



Environment Audit Report
Anwarul Uloom College (Autonomous),
New Mallepally, Hyderabad-500001, T.S., India
Year 2024-25



ENVIRONMENT AUDIT REPORT



Anwarul Uloom College (Autonomous)

11-3-918, New Mallepally, Hyderabad,
Telangana-500 001

PREPARED BY

EMPIRICAL EXERGY PRIVATE LIMITED

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(2024-25)



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ACKNOWLEDGEMENT

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We are genuinely touched by the helpful attitudes and cooperation displayed by all the faculty members and technical staff involved in the audit. Their valuable assistance and cooperation significantly contributed to the successful execution of the audit.

For- Empirical Energy Private Limited

Rajesh Kumar Singadiya

(Director)

M.Tech (Energy Management),
Accredited Energy Auditor [AEA-0284]
Certified Energy Auditor [CEA-7271]
(BEE, Ministry of Power, Govt. of India)
Empanelled Energy Auditor with MPUVN, Bhopal M.P.
Lead Auditor ISO50001:2011 [EnMS) from FICCI, Delhi
Chartered Engineer [M-1699118].
The Institution of Engineers (India)
Member of ISHRAE [58150]



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CERTIFICATE OF ACCREDITATION



BUREAU OF ENERGY EFFICIENCY



Examination Registration No.: EA- 7271

Accreditation Registration No.: AEA-284

Certificate of Accreditation

This is to certify that Mr./Ms. **Shri. Rajesh Kumar Singadiya** having its trade/registered office at has been given accreditation as accredited energy auditor. The certificate shall be effective from **9th** day of **May, 2018**

The certificate is subject to the provisions of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

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Given under the seal of the Bureau of Energy Efficiency, Ministry of Power, this **5th** day of **October, 2018**

Secretary,
Bureau of Energy Efficiency
New Delhi



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ENVIRONMENT AUDIT TEAM

The audit team constituted by the following senior technical executives from the Empirical Exergy Private Limited,

Sr. No.	Name of Audit Team	Designation	Qualifications	Experience (Years)	Specialization
1	Mr. Rajesh Kumar Singadiya	Director & Accredited Energy Auditor AEA-0284	M. Tech in Energy Management	20	Energy Audit & Safety Audit
2	Mr. Rakesh Pathak	Director & "A" Class Electrical Contractor	Diploma in Electrical Engineer	35	Electrical Audit & Electrical operation & Maintenance
3	Ms. Laxmi Raikwar Singadiya	Sr. Project Manager and report reviewer	M. Tech in Energy Management	15	Energy, Environment, Green Audit
4	Mr. Charchit Pathak	Sr. Project Engineer	B. Tech in Mechanical Engineering, MBA in Human Resource Management	5	Energy Audit, Green Audit, Safety Audit



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**GREEN, ENERGY AND ENVIRONMENT
MONITORING COMMITTEE**



Anwarul Uloom College (Autonomous)
(Affiliated to Osmania University)
Accredited with 'A+' Grade by NAAC
New Mallepally, Hyderabad-500001, T.S., India.



Date: June 13, 2025

OFFICE ORDER

The Energy Monitoring Committee of Anwarul Uloom College (Autonomous) is reconstituted as follows:

1. Mr. Mohammed Gouse, Senior Electrician
2. Mr. Mohd. Haseeb Ali, Accountant
3. Mr. T. Hemanth Kumar, Asst. Prof., Dept. of Commerce

The term of the members shall be two years.


Director

Copy to:
All concerned.

EXECUTIVE SUMMARY

The executive summary of the environment audit report furnished in this section briefly gives the identified water conservation measures that can be implemented in a phased manner to conserve water and increase the productivity of the college.

SUSTAINABLE INITIATIVE TAKEN BY COLLEGE

Plastic Banned

- As per environmental policy college has adopted plastic banned system in the campus. It's appreciable.

ENVIRONMENT AUDIT RECOMMENDATION

FRESH WATER MONITORING SYSTEM

- Installation of "Cloud based (IoT based) ground water extraction monitoring system" for bore well to quantify fresh water consumption per day in the college.
- Install water flow meters (Mechanical or Electronics) on borewell for quantity per day water consumption.

WASTE WATER TREATMENT PLANT

- There is requirement to install sewerage treatment plant (STP) for waste water generated from various activities in college. All waste water generated from drinking, washing is collected in separate tank and it should be treated in propose STP plant.

DRIP WATER IRRIGATION SYSTEM.

- Use drip water irrigation system for trees and plants.

WATER SPRINKLER SYSTEM

- There is good potential to install water sprinkler system for garden area in college. It will be reduced water consumption of college.

USE EFFICIENT WATER TAPS

- Water saving taps either reduce water flow or automatically switch off to help save water. So, it is highly recommended to install efficient water taps in college to reduce water consumption.



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CHAPTER-1
INTRODUCTION

1.1 About College

Anwarul Uloom College was established in August 1953 by the Anwarul Uloom Educational Association. Located in the heart of the city, the college is a prominent institution in Hyderabad. It was granted permanent affiliation by Osmania University in 1960 and recognized under Section 12f 2b of the UGC Act, 1956. In the academic year 1988-89, the institution was conferred first time autonomous status, which it continues to enjoying and in august 2023 UGC granted 10 years of autonomy to the college. Demonstrating its commitment to quality, the college was accredited with an A+ Grade by NAAC in 2023, becoming the first Muslim Minority Institution in Telangana to receive this recognition. The college is also certified with ISO 9001:2015 standards and actively participated in NIRF ranking and submit data to the AISHE on regular basis.

Institutional Overview:

- Student Strength: 5500 approx.
- Undergraduate Programs: 24
- Postgraduate Programs: 8
- Campus Area: 3 acres
- Number of Blocks: 8
- Classrooms: 83 (50% are Smart Classes)

The college operates with a dynamic and experienced faculty. There is the student teacher ratio 25:1. The institution has maintained a student-centric approach, enhancing academic standards, research, and infrastructural growth.

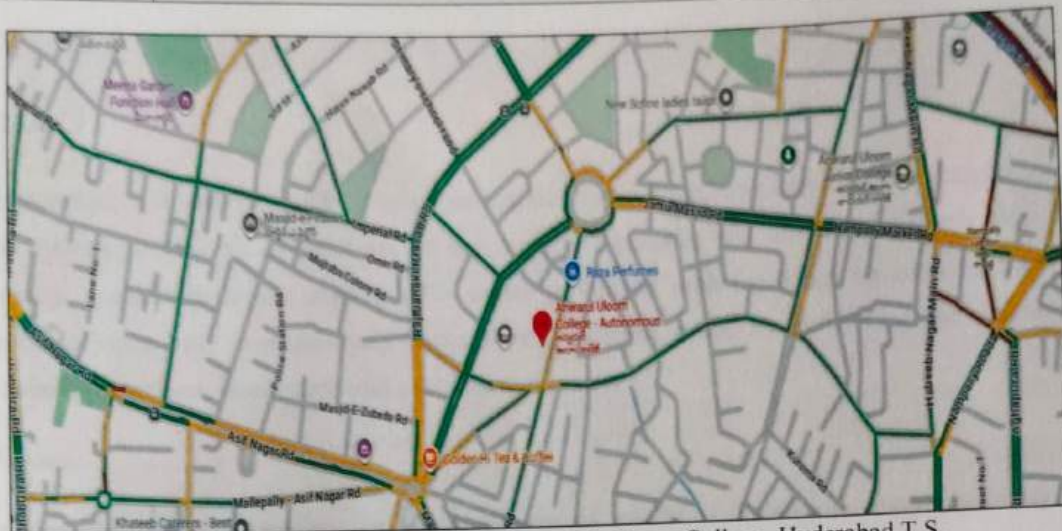
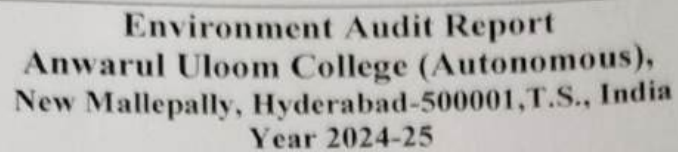


Fig.1.1-Source: Satellite Image of Anwarul Uloom College, Hyderabad T.S.

