REPORT OF ENVIRONMENT, GREEN AND ENERGY AUDIT

of

Excel Engineering College

(Autonomous)

Komarapalayam, Namakkal

EXECUTED BY

DEPARTMENT OF MECHANICAL ENGINEERING
&
ELECTRICAL AND ELECTRONICS ENGINEERING

INDUSTRY- INSTITUTE PARTNERSHIP CELL

CENTRE OF EXCELLENCE IN ENERGY STUDIES

KONGU ENGINEERING COLLEGE

PERUNDURAI
ERODE – 638 060
TAMILNADU

Estd : 1984

Transform Yourself

October 2023

Acknowledgement

The Environmental, Green and Energy Audit was conducted on 30th October, 2023 by the audit team members from Kongu Engineering College. The Industry Institute Partnership Cell (IIPC) of Kongu Engineering College is thankful to the Management of Excel Engineering College for providing an opportunity to conduct the audit inside their college premises. The IIPC expresses its sincere gratitude to the Principal, faculty members and other staff members of the college for their support in carrying out the audit.

The audit was carried out by qualified and experienced Energy Professionals/Engineers from Kongu Engineering College. The audit team includes the following members.

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1. EXECUTIVE SUMMARY

Excel Engineering College had agreed to provide access to Kongu Engineering College to undertake Environmental/Green and Energy Audit related measurements at their campus. This Audit has been conducted by a team of faculty members from Mechanical and Electrical Engineering Department of Kongu Engineering College. As there is no standard model for such an audit, the committee brainstormed and evolved a questionnaire. The data was collected, compiled and was finally analysed by the audit team members. The remaining data which involved measurement using sophisticated instruments were done by the audit team members. By and large, the audit reveals a healthy environment in the campus. The committee has made short term and long-term suggestions to protect environment at higher levels and it is hoped that this will receive due attention of authorities and all stakeholders of the College.

2. OBJECTIVES OF THE AUDIT STUDY

The goals of the present environmental/green and energy audits typically include:

- To recognize, diagnose and resolve the environmental problems.
- To recognize the effects of an organization on the environment and vice versa.
- To identify and control the impact of activities of organizations on environment.
- To suggest the best protocols for sustainable development of organization and environment.
- To assess environmental performance and the effectiveness of the measures to achieve the defined objectives and targets.
- To identify the different pressures on organization to improve their environmental performance.
- To ensure that the natural resources are utilized properly as per national policy of environment.
- To establish the parameters for maintaining health and welfare of the community of the organization.
- To set the procedure for disposal of all types of harmful wastes.
- To reduce energy consumption.

- To give preference to the most energy efficient and environmentally sound appliances.
- To minimize the consumption of water and monitor its quality.
- To identify the risks of hazards and implement the policies for safety of stakeholders.
- To facilitate the stakeholders with different aspects of disaster management.
- To train all stakeholders of the organization and empower them to contribute and participate in the environmental protection.

To achieve the mentioned objectives, following stages are implemented. It includes three stages viz. pre-audit stage, audit stage and post-audit stage. Each of these stages comprises a number of clearly defined objectives, with each objective to be achieved through specific actions and these actions yielding results in the form of outputs at the end of each stage.

3. INTRODUCTION TO ENVIRONMENTAL/GREEN AUDIT

The various activities carried out in the academic institutions affects the environment in which it is situated. To address the issues, the institutions can successfully use auditing strategies to monitor their environmental-energy related activities. An "environmental audit" is a "systematic, documented, periodic and objective review to meet environmental requirements". Although environmental audits may be performed in many ways for different purposes, the reasons for performing an audit and the goals to be achieved will determine the type of environmental audit to be performed. Green audit is the tool of management system used methodologically for protection and conservation of the environment. It is also used for the sustenance of the environment. The audit suggests different standard parameters, methods and projects for environmental protection. The green audit is useful to detect and monitor sources of environment pollution and it emphasizes on management of all types of wastes, monitoring of energy consumption, monitoring of quality and quantity of water, monitoring of hazards, safety of stakeholders and even the management of disasters.

Excel Engineering College (EEC) imparts futuristic technical education with a humane touch through dedicated faculty, so that the students become trendsetting engineers of the modern era and responsible citizens of the nation. The management of EEC is concerned about the needs of the nation as well as the world with the help of niche technologies. The Institution offers 14 Under Graduate and 13 Post Graduate programs. Holistic teaching, well equipped class rooms, User friendly laboratories with air conditioners, High profile placement records and well established Central library are the highlights of the institution.

