

S. No.	Description	Unit	Savings for 23-24	Savings for 24-25	Total Savings
1	Rated Tonnage of AC units installed	TR	300	300	300
2	SEC of VRV AC units	kW/TR	1	1	1
3	SEC of Conventional air-cooled AC units	kW/TR	1.5	1.5	1.5
4	Difference in SEC	kW/TR	0.5	0.5	0.5
5	Savings due to installation of VRV AC units	kW	100	100	100
6	Realizable savings @60%	kW	80	80	80
7	Working hours per day	hours	12	12	12
8	No. of working days per year	days	350	350	700
9	Annual electricity savings	kWh	336000	336000	672000
10	Average electricity cost	Rs./kWh	8	8	16
11	Annual cost savings achieved per year	Rs. lakh/year	26.9	26.9	53.8
12	CO2 mitigations per year	Tons/year	265.4	265.4	530.8

Table 4-7: Annual cost savings by installation of VRV AC units

Note: The cost savings by installation of energy efficient VRV AC Units for 24-25 is assumed to be same as previous year 23-24.