Management of the College:

Anwarul Uloom College functions under the aegis of the Anwarul Uloom Educational Association. Hon. Secretary, Nawab Mehboob Alam Khan's leadership reflects a combination of experience, knowledge, and dynamism. His vision has acted as a catalyst for institutional growth, program expansion, and infrastructural development.



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Vision

To provide skill-based quality higher education by striving continuously for excellence in educational service to all sections of the society especially the minority students who are socially, economically and academically under privileged with the focus on empowerment of youth to contribute constructively towards the national goals by upholding the values of secularism, national integration and social commitment.

Mission:

To provide higher education for empowerment of youth of Telangana state especially the marginalized people has been the main thrust of this college. The institution is committed to the under-privileged of the society and students with high potential facing difficult socio-economic circumstances, so as to bring them at par with mainstream. Our mission is to impart quality education and exposure for the holistic development of students and equip them to cope with the latest requirements, through innovative techniques and practices.



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Programmes Offered in the College

1. B.B.A.
2. B.B.A. (AI and Data Science)
3. B.B.M
4. B.Com. General
5. B.Com. Computer Application
6. B.Com.E.Com.
7. B.Com. Advertising, Sales Mgt., & Sales Promotion
8. B.Com. Business Process Mgt.
9. B.Com. Foreign Trade
10. B.Sc. MPC (Maths, Physics & Chemistry)
11. B.Sc. BZC (Botany, Zoology & Chemistry)
12. B.Sc. MECs (Maths, Electronics & Computer Science)
13. B.Sc. MPCs (Maths, Physics & Computer Science)
14. B.Sc. CS Engg. (Computer Science & Engineering)
15. B.Sc. NZC (Nutrition, Zoology & Chemistry)
16. B.Sc. Food Science
17. B.Sc. Animation
18. B.Sc. Data Science
19. B.Sc. Artificial Intelligence and Machine Learning
20. B.Sc. BMC (Bio-Technology, Micro Biology & Chemistry)
21. B.Sc. Hons. Biomedical Sciences
22. B.A. EPP E/M
23. B.A. HPML U/M
24. B.A. EHP



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PG Programmes:

1. M.A. English
2. M.Com. (Finance)
3. M.Sc. Botany
4. M.Sc. Chemistry
5. M.Sc. Mathematics
6. M.Sc. Bio-Technology
7. M.Sc. Nutrition & Dietetics
8. M.Sc. Microbiology

PG Diploma, Diploma and Certificate Courses

1. PG Diploma in Nutrition & Dietetics
2. Diploma in Communicative English and Soft Skills
3. Diploma Course in Arabic Translation.
4. Diploma Course in Arabic DTP
5. Diploma in Medical Lab Technology (DMLT)
6. Certificate Course in Communicative English and Soft Skills
7. Certificate Course in Communicative English and Interpersonal skills
8. Certificate in Tajweed ul Quran
9. Certificate Course in Urdu DTP
10. Certificate Course in Phyto chemistry
11. Certificate Course in Analytical Techniques in Chemistry



Environment Audit Report Anwarul Uloom College (Autonomous), New Mallepally, Hyderabad-500001, T.S., India Year 2024-25



About College Campus

The college Infrastructure Facilities

- Campus Area: 3 acres
- Number of Blocks: 8
- Departments: 23
- Classrooms: 83 (50 Smart Classes)
- Wi-Fi-enabled Campus





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1.2 About Environment Audit

Environment audits can be a highly valuable tool for a college in a wide range of ways to improve their energy, environment and economic performance. While reducing waste and operating costs, Environment audits provide a basis for calculating the economic benefits of water conservation projects by establishing the current rates of water use and their associated cost.

1.3 Objectives of Environment Audit

The general objective of an environmental audit is to prepare a baseline report on water conservation measures to mitigate consumption, improve quality, and promote sustainable practices.

The specific objectives

To monitor the water consumption and water conservation practices.

To assess the quantity of water, usage, quantity of waste water generation and the reduction within the college.

1.4 Target Areas of Environment Audit

This indicator addresses water sources, water consumption, irrigation, storm water, appliances and fixtures aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible institution should examine its water use practices.



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1.5 Methodology followed for conducting Environment (Water) audit

Step 1: Walk Through Survey

- ❖ Understanding of existing water sourcing, storage and distribution facility.
- ❖ Assessing the water demand and water consumption areas/processes.
- ❖ Preparation of detailed water circuit diagram.

Step 2: Secondary Data Collection

- ❖ Analyze historic water use and wastewater generation.
- ❖ Field measurements for estimating current water use.
- ❖ Metered & unmetered supplies.
- ❖ Understanding of "base" flow and usage trend at site.
- ❖ Past water bills.
- ❖ Waste water treatment scheme & costs etc.

Step 3: Site Environment (Water) Audit Planning (based on-site operations and practices)

- ❖ Preparation of water flow diagram to quantify water use at various locations
- ❖ Wastewater flow measurement and sampling plan

Step 4: Conduction of Detailed Environment (Water) Audit & Measurements

- ❖ Power measurement of pumps/motors
- ❖ Preparation of water balance diagram
- ❖ Establishing water consumption pattern
- ❖ Detection of potential leaks & water losses in the system
- ❖ Assessment of productive and unproductive usage of water
- ❖ Determine key opportunities for water consumption reduction, reuse & recycle.

Step 5: Preparation of Environment (Water) Audit Report

- ❖ Documentation of collected & analyzed water balancing and measurement details
- ❖ Projects and procedures to maximize water savings and minimize water losses.
- ❖ Opportunities for water conservation based on reduce/recycle/reuse and recharge options.



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CHAPTER- 2

WATER CONSUMPTION AND WASTE WATER SOURCES

2.1 Details of Source of Fresh Water

The main source of freshwater is Bore well for the college. The freshwater is mainly used for drinking, housekeeping, gardening, domestic activity and new construction project. Details of the pumps are given in table.

Table: 2.1 Details of Fresh water sources

Sr. No	Source of Water	Depth (ft/m)	Type of Pumps	Rated (HP)
1	Bore well -01	170 ft	Submersible	5 kW
2	Bore well-02	200 ft	Submersible	3 kW

2.2 Water Accounting and Meter system

It was observed that there is a requirement for water flow meters on the bore wells to quantify daily groundwater extraction.

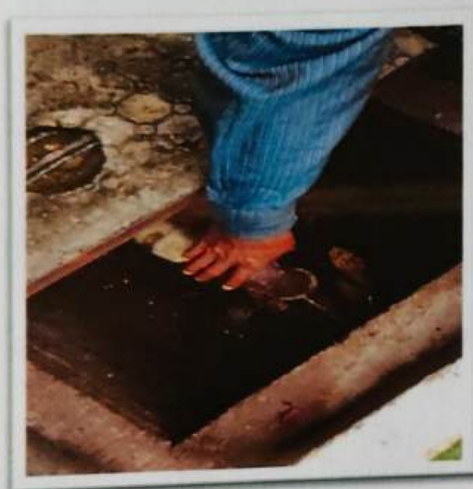


Figure: - 2.1 fresh water supply from Borewell



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2.3 Fresh Water uses for Gardening

College has installed drip irrigation system in Stadium and Sport ground. **Its Appreciable** The one of major contribution from fresh water consumption is watering for other plants in college campus. There is good potential for water saving by adopt "Automatic Watering 360 adjustable misting nozzle irrigation Dripper's system" for plants. adjustable drip irrigation tools to provide different amounts of water depending on the water requirements of different plants. The drip speed can be set as for indoor and outdoor plants.