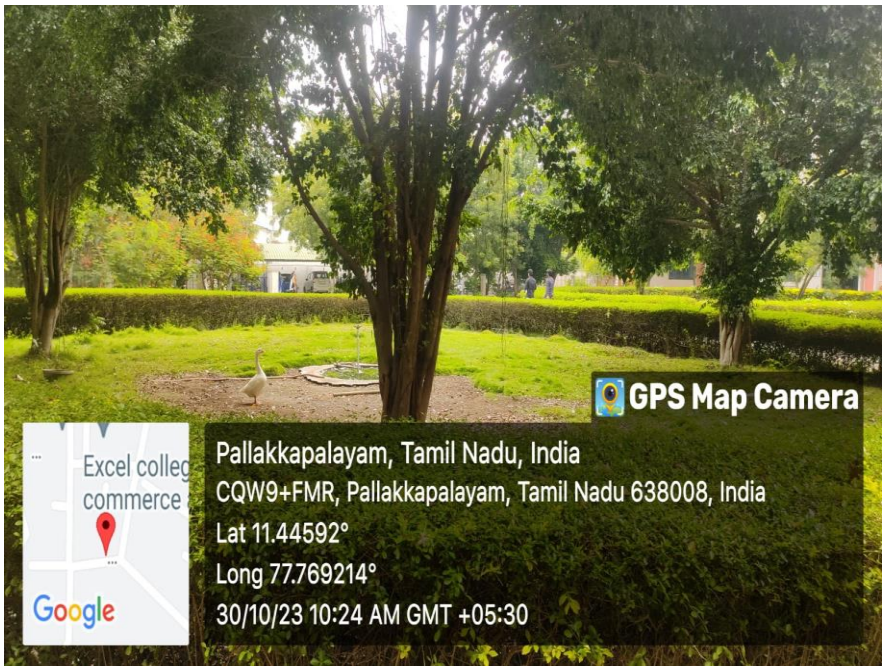

Figure 1. Green campus

3.1 WATER MANAGEMENT

Three bore-wells inside the campus cater the total requirement of the college through water tanks of different capacities. The College has its own RO plant with a generation capacity of 8000 litres per day. The grey water coming out of RO plant is reused for gardening purposes. Recharging of ground water and rainwater harvesting are implemented by the college thereby conserving the water from its inception. This recharging and harvesting has been very helpful to augment the ground water. The college buys water from the corporation for feeding the raw water to the RO system. 13 number of

pumps are used for pumping water in the college and hostel. Each pump works approximately for 4 hours a day. Water metering is done for raw water as well as RO water.

Figure 2. Open Well

3.2 SOLID WASTE MANAGEMENT

The campus is cleaned on daily basis. Waste bins are placed in corridors, office and staff rooms. The waste generated in the campus includes wrappers, glass, metals, paper, etc. Old newspapers, used papers and journal files, workshop scrap etc. are given for recycling to external agencies. Glass, metals and other non-biodegradable wastes are given to external agencies where they are segregated and disposed/ recycled according to the nature of the waste. Non-biodegradable and plastic wastes are disposed by municipal collection centre. Leaf litter is allowed to decompose systematically over a period of time and used as manure for the gardens in the institute. In the hostel approximately 5 kg of food waste is generated per day which is given outside for domestic animals.

3.3 LIQUID WASTE MANAGEMENT

Sewage, Laboratory, hostel and canteen effluent waste are the major liquid waste. Effective drainage system is found in all buildings for managing sewages. The laboratory waste water does not contain hazardous chemicals and periodical monitoring is done by the maintenance team. The college will be strict on the source reduction of chemical waste. Laboratories are purchasing chemicals for particular purposes and share surplus chemicals with other laboratories inside the campus. A sewage treatment plant is functioning within the college premises. The capacity of the tank is 8,00,000 litres. The normal running hours of the pump motor is 2 hours.

Figure 3. Sewage Treatment Plant

3.4 E WASTE MANAGEMENT

Electronic goods are put to optimum use; the minor repairs are set right by the Laboratory assistants and teaching staff; and the major repairs are handled by the Technical Assistant and are reused. UPS Batteries are recharged / repaired / exchanged by the suppliers. The waste compact discs and other disposable non-hazardous items are used by students for decoration during college fests as a creative means of showcasing the waste management practice that has been induced in the minds of the students.

3.5 GREEN COVER

The college is occupied with nearly 380 matured trees. Such a green cover helps in reducing the CO_2 levels in and around the vicinity of the campus.

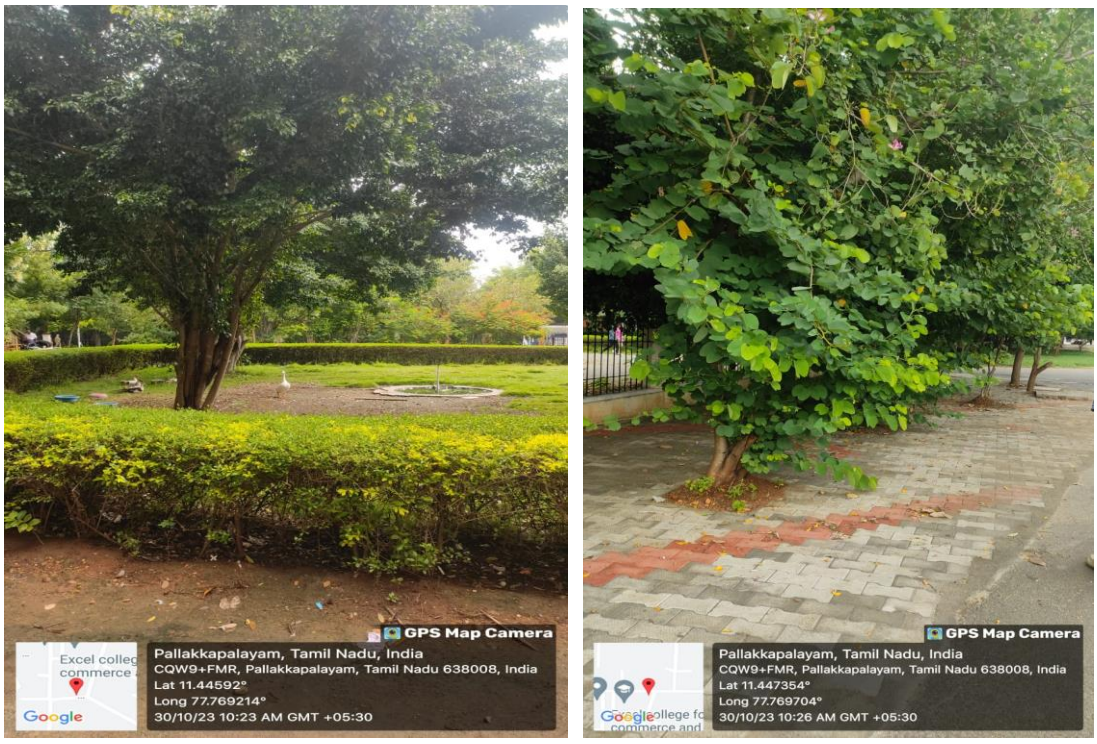

Figure 4. Green Campus

Trees and plants placed near the buildings provide shade and fresh air supply to the occupants. This also helps in reducing the heat island effect. Approximately 200 m^2 of area is occupied by green cover.

3.6 TRANSPORTATION

83 buses are operated by the institution for commuting students and staff. Nearly 50% of the students are using college buses and this helps in reducing the CO_2 emissions associated with the fuel usage due to individual vehicles. Also, roofed parking facility is available in the campus for those coming in their own vehicles.

Figure 5. Roofed Parking for two and four wheelers

The institute encourages students to use bicycle within the campus. A battery operated vehicle and an electric car available in the campus indicate the institution's commitment towards sustainable transportation. Vehicle tracking facility is available in the buses.

3.7 BASIC AMENITIES

The basic amenities are present inside the campus itself. ATM, cafeteria, gym, beauty parlour and photocopying facility are available for the use of students and staffs. Also ramp and lift facility are available in building for physically challenged students.

Figure 6. Electric Vehicle for Internal Transport, Pedestrian path

3.8 GREEN EDUCATION

Events related to green practices are organized frequently through students' associations. Institute has introduced environmental education related courses in its curriculum. Some of the courses are listed below:

DEPT	COURSE CODE	COURSE NAME
AERO	20MC201	Environmental Sciences
	20AEA01	Wind Turbine Design and Testing
AGRI	20AG304	Soil Science and Engineering
	20AG501	Farm structures and Green house Technology
	20AG504	Hydrology , Soil and Water Conservation Engineering
	20AG602	Irrigation and Drainage Engineering
	20AG604	Renewable Resource Technology
	20AG702	groundwater and Well Engineering
	20AGE08	Agricultural Structures and Environmental Control
	20AGE22	Micro Irrigation
	20AGE23	On Farm Water Management
	20AGE24	Automation in Irrigation
	20AGE28	Water Harvesting and Soil conservation Structures
	20AGE45	Energy Auditing and Management

	20AGE46	Bio-energy systems: Design and applications
	20AGE48	Thermal Power Engineering
	20AGO01	Air Pollution and Control Engineering
	20AGO03	Introduction to Bio energy and Bio-fuels
	20AGO04	Energy Technology
	20AGO05	Green Building Design
CIVIL	20CE503	Environmental Engineering I
	20CE703	Water Resource and Irrigation Engineering
	20CEE01	Hydrology
	20CEE02	Ground Water Engineering
	20CEE04	Water Resources Systems Analysis
	20CEE05	Integrated Water Resources Management
	20CEE08	Participatory Water Resources Management
	20CEE09	Air Pollution Management
	20CEE12	Geo- Environmental Engineering
	20CEE50	Design of Energy Efficient Building
	20CEO01	Energy Conservation and Management

	20CEO03	Renewable Energy Sources
	20CEO06	Green Building Design
EEE	20PEE104	Transport of Water and Wastewater
	20PEE202	Industrial Wastewater Management
	20PEEE11	Air and Water Quality Modeling
	20PEEE12	Membrane Separation for Water and Wastewater Treatment
	20EE605	Renewable systems Laboratory
	20EEE45	Electric Energy generation , Utilization and conservation
	20EEE46	Energy management and auditing
	20EEE48	Smart Grid
	20EEE49	Power Electronics for renewable energy systems
	20EEEO01	Energy conservation and management
	20EEEO12	Renewable energy systems
	20EEEA06	Hybrid Solar PV system
	20PPEE32	Solar and Energy Storage systems
	20PPEE41	Wind Energy conversion systems
	20PPEE44	Electric vehicles

PCT	20PCA01	Energy conversion Technology

Figure 6. Courses on Environment and Energy Consciousness

4.	**INDOOR AIRQUALITY**

Indoor air quality (IAQ) refers to the quality of the air inside buildings as represented by concentrations of pollutants and thermal (temperature and relative humidity) conditions that affect the health and performance of occupants. It has become one of the most important issues of environment and health worldwide considering the principle of human rights to health that everyone has the right to breathe healthy indoor air. With the help of Indoor Air Quality meter (Extech EA80), CO_2 level, relative humidity and dry bulb temperatures can be measured. The measurements are carried out based on the protocol given by Central Pollution Control Board, Ministry of Environment and Forests, Govt. of India and the norms are discussed briefly in the subsequent sections. Indoor air quality test was carried out at different locations of the institution. Carbon dioxide levels are within the ASHRAE 55-1992 limit in the outdoor and indoor. The instrument used in the present audit was Extech Make EA80 Model of Indoor air quality meter. The range of the instrument is given below

- CO_2 range : 0 to 6,000ppm
- Temperature range : -4 to 140°F (-20 to 60°C)
- Humidity range : 10 to 95%RH

Figure 6. Indoor air quality meter

4.1 AIR QUALITY MEASUREMENTS

Standard Level of CO_2	**ASHRAE and OSHA standards: 1000 ppm**
Standard Level of Relative Humidity	**30 – 60 % (ASHRAE)**
Standard Level of Temperature	**26 - 30°C ±3°C (ASHRAE)**