Adjustable Misting Nozzle Irrigation Drippers



Automatic Water Timer Unit



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2.4 Waste Water Generation sources

Water Quality Assessment

To cater the water requirement for the campus, two bore wells and one open well water are used for the activities. However in summer, to cater the additional shortage of water, a tanker from outside are hired to satisfy the needs of campus activities. The total quantity of water required for drinking is assessed for a population of 5000 students is assessed as 25000 liters per day. For hygienic drinking water, RO plants are installed in each block. In order to provide portable drinking water there are 10 RO's at various locations in the campus. Civil Engineering department tests the water every month. Once in six months the water is tested by Iota Laboratories, Hyderabad. The committee inspects the working of filters monthly and the quality of water is verify for suitability once in three months.

Recycling of waste water

(The wastewater developed in college campus is treated in campus and is used for watering of garden. The institute does not have a Sewage Treatment Plant (STP). It is suggested to install a STP with the capacity 2,10,000 lit. Capacity per day) Transferred to suggestion. The quantity of wastewater generated in the campus should be assessed as per IS standards (IS 9868/1981) are given below

The Demand of Water for Anwarul Uloom College Campus

Sr. No.	Location	Student strength (No.)	IS Demand (lpcd)	Water Quantity (lpcd)
1	Canteen	1000	180	180000
2	Institute	5000	45	225000
Total				405000



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The sewage treatment plant is not available may be considered by the college authorities for installation. Their services include viz.,

- a) They shall provide skilled operators for all three shifts to operate monitor and ensure consistent performance of the STP.
- b) They shall monitor activities of STP and report the same to his Plant Engineer regularly with all the necessary supporting documents like plant Log sheet, checklist etc.
- c) They shall provide all necessary chemicals.
- d) They shall carry out the cleaning of tanks, Sludge drying beds as and when required.
- e) They shall provide the lubricants and consumables required during operation and maintenance of the STP.
- f) They shall carry out preventive maintenance of the equipment as per schedule.
- g) All repairs like rewinding of motors, repair of gear boxes, pumps spares and blower, accessories, bearings, lobes will be carried out by you. However the spares required will be provided by NMIT.
- h) It will be their responsibility to maintain clean and tidy environment surrounding STP area.
- i) It shall be their responsibility to test the treated water sample (only one sample in a month) in a KSPCB approved Lab and get the report for monthly report to KSPCB.
- j) It shall be their responsibility to prepare and submit the Consent Application for water, Air and Hazardous waste every year. (Consent fees and other KSPCB Expenses will be met by Client).
- k) Their personnel who stay in the campus shall take security clearance and shall abide by the college rules and discipline.

Even though the firm tests the water sample every month, the department of Civil Engineering will analyze the water once in six months to oversee the activities of the contract person.



CHAPTER- 3 RAIN WATER HARVESTING SYSTEM

3.1 Rainwater Harvesting systems

Rainwater harvesting is a technique to capture the rainwater when it precipitates, store that water for direct use or charge the groundwater and use it later. There are typically four components in a rainwater harvesting system: Roof Catchment, Collection, Transport and Infiltration or storage tank and use. If rainwater is not harvested and channelized it runoff quickly and flows out through storm-water drains. For storm-water management, the recharge pits, percolation pits, and porous trenches are constructed to allow storm water to infiltrate inside the soil.

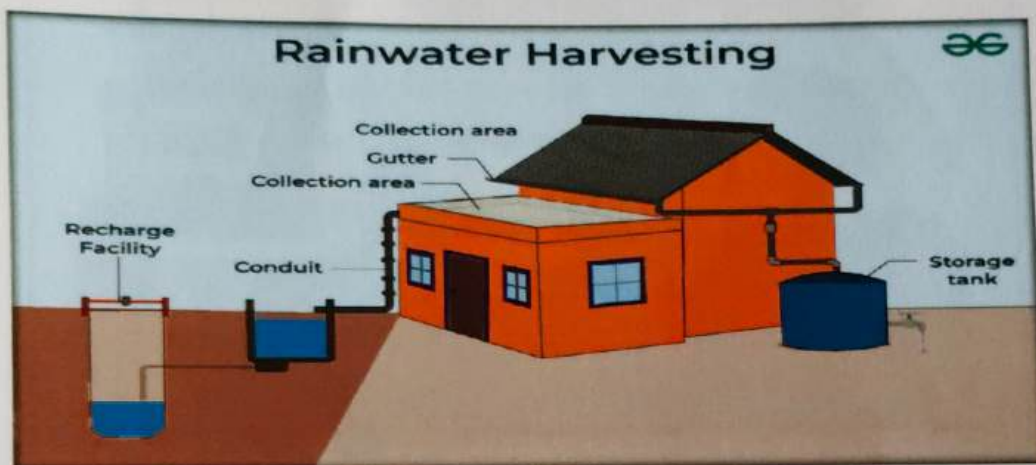


Figure 3.1 Components of rooftop rainwater harvesting system



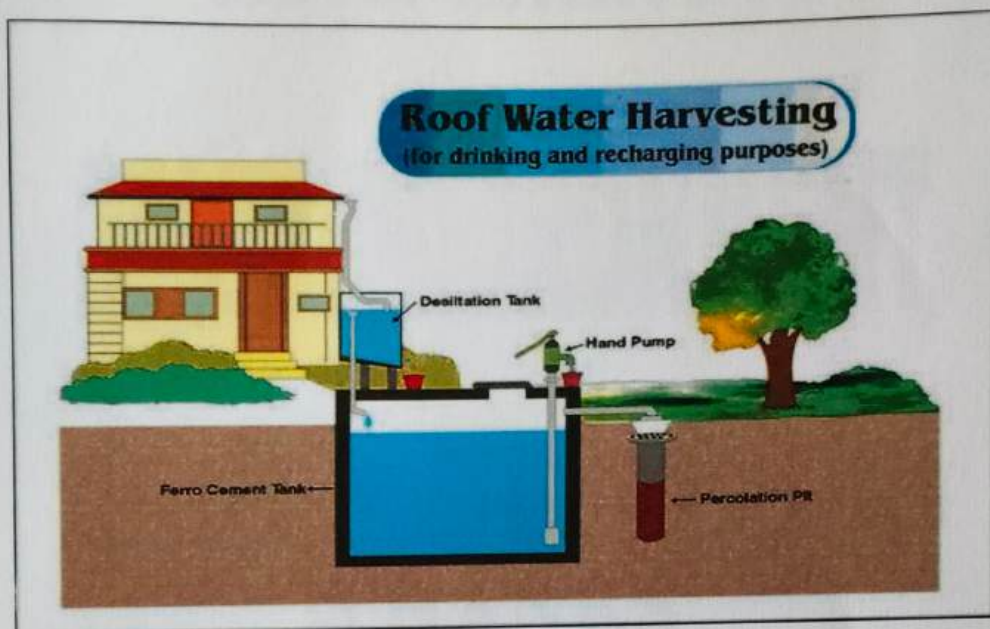
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3.2 Rain Water Harvesting (RWH)

The college has total build-up area is about 3,221 m². The average annual rain 2.07 m and runoff coefficient 0.88 is considered for commercial building. Accordingly, above figures and consideration, estimated rainwater harvesting potential for the college is about 5,867 m³/year. The following Mathematical Equation is used for the calculation.