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Standard Level of Relative Humidity			**30 – 60 % (ASHRAE)**		
Standard Level of Temperature			**26 - 30°C ±3°C (ASHRAE)**		
S.No.	**Location**	**CO_2 Level (ppm)**	**Relative Humidity (%)**	**Temperature (°C)**	**Comments & Recommendation**
A1-Block					
1.	Entrance	408	62.4	29.5	Within the limits
2.	System Development Lab	410	61.4	28.7	Within the limits
3.	Thiruvalluvar Seminar Hall	420	59.2	28.6	Within the limits
4.	Classroom A1-103	408	53.8	27.3	Within the limits
5.	Classroom A1-204	395	60	26.9	Within the limits
6.	Computer Centre A1-103	420	62	28.6	Within the limits
7.	Air frame Lab	428	58	27.4	Within the limits
8.	Project Lab	414	58.5	26.7	Within the limits
9.	Faculty cabin A1-201	430	59	27.3	Within the limits
Main Block					
10.	Veranda- Ground floor	392	61.4	27.5	Within the limits

11.	Computer Centre MB107	402	61.4	27.6	Within the limits
12.	Class room MB110	386	62.4	28.4	Within the limits
13.	COE Office	395	59	26.9	Within the limits
14.	Classroom MB 216	398	58.4	29.5	Within the limits
Civil Block					
15.	Veranda – Ground floor	390	58.2	26.5	Within the limits
16.	Classroom	401	57.2	27.8	Within the limits
17.	Faculty cabin	395	59.1	28.6	Within the limits
B&T Block					
18.	Electrical Laboratory	384	59.4	30.5	Within the limits
19.	1st Floor Class room	388	60.4	28.5	Within the limits

4.2 COMFORT LEVEL

Discomfort can be caused to the occupants due to

- Inadequate ventilation
- High temperature and humidity levels
- High levels of CO_2

Ventilation should be distributed effectively in spaces, and stagnant air zones should be avoided. ASHRAE recommends relative humidity levels between 30 and 60 percent for optimum comfort. Higher humidity may result in microbial growth. A consistently implemented good-housekeeping plan is essential to eliminate or reduce the microbial growth in the building.

Damp indoor environments have been associated with many serious health effects, including asthma, hypersensitivity, and sinusitis. Moisture incursion leading to dampness can result from water leaks and/or by condensation due to high humidity. Common sources of moisture in buildings include: plumbing; roof and window leaks; flooding; condensation on cold surfaces, e.g., pipe sweating; poorly-maintained drain pans; and wet foundations due to landscaping or

gutters that direct water into or under the building. Water vapor from unvented or poorly-vented kitchens, showers or steam pipes can also create conditions that promote microbial growth. Well-designed, well-constructed and well–maintained building envelopes are critical to the prevention and control of excess moisture and microbial growth by avoiding thermal bridges and preventing intrusion by liquid or vapor-phase water. Management of moisture requires proper control of temperatures and ventilation to avoid high humidity, condensation on surfaces, and excess moisture in materials.

CO_2 is a colourless, odourless, and tasteless gas. It is a product of completed carbon combustion and the by-product of biological respiration. ASHRAE states that CO_2 concentrations in acceptable outdoor air typically range from 300-500 ppm. Adverse health effects from CO_2 may occur since it is an asphyxiate gas. The CO_2 levels can be used as a rough indicator of the effectiveness of ventilation, and excessive population density in a structure. CO_2 increases in buildings with higher occupant densities, and is diluted and removed from buildings based on outdoor air ventilation rates. Therefore, examining levels of CO_2 in indoor air can reveal information regarding occupant densities and outdoor air ventilation rates. High CO_2 levels may indicate a problem with overcrowding or inadequate outdoor air ventilation rates.CO_2, a by-product of normal cell function, is removed from the body via the lungs in the exhaled air. Exposure to high levels of CO_2 can increase the amount of this gas in the blood, which is referred to as *hypercapnia* or *hypercarbia*. As the severity of hypercapnia increases, more symptoms ranging from headache to unconsciousness appear, and it can also lead to death.

The traditional means of dealing with IAQ is through ventilation with outdoor air, but this approach assumes that the outdoor air is cleaner than the indoor air. In many locations and for many contaminants, this is not the case, and insufficiently treated ventilation air can actually make IAQ worse. Poor outdoor air quality includes regionally elevated outdoor contaminant levels, as well as local sources such as motor vehicle exhaust from nearby roadways and contaminants generated by activities in adjacent buildings. Some green building programs recommend across-the-board increases in ventilation rates, but such recommendations may be counterproductive in areas with poor outdoor air quality unless accompanied by appropriate and effective increases in filtration and air cleaning.

4.3 INFERENCE

- Carbon-di-oxide levels are within the ASHRAE 55-1992 limit in the outdoor and indoor. For indoor condition, CO_2 level should be less than 1000 ppm. CO_2 levels are well within the limits in all places.
- ASHRAE recommends relative humidity levels between 30 and 60 percent for optimum comfort. The humidity is within the limit in most of the places. The buildings are well planned and natural circulation of air is felt in all places.
- The average ambient temperature in the campus is found to be 32°C.
- Tree plantation is highly promoted and it is evidenced through the presence of trees in many areas where buildings have not been constructed.
- Awareness programmes on environmental consciousness are organized and it is evidenced through the student participation in the respective activities.
- Display boards may be kept near to sewage treatment plant.
- Recording of RO water usage may be done as part of water management activity.