RWH Potential = Rainfall (m) x Area of catchment (rainfall m²) x Runoff coefficient





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SAVE ENERGY

SAVE ENVIRONMENT

**END OF THE REPORT
THANKS**



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	<p style="text-align: center;">Green Audit Report Anwarul Uloom College (Autonomous), New Mallepally, Hyderabad-500001, T.S., India Year 2024-25</p>	
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Given under the seal of the Bureau of Energy Efficiency, Ministry of Power, this **5th** day of **October, 2018**


Secretary,
Bureau of Energy Efficiency
New Delhi



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GREEN AUDIT TEAM

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**GREEN, ENERGY AND ENVIRONMENT
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Director

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EXECUTIVE SUMMARY

Green Audit is the most efficient way to identify the strength and weakness of environmentally sustainable practices and to find a way to solve problem. The executive summary of the Green Audit report furnished in this section briefly gives the identified green initiative taken by college and further recommendation for green campus, and their impact on carbon foot print in the campus.

GREEN INITIATIVES TAKEN BY COLLEGE

🌱 Campaign of Plantation And Green Campus

The college has around 5318 trees on campus. It is a good initiative taken by the management for creating a green campus under the plantation campaign. This effort is commendable.

🌱 E-vehicle System

The management has use E- vehicle in the campus for internal movement of staff and students. It's save nature resource as well as improved air quality of the campus. It is appreciable.

🌱 Grid Connected Solar Photovoltaic System (100 KWp)

There is 100KWp solar photovoltaic roof top grid connected systems installed on Block-C& Block-D building. It is appreciable.

GREEN AUDIT RECOMMENDATION

🌱 QR Code System on Tree

While the world seems to be going digital, people lack the time to read books and process the information they contain. Therefore, the college can provide QR codes on the trees to share information and leverage this rapidly growing platform for a unique purpose.

🌱 Air Monitoring System

Installation of "Cloud based (IoT based) Air Quality monitoring system in the Campus" to monitor air quality index for college campus



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CHAPTER-1
INTRODUCTION

1.1 About College

Anwarul Uloom College was established in August 1953 by the Anwarul Uloom Educational Association. Located in the heart of the city, the college is a prominent institution in Hyderabad. It was granted permanent affiliation by Osmania University in 1960 and recognized under Section 12f 2b of the UGC Act, 1956. In the academic year 1988-89, the institution was conferred first time autonomous status, which it continues to enjoying and in august 2023 UGC granted 10 years of autonomy to the college. Demonstrating its commitment to quality, the college was accredited with an A+ Grade by NAAC in 2023, becoming the first Muslim Minority Institution in Telangana to receive this recognition. The college is also certified with ISO 9001:2015 standards and actively participated in NIRF ranking and submit data to the AISHE on regular basis.

Institutional Overview:

- Student Strength: 5824 approx.
- Undergraduate Programs: 24
- Postgraduate Programs: 8
- Campus Area: 3 acres
- Number of Blocks: 8
- Classrooms: 83 (50% are Smart Classes)

The college operates with a dynamic and experienced faculty. There is the student teacher ratio 25:1. The institution has maintained a student-centric approach, enhancing academic standards, research, and infrastructural growth.



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Vision

To provide skill-based quality higher education by striving continuously for excellence in educational service to all sections of the society especially the minority students who are socially, economically and academically under privileged with the focus on empowerment of youth to contribute constructively towards the national goals by upholding the values of secularism, national integration and social commitment.

Mission:

To provide higher education for empowerment of youth of Telangana state especially the marginalized people has been the main thrust of this college. The institution is committed to the under-privileged of the society and students with high potential facing difficult socio-economic circumstances, so as to bring them at par with mainstream. Our mission is to impart quality education and exposure for the holistic development of students and equip them to cope with the latest requirements, through innovative techniques and practices.



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Programmes Offered in the College

1. B.B.A.
2. B.B.A. (AI and Data Science)
3. B.B.M
4. B.Com. General
5. B.Com. Computer Application
6. B.Com.E.Com.
7. B.Com. Advertising, Sales Mgt., & Sales Promotion
8. B.Com. Business Process Mgt.
9. B.Com. Foreign Trade
10. B.Sc. MPC (Maths, Physics & Chemistry)
11. B.Sc. BZC (Botany, Zoology & Chemistry)
12. B.Sc. MECs (Maths, Electronics & Computer Science)
13. B.Sc. MPCs (Maths, Physics & Computer Science)
14. B.Sc. CS Engg. (Computer Science & Engineering)
15. B.Sc. NZC (Nutrition, Zoology & Chemistry)
16. B.Sc. Food Science
17. B.Sc. Animation
18. B.Sc. Data Science
19. B.Sc. Artificial Intelligence and Machine Learning
20. B.Sc. BMC (Bio-Technology, Micro Biology & Chemistry)
21. B.Sc. Hons. Biomedical Sciences
22. B.A. EPP E/M
23. B.A. HPML U/M
24. B.A. EHP



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PG Programmes:

1. M.A. English
2. M.Com. (Finance)
3. M.Sc. Botany
4. M.Sc. Chemistry
5. M.Sc. Mathematics
6. M.Sc. Bio-Technology
7. M.Sc. Nutrition & Dietetics
8. M.Sc. Microbiology

PG Diploma, Diploma and Certificate Courses

1. PG Diploma in Nutrition & Dietetics
2. Diploma in Communicative English and Soft Skills
3. Diploma Course in Arabic Translation.
4. Diploma Course in Arabic DTP
5. Diploma in Medical Lab Technology (DMLT)
6. Certificate Course in Communicative English and Soft Skills
7. Certificate Course in Communicative English and Interpersonal skills
8. Certificate in Tajweed ul Quran
9. Certificate Course in Urdu DTP
10. Certificate Course in Phyto chemistry
11. Certificate Course in Analytical Techniques in Chemistry



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About College Campus

The college Infrastructure Facilities

- Campus Area: 3 acres
- Number of Blocks: 8
- Departments: 23
- Classrooms: 83 (50 Smart Classes)
- Wi-Fi-enabled Campus





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1.2 About Green Audit

Eco campus is concepts implemented in many educational institutions, all over the world to make them sustainable because of their mass resource utilization and waste discharge in to the environment.

Green audit means to identify opportunities to sustainable development practices, enhance environmental quality, improve health, hygiene and safety, reduce liabilities achieve values of virtue. Green audit also provides a basis for calculating the economic benefits of resource conservation projects by establishing the current rates of resource use and their associated costs.

Green auditing of "Anwarul Uloom College, New Mallepally, Hyderabad-500001, T.S., India" enables to assess the life style, action and its impact on the environment. This green audit was mainly focused on greening indicators like utilization of green energy (solar energy) and optimum use of secondary energy sources (petrol and diesel) in the Institute campus, vegetation, and carbon foot print of the campus etc. The aim of green auditing is to help the institution to apply sustainable development practices and to set examples before the community and young learners.

1.3 Objectives of Green Audit

The general objective of green audit is to prepare a baseline report on "Green campus" and alternative energy sources (solar energy), measures to mitigate resource wastage and improve sustainable practices.

The specific objectives are:

- ✚ To inculcate values of sustainable development practices through green audit mechanism.
- ✚ Providing a database for corrective actions and future plans.
- ✚ To identify the gap areas and suggest recommendations to improve the green campus status of the institutes.