5.	INTRODUCTION TO ENERGY AUDIT

An energy audit is an examination of the total energy used in a particular building or industry. The analysis is designed to provide a relatively quick and simple method of determining not only how much energy is being consumed but where and when. The energy audit will identify deficiencies in operating procedures and in physical facilities. Once these deficiencies have been identified, it will be apparent where to concentrate efforts in order to save energy. The energy audit is the beginning of and the basis for an effective energy-management programme. Human settlements encompass a variety of buildings. Regardless of the building involved, the audit procedure is basically the same. No two buildings are identical regarding energy usage. This is due to the possible variables affecting the buildings, e.g., occupancy rates, the building's size and orientation, its geographic location, the type of heating and cooling systems, the amount and types of equipment in use, the type of construction, the level of insulation and so on. Because each building is unique, it is difficult to generalize about energy-consumption patterns, and so it is necessary to conduct an energy audit for each building. Most buildings were probably designed, built and equipped when cheap energy was readily available. Little attention was paid to energy efficiency. Consequently, there is a great potential for improving operating costs of existing buildings.

6. LIQUID AND GASEOUS FUEL CONSUMPTION

LPG cylinders are used in the college hostel. Diesel and Petrol are being used for vehicles and generator. The number of bikes and cars used per day are 150 and 10 respectively. There are 85 number of college buses. The LPG cylinder (19.2 kg) is used at the rate of 1 per day.

S.No	Purpose	Fuel	Usage in Nos.	Capacity/Specification	Usage period
1.	Hostel	LPG	2080	19.2 kg	1 year
2.	College Vehicles	Petrol and Diesel	68,000 litres	54000 litres during previous year	1 year
3.	Generator	Diesel	35 lit for 9 hrs	30K – 4KFWN105, Kirloskar	1 month

7. ACTUAL MEASUREMENTS IN ELECTRICAL SYSTEM

The electrical energy consumption was verified using electricity bills. The measurements were undertaken using *CA 8332* Power Quality Analyzer at the incomer side. The following relevant electrical parameters were recorded by the above instrument with the set recording sample time of 5 seconds. In addition additional measurements were undertaken at the downstream feeders.

At each downstream feeder, the measurements were carried out for a period of 10-15 minutes to take care of different loading situations.

The following parameters were recorded.

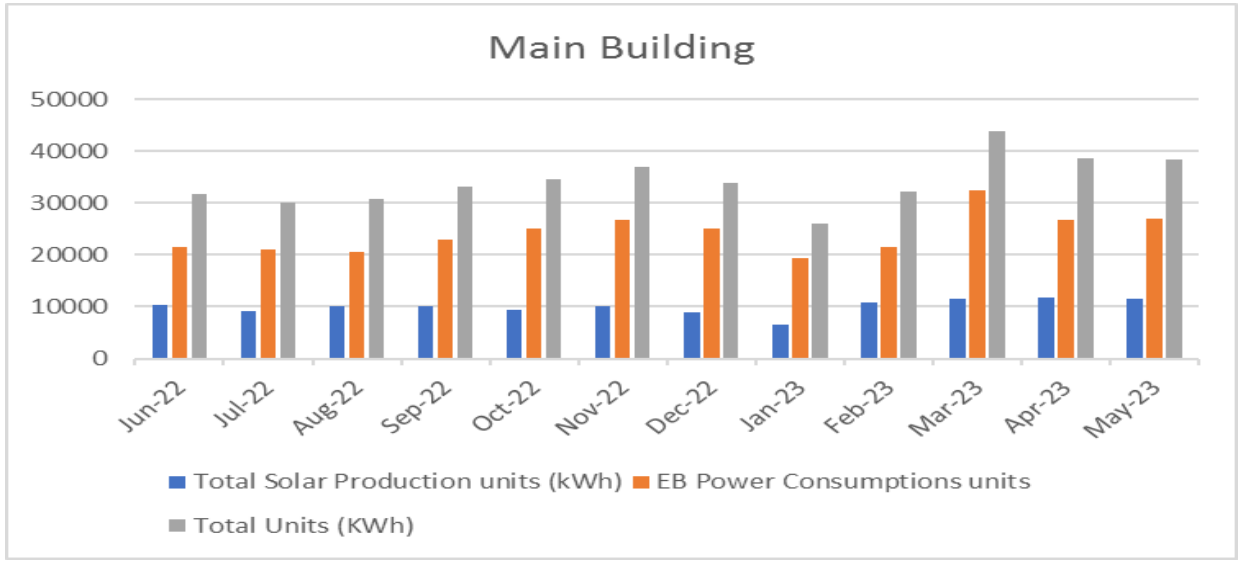
(a) average of 3 phase voltages
(b) average of 3 phase RMS currents and the average fundamental currents
(c) frequency
(d) various powers: active, reactive and apparent
(e) power factor
(f) % -age voltage THD
(g) %-age current THD
(h) various energy: active, reactive and apparent
(i) Unbalance in voltage and current

The summary details of the above measurements are provided in appendix. The college has Sanctioned Demand of 110 kW. The college having the diesel operated gen-set for providing power supply in case of power failure.

The total Solar Production units (kWh) and total EB Power Consumption units were given in below table and charts with month wise split-up.

Main building				
S.no	**Month**	**Total Solar Production units (kWh)**	**EB Power Consumptions units**	**Total Units (KWh)**
1	Jun 2022	10338	21416.4	31754.40
2	July 2022	9125.52	21022.4	30147.92
3	Aug 2022	10224.29	20688.8	30913.09
4	Sep 2022	10224.29	22859	33083.29
5	Oct 2022	9434.83	25134	34568.83
6	Nov 2022	10165.87	26704.4	36870.27
7	Dec 2022	8826.76	25138	33964.76
8	Jan 2023	6598.63	19435	26033.63
9	Feb 2023	10802.7	21505.6	32308.30
10	Mar 2023	11472.9	32350.4	43823.30
11	Apr 2023	11838.1	26746	38584.1
12	May 2023	11453.8	26972	38425.80

A1 BUILDING				
S.no	**Month**	**Total Solar Production units (kWh)**	**EB Power Consumptions units**	**Total Units (KWh)**
1	Jun 2022	4569	28134.4	32703.40
2	July 2022	4471.66	28056.8	32528.46
3	Aug 2022	3948.55	25489.2	29437.75
4	Sep 2022	3948.55	26941.6	30890.15
5	Oct 2022	4340.4	27554	31894.40
6	Nov 2022	4416.02	30778.8	35194.82
7	Dec 2022	4349.35	25316.8	29666.15
8	Jan 2023	5066	25102.4	30168.40
9	Feb 2023	5964.23	26786	32750.23
10	Mar 2023	6723.23	33796.8	40520.03
11	Apr 2023	6618.4	27374.8	33993.2
12	May 2023	6852.61	26872	33724.61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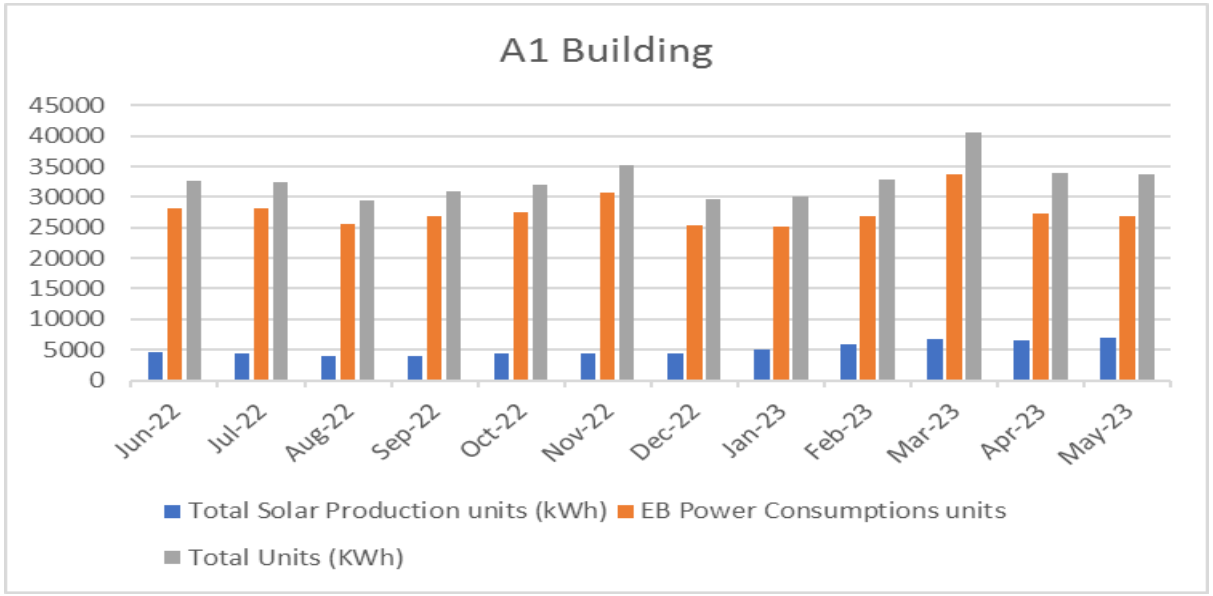
EB Power Consumptions units
Total Units (KWh)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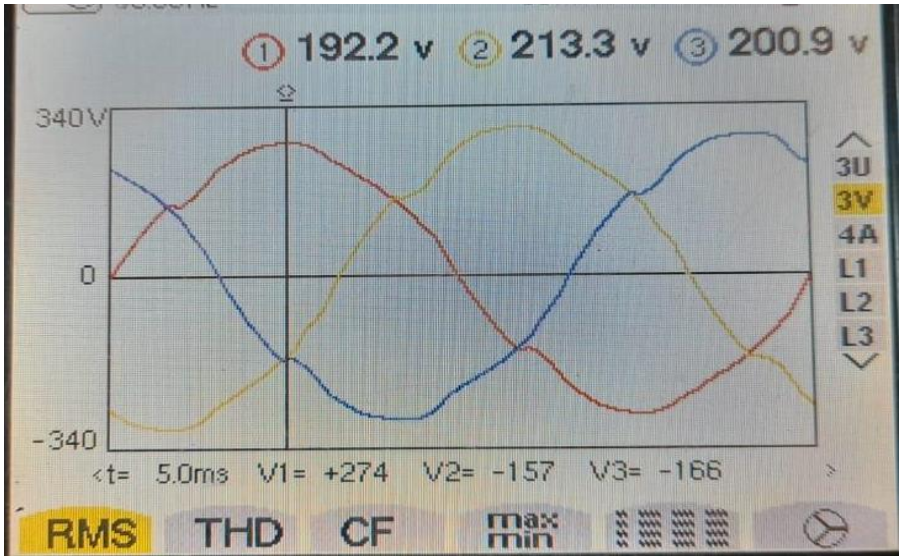
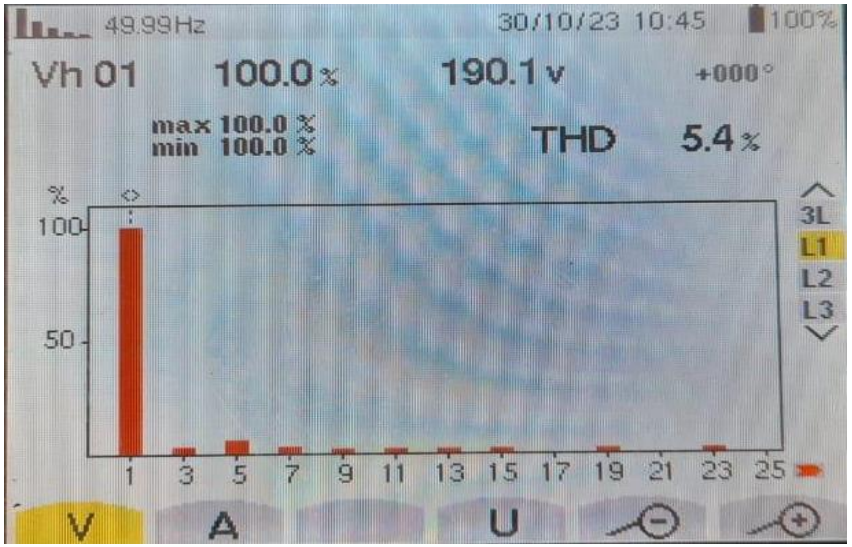
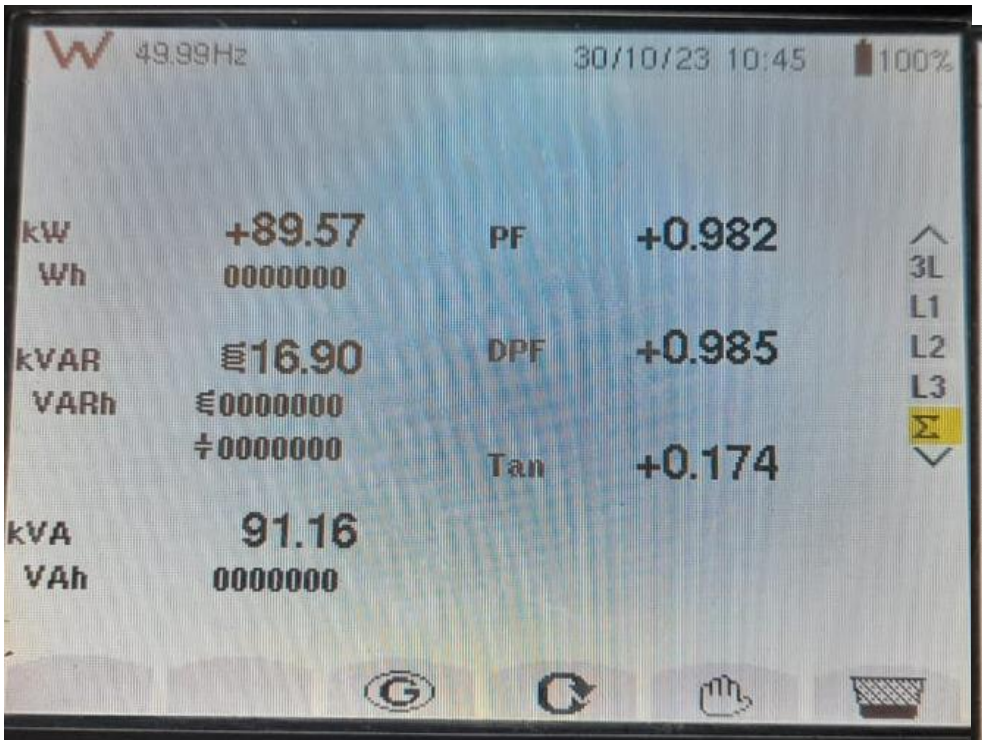
Total Solar Production units (kWh)
EB Power Consumptions units
Total Units (KWh)