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CHAPTER- 2

GREEN CAMPUS AND SUSTAINABLE DEVELOPMENT

2.1 Green Audit

In the survey, focus has been given on assessment of present status of diversity in form of plants, in college campus and efforts made by the College authorities for nature conservation. Campus is located in the vicinity of approximately more than 1532 trees/ medicinal herbs/ ornamental plants. The detail is given below.



Figure:-2.2 Green Campus of College



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2.2 Greening the campus

1	Is there a garden in your institute?	Yes, about 1.5 Acre is the Green Area.	
2	Do students spend time in the garden?	2-4 Hours during winters	
3	Total number of Plants in Campus	Plant type	Approx. number
		Trees	More than 350
		Shrubs	More than 1000
		Grass Cover	1.5 Acre
4	Suggest plants for your campus. (Trees, vegetables, herbs, etc.)	Ashoka, Ficus Religiosa, Boganvella, Alovera, Azadirachta indica, and many more as per geographical regime.	
5	Is the College campus have any Horticulture Department	Yes	
	Number of Staff working in Horticulture Department	Five Gardeners	
6	Number of Tree Plantation Drives organized by College per annum. (If Any)	Yes, Three Tree Plantation Drives are Organized Annually. 50+ trees and 100+ shrubs planted in this financial year.	
7	Number of Trees Planted in Last FY.	80	
	Survival Rate	90%	
8	Plant Distribution Program for Students and Community	Yes, Seed Bank is developed and, Saplings are distributed to Students and visitors at various Occasions.	
9	Plant Ownership Program	No	



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2.3 List of plants in College campus

The college has 1532 trees on its campus. This initiative taken by the management to create a green campus under the plantation campaign is highly commendable.

Sr. No.	Name of Tree/Plant	Botanical Name	Family
1	Veld grape	Cissusquadrangularis	Vitaceae
2	Crown of thorns	Euphorbia milii	Euphorbiaceae
3	Adenium	Adeniumobesum	Apocynaceae
4	Starfish flower	Huerniamacrocarpa	Apocynaceae
5	Jade Plant	Crassulaovata	Crassulaceae
6	Miracle leaf	Kalanchoepinnata	Crassulaceae
7	Seneciohimalaya	Seneciobarbertonicus	Asteraceae
8	Widow's-thrill	Kalanchoefedtschenkoi	Crassulaceae
9	Swiss cheese plant	Monsteraadansonii	Araceae
10	Snake plant	Dracaena trifasciata	Asparagaceae
11	Holy basil or Tulsi plant	Ocimum sanctum	Lamiaceae
12	Sabza Plant	Ocimumbasilicum	Lamiaceae
13	Areca Palm	Dypsislutescens	Arecaceae
14	Fishtail Palm	Caryotaurens	Arecaceae
15	Foxtail palm	Wodyetiabifurcata,	Arecaceae
16	Neem	Azadirachtaindica	Meliaceae
17	Nerium	Nerium Oleander	Apocynaceae
18	Yellow flame	Peltophorumpterocarpum	Fabaceae
19	Peacock Flower	Caesalpinia pulcherrima	Fabaceae
20	Insulin Plant	Costusigneus	Costaceae
21	Golden duranta	Durantaerecta	Verbenaceae
22	Aloe	Aloe vera	Liliaceae
23	Cactus	Opuntia	Cactaceae
24	Butterfly Pea	Clitoriaternatea	Fabaceae
25	Hairy Stem Spiderwort	Tradescantiafluminensis	Commelinaceae
26	4'o clock plant	Mirabilis jalapa	Nyctaginaceae
27	Weeping Bottlebrush	Melaleuca viminalis	Myrtaceae
28	West Indian Holly	LeeaCoccinea	Vitaceae
29	Weeping fig	Ficusbenjamina	Moraceae
30	Garden croton	Codiaeumvariegatum	Euphorbiaceae
31	Chinese fan palm	Livistonachinensis	Arecaceae
32	Cabbage palm	Cordylifruticosa	Asparagaceae
33	Arrowhead vine	Syngoniumpodophyllum	Araceae
34	Indian acalypha	Acalyphaindica	Malpighiales



CHAPTER-3 CARBON FOOT PRINT ASSESSMENT

3.1 About Carbon Foot Print.

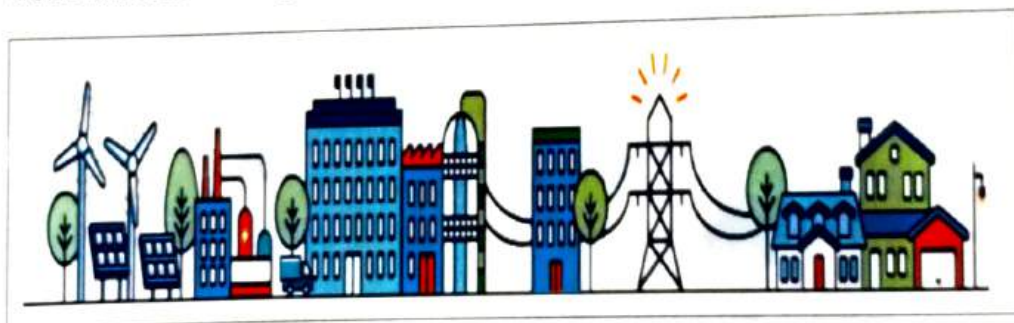
Climate change is one of the greatest challenges facing nations, governments, institutions, business and mankind today.



Carbon footprint is a measure of the impact your activities have on the amount of carbon dioxide (CO_2) produced through the burning of fossil fuels and is expressed as a weight of CO_2 emissions produced in tones. We focus on consumption in each of our five major categories: housing, travel, food, products and services. In addition to these we also estimate the share of national emissions over which we have little control, government purchases and capital investment.

For simplicity and clarity all our calculations follow one basic method. We multiply a use input by an emissions factor to calculate each footprint. All use inputs are per individual and include things like fuel use, distance, calorie consumption and expenditure. Working out your inputs is a matter of estimating them from your home, travel, diet and spending behaviour.

Although working out our inputs can take some investigation on your part the much more challenging aspect of carbon calculations is estimating the appropriate emissions factor to use in your calculation. Where possible you want this emissions factor to account for as much of the relevant life cycle as possible.

We all have a carbon footprint...



	<p style="text-align: center;">Green Audit Report Anwarul Uloom College (Autonomous), New Mallepally, Hyderabad-500001, T.S., India Year 2024-25</p>	
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3.2 Methodology and Scope

The carbon footprint gives a general overview of the greenhouse gas emissions, converted into CO₂ -equivalents and it is based on reported data from internal and external systems. The purposes of the carbon indicators are to measure the carbon intensity per unit of product, in addition to showing environmental transparency towards external stakeholders. The carbon footprint reporting approach undertaken in this study follows the guidelines and principles set out in the "Greenhouse Gas Protocol Corporate Accounting and Reporting Standard" (hereafter referred to as the GHG Protocol) developed by the Greenhouse Gas Protocol Initiative and international standard for the quantification and reporting of greenhouse gas emissions -ISO 14064. This is the most widely used and accepted methodology for conducting corporate carbon footprints.

The study has assessed carbon emissions from the college Campus. This involves accounting for, and reporting on, the GHG emissions from all those activities for which the college is directly responsible. The items quantified in this study are as classified under the ISO 14064 standards: The report calculates the greenhouse gas emissions from the college. This includes electricity, as well as emission associated with diesel consumption in the college vehicle. The emission associated with air travel, waste generation, administration, and marketing related activities has been excluded from the current study.