7.1 Recorded Data



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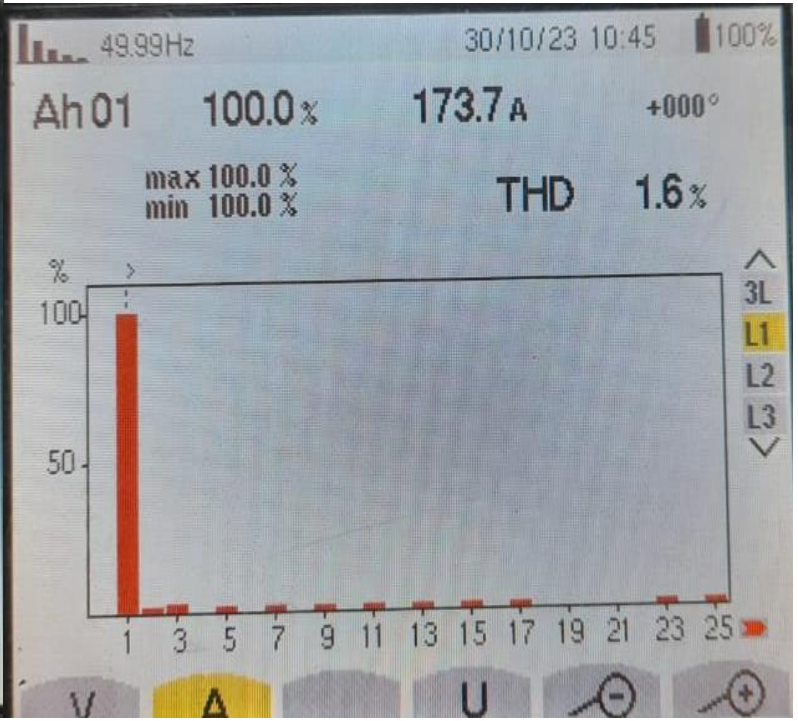
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7.2 Energy saving Opportunities