3.3 Carbon emission from electricity

Direct emissions factors are widely published and show the amount of emissions produced by power stations in order to produce an average kilowatt-hour within that grid region. Unlike with other energy sources the carbon intensity of electricity varies greatly depending on how it is produced and transmitted. For most of us, the electricity we use comes from the grid and is produced from a wide variety of sources. Although working out the carbon intensity of this mix is difficult, most of the work is generally done for us.

Electricity used in the site is the significant contributors towards GHGs emission from the unit. Electricity used onsite is the most direct, and typically the most significant, a contributor to a

unit's carbon footprint. Thus, using an average fuel mix of generating electricity, carbon dioxide intensity of electricity for national grid is assumed to be 0.9613 KgCO₂/KWh.

3.4 Emission Due to Grid Power Consumption

Table 4.1: Emission due to Electricity from Grid Unit

Sr. No.	Year	Energy Consumption (kWh/Year)	Emission Factor (kg CO ₂ e/kwh)	Emission (Ton CO ₂ e/year)
1	2024-25	95718	0.9613	92.01

3.5 Biomass Calculation and CO₂ Sequestration of the Trees

1. Estimation of above-ground biomass (AGB)

$$K = 34.4703 - 8.0671D + 0.6589 D^2$$

Where = K is above-ground biomass.

D is Breast height diameter in (cm)

2. Estimation of below ground biomass (BGB) = AGB x 0.15

3. Total Biomass (TB) = AGB + BGB

4. Calculation of carbon dioxide Weight sequestered in the tree in Kg.

$$C = W \times 0.50$$

5. Calculation the weight of CO₂ sequestered in the tree per year in Kg.

$$CO_2 = C \times 3.666$$

Where: -

🌳 AGB = above ground biomass.

🌳 D = Diameter of tree breast height.

🌳 BGB = Below Ground Biomass.

🌳 C = Carbon

🌳 TB = Total Biomass.



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3.6 Biomass calculation of the tree

Sr. no.	Tree Name	Botanical Name	Average Diameter cm (10 to 100)	AGB	BGB	Total	Carbon Storage	Amount of CO ₂ Sequestered	Total Amount of CO ₂ Sequestered	Annually CO ₂ Sequestered amount (Ton/year)
1	Veld grape	Cissusquadrangularis	20	144.7	21.7	166.4	83.2	305.0	25	1525
2	Crown of thorns	Euphorbia milii	30	403.5	60.5	464.0	232.0	850.5	20	4252
3	Adenium	Adeniumobesum	10	21.7	3.3	24.9	12.5	45.7	15	549
4	Starfish flower	Huerniamacrocarpa	50	1328.4	199.3	1527.6	763.8	2800.1	2	42002
5	Jade Plant	Crassulaovata	90	4807.5	721.1	5528.7	2764.3	10134.0	4	50670
6	Miracle leaf	Kalanchoepinnata	40	798.0	119.7	917.7	458.9	1682.2	8	8411
7	Seneciobimalaya	Seneciobarbertonicus	10	21.7	3.3	24.9	12.5	45.7	1	914
8	Widow's-thrill	Kalanchoefedtschenkoi	40	798.0	119.7	917.7	458.9	1682.2	1	16822
9	Swiss cheese plant	Monsteraadansonii	12	35.4	5.3	40.7	20.4	74.7	3	373
10	Snake plant	Dracaena trifasciata	50	1328.4	199.3	1527.6	763.8	2800.1	2	84004
11	Holy basil or Tulsi plant	Ocimum sanctum	40	798.0	119.7	917.7	458.9	1682.2	80	8411
12	Sabza Plant	Ocimumbasilicum	100	6016.8	902.5	6919.3	3459.6	12683.1	300	253661



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Sr. no.	Tree Name	Botanical Name	Average Diameter cm (10 to 100)	AGB	BGB	Total	Carbon Storage	Amount of CO ₂ Sequestered	Total Amount of CO ₂ Sequestered	Annually CO ₂ Sequestered amount (Ton/year)
13	Areca Palm	Dypsislutescens		34.5	5.2	39.6	19.8	72.7	36.3	0.00
14	Fishtail Palm	Caryotaurens	15	66.2	9.9	76.2	38.1	139.6	139.6	0.02
15	Foxtail palm	Wodyetia bifurcata	25	257.1	38.6	295.7	147.8	542.0	487.8	0.07
16	Neem	Azadirachta indica	50	1328.4	199.3	1527.6	763.8	2800.1	2800.1	0.38
17	Nerium	Nerium Oleander	59	1921.8	288.3	2210.0	1105.0	4051.0	4051.0	0.55
18	Yellow flame	Peltophorum pterocarpum	70	2796.4	419.5	3215.8	1607.9	5894.7	2947.3	0.40
19	Peacock Flower	Caesalpinia pulcherrima	15	66.2	9.9	76.2	38.1	139.6	69.8	0.01
20	Insulin Plant	Costus igneus	15	66.2	9.9	76.2	38.1	139.6	139.6	0.02
21	Golden duranta	Duranta erecta	35	583.8	87.6	671.3	335.7	1230.6	1230.6	0.17
22	Aloe	Aloe vera	90	4807.5	721.1	5528.7	2764.3	10134.0	10134.0	1.38
23	Cactus	Opuntia	10	21.7	3.3	24.9	12.5	45.7	45.7	0.01
24	Butterfly Pea	Clitoria ternatea	50	1328.4	199.3	1527.6	763.8	2800.1	2800.1	1.15
25	Hairy Stem Spiderwort	Tradescantia fluminensis	40	798.0	119.7	917.7	458.9	1682.2	841.1	0.11



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Sr. no.	Tree Name	Botanical Name	Average Diameter cm (10 to 100)	AGB	BGB	Total	Carbon Storage	Amount of CO ₂ Sequestered	Total Amount of CO ₂ Sequestered	Annually CO ₂ Sequestered amount (Ton/year)
26	4'o clock plant	Mirabilis jalapa	100	6016.8	902.5	6919.3	3459.6	12683.1	253661	3.46
27	Weeping Bottlebrush	Melaleucaviminalis		34.5	5.2	39.6	19.8	72.7	363	0.00
28	West Indian Holly	LeeaCoccinea	15	66.2	9.9	76.2	38.1	139.6	1396	0.02
29	Weeping fig	Ficusbenjamina	25	257.1	38.6	295.7	147.8	542.0	4878	0.07
30	Garden croton	Codiaeumvariegatum	50	1328.4	199.3	1527.6	763.8	2800.1	28001	0.38
31	Chinese fan palm	Livistonachinensis	59	1921.8	288.3	2210.0	1105.0	4051.0	40510	0.55
32	Cabbage palm	Cordylinefruticosa	70	2796.4	419.5	3215.8	1607.9	5894.7	29473	0.40
33	Arrowhead vine	Syngoniumpodophyllum	15	66.2	9.9	76.2	38.1	139.6	698	0.01
34	Indian acalypha	Acalyphaindica	15	66.2	9.9	76.2	38.1	139.6	1396	0.02
Total										15.61

Observation:

College has 5318 trees in the campus. There are total CO₂ sequestered 331.19 Tons /Year.



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Table 3.7: Total CO₂ Emission by the College

Sr. No.	CO ₂ (Emission & Neutralized) Sources	CO ₂ Emission Ton/year(2024-25)
1	Electricity	92.01
2	CO ₂ Emission Neutralized by Tree	15.61
3	Net CO ₂ Emission of the college	76.4

Observation:

- Net CO₂ Emission of the college is 76.4 Ton CO₂/year

3.7 Other Emissions Excluded

This study did not evaluate the carbon sequestration potential of existing from the staff commuting, food supply, official flights, paper products, water supply, and waste disposal and recycling due to limited data availability. The current study identifies areas where data monitoring, recording and archiving need to be developed for enlarging the scope of mapping of GHGs emission in the future years. Accordingly, a set of tools and record keeping procedure will be developed for improving the quality of data collection for the next year carbon foot print studies.



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CHAPTER- 4
WASTE MANAGEMENT

4.1 About Waste

Human activities create waste, and it is the way these wastes are handled, stored, collected and disposed of, which can pose risks to the environment and to public health. Waste management is important for an eco-friendly campus. In College different types of wastes are generated, its collection and management are very challenging.

Solid waste can be divided into three categories: bio-degradable, non-biodegradable and hazardous waste. A bio-degradable waste includes food wastes, canteen waste, wastes from toilets etc. Non-biodegradable wastes include what is usually thrown away in homes and schools such as plastic, tins and glass bottles etc. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals, acids and petrol.

Unscientific management of these wastes such as dumping in pits or burning them may cause harmful discharge of contaminants into soil and water supplies, and produce greenhouse gases contributing to global climate change respectively. Special attention should be given to the handling and management of hazardous waste generated in the College. Bio-degradable waste can be effectively utilized for energy generation purposes through anaerobic digestion or can be converted to fertilizer by composting technology. Non-biodegradable waste can be utilized through recycling and reuse. Thus, the minimization of solid waste is essential to a sustainable College. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems

Table 4.1 Different types of waste generated in the College Campus.

Sr. No.	Types of Waste	Particulars
1	Solid wastes	Damaged furniture, paper waste, paper plates, food wastes etc
2	Plastic waste	Pen, Refill, Plastic water bottles and other plastic containers, wrappers etc
3	E-Waste	Computers, electrical and electronic parts etc
4	Glass waste	Broken glass wares from the labs etc
5	Chemical Waste	Laboratory Waste etc
6	Bio-Medical Waste	Sanitary Napkin



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4.2 Waste Management Practices adopted by the College

The audit team visited various departments, classrooms, and other areas to identify waste generation points and waste collection areas for potential improvement. Detailed information is provided in the table. At present college adopt 2 dustbin systems. **It's appreciable.**

College is implemented "Three dust Bin" waste collection system. All kind of waste generated from various activity is collected.



Recommendation:

It is recommended adopted 5 Bin Waste Collection System for collect different type of waste generated in college premises.

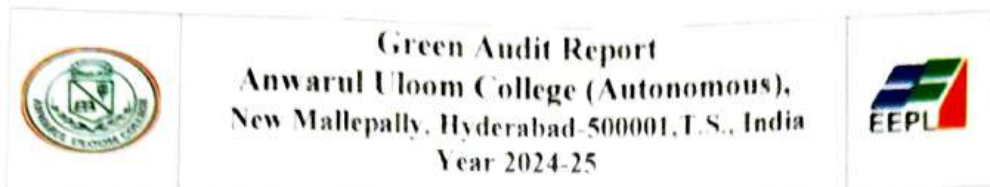


Figure 4.2: Recommended 5 Dust Bin waste collection System

4.3 Some plantation by Anwarul Uloom College, Hyderabad



Fig.4.3 some plantation by AnwarulUloom College, Hyderabad



CHAPTER- 5 QR CODE SYSTEM

5.1 QR Code System

While the world seems to be going digital, people lack the time to read books and process the information they contain. Hence, College can be provided QR codes on the trees for its information and to exploit the rapidly growing platform for a unique purpose.

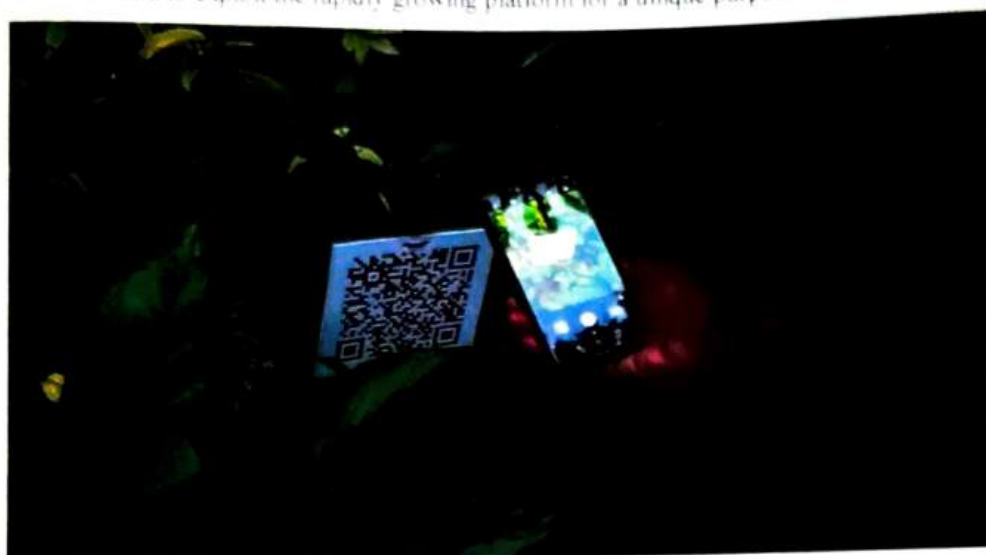


Fig: 5.1 QR Code System for plants

These codes can give students all the information they need to know about the tree from its scientific name to its medicinal value. They only need to put their smart-phones to use QR codes to them, making it easier for everybody to learn about a plant or a tree at the tip of their fingers.” If any app generating a QR code, which is available for free on the online stores, can be used to avail the information of the trees.

Eco-restoration programme

- Frame long-term eco-restoration programme for replacing exotic Acacia plantations with indigenous trees and need of the hour is to frame a holistic campus development plan.





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5.2 Other Suggestions

Some of the very important suggestions are

- ✿ Adopt the proposed Environmentally Responsible Purchasing Policy, and work towards creating and implementing a strategy to reduce the environmental impact of its purchasing decisions.
- ✿ Increase recycling education on campus.
- ✿ Increase Awareness of Environmentally Sustainable Development in College campus.
- ✿ Practice Institutional Ecology- Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.
- ✿ Involve All Stakeholders- Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in environmentally sustainable development.
- ✿ Collaborate for Interdisciplinary Approaches- To develop interdisciplinary approaches to curricula, research initiatives, operations, and outreach activities that support an environmentally sustainable future.
- ✿ Increase reduces, reuse, and recycle education on campus.
- ✿ Develop a butterfly garden that arouses appreciation towards flora and fauna diversity.
- ✿ Name all the trees and plants (Plant DNA barcodes) with its common name and scientific name.
- ✿ Arrange training programme on environmental management system and nature conservation.
- ✿ Renovation of cooking system in the canteen to save gas by installation solar water heater system with heat pump.
- ✿ Establish a procurement policy that is energy saving and eco-friendly.