Lighting: SAMPLE CALCULATION FOR ENERGY SAVING

DESCRIPTION	FTL FITTINGS	LED FITTINGS
	36W	**18W**
No. OF FITTINGS	100	**100**
WATTS	36	**18**
TOTAL WATTS	3600	1800
CONSUMPTION UNITS PER DAY	54	**27**
RUNNING COST PER DAY	342.90	**171.45**
SAVINGS LED INSTEAD OF FTL IN WATTS	1800	
UNITS SAVINGS PER DAY	27.000	
UNITS SAVINGS PER MONTH	**810.000**	
RUNNING HOURS PER DAY	15	
PRESENT TNEB UNITS COST Rs.	6.35	
COST SAVINGS PER DAY Rs.	171.45	
COST SAVINGS PER MONTH Rs.	**5143.50**	
LED LIGHT FITTING TOTAL EXPENSES Rs. (100*Rs.650)	**65000.00**	
COST RETURN PERIOD IN DAYS	379	
COST RETURN PERIOD IN MONTHS	12.64	
COST RETURN PERIOD IN YEARS	**1.04**	

Fan: SAMPLE CALCULATION FOR ENERGY SAVING

DESCRIPTION	NORMAL FAN	**BLDC FAN**
	72W	**30W**
No. OF FITTINGS	100	**100**
TOTAL WATTS	7200	**3000**
CONSUMPTION UNITS PER DAY	79.200	**33.000**
RUNNING COST PER DAY	502.92	**209.55**
SAVINGS BLDC INSTEAD OF NORMAL FAN IN WATTS	4200	
UNITS SAVINGS PER DAY	46.200	
UNITS SAVINGS PER MONTH	**1386.000**	
RUNNING HOURS PER DAY	11	
PRESENT TNEB UNITS COST Rs.	6.35	
COST SAVINGS PER DAY Rs.	293.37	
COST SAVINGS PER MONTH Rs.	**8801.10**	
BLDC FAN TOTAL EXPENSES Rs. (100*Rs.3250)	**325000.00**	
COST RETURN PERIOD IN DAYS	1108	
COST RETURN PERIOD IN MONTHS	36.93	
COST RETURN PERIOD IN YEARS	**3.04**	

Air Conditioner: SAMPLE CALCULATION FOR ENERGY SAVING

Model	Star Rating	EER	Cooling Capacity	Power Consumption (Watts/Hr)	No. of Watts saved / Hr to 0 Star Level	No. of Units saved / 8 Hr.	**Savings (Rs / Yr) (300Days)
Split AC	5 Star	3.59	6212	1732	1268	10.1	19240
Split AC	3 Star	3.12	6044	1938	1062	8.5	16192
Split AC	2 Star	3	6610	2210	791	6.3	12001

(Actual may vary)

- **Raising AC setting by 1° can save 6% power**
- **Typically the temperature is set at 20-21 degree Celsius, whereas, the comfort number is 24-28 degree Celsius.**
- **A change from 20 degree Celsius to 24 degree Celsius, has the potential to save about 24 per cent of power.**

8.	BEST PRACTICES

- The energy is also conserved by using natural light in the classrooms. Fixation of sensor lights in the campus is under processing.
- LED bulbs and CFLs are being used in all possible locations as an energy conservation measure.
- Green transport is often practiced as an active transport system which encourages students to walk or cycle in the campus. The College has made arrangements for the parking of the vehicles of the students and staff near the entrance. With this active transport practice, the use of private vehicles on campus is reduced and thus can be a strategy to reduce traffic congestion and pollution in campus.
- Training programmes were conducted on Energy Conservation, Environment Impacts and Fuel Savings for i) Students, Staffs and Faculty Members (for the specified period) by any external agencies
- The college has been maintaining seventeen rain water recharging pits. Buildings in the college are linked to a rain water storage grid with varying capacities. These rainwater recharging systems help to recharge the ground water and thus the campus gets ample increase in the amount of ground water.
- The college herbal garden was setup in an area of 4000 square feet of land where medicinal and nourishment plants are cultivated. The college has four lawns and several hedges, as well as a variety of vegetation, which adds beauty and aesthetics to the campus. A gardener is assigned to guide irrigation, weeding, and manure application.
- Drip irrigation is used as an attempt to keep the hedges and landscaping in excellent condition. In order to maintain gardens and lawns 30 sprinklers have been installed. All of them have been in working conditions.

9. OBSERVATIONS AND RECOMMENDATIONS

Observations

(i) The maintenance of Power room is good.
(ii) The institute receives power from electricity board
(iii) The monthly average Power factor is maintained above 0.9
(iv) For Safety purpose, rubber mats as well as wooden board has been placed in front of panels in the power room

Recommendations

(i) Display messages regarding optimum use of electrical appliances in the laboratories and classrooms.
(ii) All computers to have power saving settings to turn off monitors and hard discs, say after 10 minutes / 30 minutes.
(iii) As the college is located at a place where solar intensity is sufficiently available, day lighting is sufficient for the class room environment which reduces the usage of lighting
(iv) It is good practice of testing the Earth Electrode and maintaining the minimum Earth Electrode resistance at college campus area
(v) It is recommended to improve the maintenance of existing solar power plant.
(vi) The energy saving opportunities for various equipments and cost savings are discussed in previous chapters.

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End of the Report

Thank You