	Green Audit Report Anwarul Uloom College (Autonomous), New Mallepally, Hyderabad-500001, T.S., India Year 2024-25	
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ANNEXURE -1

Recommendation for Herbal & medicinal plants

S.No.	Hindi Name	Botanical Name	Family
1	Asopalav	Polyalthialongifolia	Annonaceae
2	Gudhal	Hibiscus-rosa-sinensis	Malvaceae
3	Nandee	FicusBenjamina	Moraceae
4	Bahera	TerminaliaBellirica	Combretaceae
5	Khirni	Manilkarahexandra	Sapotaceae
6	Kaner	Neriumindicum	Apocynaceae
7	Champa	Plumeria fragrance	Apocynaceae
8	Peepal	Ficusreligiosa	Moraceae
9	Jackfruit	Artocarpusheterophyllus	Moraceae
10	Amla	Emblicaoofficinalis	Euphorbiaceae
11	Bael	Aeglemarmelos	Rutaceae
12	Amrood	Psidiumguajava	Myrtaceae
13	Ghratkumari	Aloe barbadensis	Liliaceae
14	Nimbu	Citrus lemon	Rutaceae
15	Mogra	Jasminumsambac	Oleaceae
16	Parijaat	Nyctanthes arbor-tristis	Oleaceae
17	Aam	Mangiferaindica	Anacardiaceae
18	Peelakaner	Thevetianerifolia	Apocynaceae
19	Jaamun	Syzugiumcumini	Myrtaceae



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20	Kachnar	Bauhinia variegata	Fabaceae
21	Ratanjot	Jatropha curcas	Euphorbiaceae
22	Shewt ark	Calotropis procera	Asclepiadaceae
23	Drumstick	Moringa oleifera	Moringaceae
24	Neem	Azadirachta indica	Meliaceae
25	Arandi	Ricinus communis	Euphorbiaceae
26	Arjuna	Terminalia arjuna	Combretaceae
27	Putranjiva	Putranjiva roxburghii	Putranjivaceae
28	Anjeer	Ficus carica	Moraceae
29	Shikakai	Acacia concina	Fabaceae
30	Pilaamaltas	Cassia glauca	Fabaceae
31	Nirgundi	Vitex negundo	Lamiaceae
32	Sheesham	Dalbergia sissoo	Fabaceae
33	Dhawda/ Gumghatti	Anogeissus latifolia	Combretaceae
34	Paras peepal	Thespesia populina	Malvaceae
35	Kanakchampa	Pterospermum acerifolium	Malvaceae
36	Maulshree	Mimusops alengi	Sapotaceae
37	Tendu	Diospyros melanoxylon	Ebanaceae



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SAVE ENERGY

SAVE ENVIRONMENT

**END OF THE REPORT
THANKS**



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ENERGY AUDIT REPORT



Anwarul Uloom College (Autonomous)

**11-3-918, New Mallepally, Hyderabad,
Telangana-500 001**

PREPARED BY

EMPIRICAL EXERGY PRIVATE LIMITED

Flat No. 201, OM Apartment, 214 Indrapuri Colony, Bhawarkuan,

Indore – 452 001 (M P), India 0731-4948831, 7869327256

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(2024-25)



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ACKNOWLEDGEMENT

Empirical Exergy Private Limited (EEPL), Indore takes this opportunity to appreciate & thank the management of Anwarul Uloom College (Autonomous), New Malleshpally, Hyderabad-500001, T.S., India for giving us an opportunity to conduct energy audit for the College. We are indeed touched by the helpful attitude and co-operation of all faculties and technical staff, who rendered their valuable assistance and co-operation the course of study.

For- Empirical Exergy Private Limited

Rajesh Kumar Singhadiya

(Director)

M.Tech (Energy Management),
Accredited Energy Auditor [AEA-0284]
Certified Energy Auditor [CEA-7271]
(BEE, Ministry of Power, Govt. of India)
Empanelled Energy Auditor with MPUVN, Bhopal MP
Lead Auditor ISO50001:2011 [EnMS] from FICCI, Delhi
Chartered Engineer [M-1699118],
The Institution of Engineers (India)
Member of ISHRAE [58150]



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CERTIFICATE OF ACCREDITATION



BUREAU OF ENERGY EFFICIENCY



Examination Registration No.: **EA- 7271**

Accreditation Registration No.: **AEA-284**

Certificate of Accreditation

This is to certify that Mr./Ms. **Shri. Rajesh Kumar Singadiya** having its trade/registered office at has been given accreditation as accredited energy auditor. The certificate shall be effective from **9th** day of **May, 2018**.


The certificate is subject to the provisions of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

This certificate shall be valid until it is cancelled under regulation 9 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

On cancellation, the certificate of accreditation shall be surrendered to the Bureau within fifteen days from the date of receipt of order of cancellation.

Your name has been entered at AEA No. **284** in the register of list of accredited energy auditors. Your name shall be liable to be struck out on the grounds specified in regulation 8 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

Given under the seal of the Bureau of Energy Efficiency, Ministry of Power, this **5th** day of **October, 2018**


Secretary,
Bureau of Energy Efficiency
New Delhi



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ENERGY AUDIT TEAM

The audit team constituted by the following senior technical executives from the Empirical Exergy Private Limited,

Sr. No.	Name of Audit Team	Designation	Qualifications	Experience (Years)	Specialization
1	Mr. Rajesh Kumar Singadiya	Director & Accredited Energy Auditor AEA-0284	M. Tech in Energy Management	20	Energy Audit & Safety Audit
2	Mr. Rakesh Pathak	Director & "A" Class Electrical Contractor	Diploma in Electrical Engineer	35	Electrical Audit & Electrical operation & Maintenance
3	Ms. Laxmi Raikwar Singadiya	Sr. Project Manager and report reviewer	M. Tech in Energy Management	15	Energy, Environment, Green Audit
4	Mr. Charchit Pathak	Sr. Project Engineer	B. Tech in Mechanical Engineering, MBA in Human Resource Management	5	Energy Audit, Green Audit, Safety Audit



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**GREEN, ENERGY AND ENVIRONMENT
MONITORING COMMITTEE**



Anwarul Uloom College (Autonomous)
(Affiliated to Osmania University)
Accredited with 'A+' Grade by NAAC
New Mallepally, Hyderabad- 500001, T.S., India.



Date: June 13, 2025

OFFICE ORDER

The Energy Monitoring Committee of Anwarul Uloom College (Autonomous) is reconstituted as follows:

1. Mr. Mohammed Gouse, Senior Electrician
2. Mr. Mohd. Haseeb Ali, Accountant
3. Mr. T. Hemanth Kumar, Asst. Prof., Dept. of Commerce

The term of the members shall be two years.


Director

Copy to:
All concerned.



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EXECUTIVE SUMMARY

The executive summary of the energy audit report presented in this section briefly outlines the identified energy conservation measures and recommendations proposed during the project. These energy conservation measures can be implemented in phases to conserve energy and enhance productivity within the Anwarul Uloom College, 11-3-918, New Mallepally, Hyderabad (Telangana) campus.

AREAS OF IMPROVEMENT

LIGHTING SYSTEM

Replacement of “conventional T-12 (40 Watt) and T-8 (36 Watt)” tube light by energy efficient LED lighting fixture was taken up phased manner.

TIMER CONTROLLED STREET LIGHTS

Installation of “Timer control on high mast and street lighting” in College campus is recommended.

CEILING FAN AND EXHAUST FAN

Replacement of “conventional ceiling fan (60 Watt to 80 Watt)” by energy efficient star rated fan or BLDC based energy efficient fan (20 to 25 Watt) in “admin building, class rooms, laboratories and faculties cabin” have great potential for energy saving.

Replacement of “conventional exhaust fan (90 Watt to 125Watt)” by energy efficient star rated fan or BLDC based energy efficient Fan (20 to 40 Watt) in old building class rooms, laboratories and faculties cabin have great potential for energy saving.

IOT BASED ENERGY MONITORING SYSTEM AT MAIN FEEDER

- Installation of “Cloud based (IoT based) energy monitoring system” including harmonic measurement (total voltage and current harmonic distortion %) in power house will be good initiate for energy monitoring as well as student demo project for management. Expected energy saving potential about 2 to 4%.
- Installation of energy meters between transformer and main PCC panel with IOT system will monitor line losses of the system. It will give real time measurement of power factor and line losses from the cable.



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✦ **TRANSFORMER LOSS OPTIMIZATION**

- Replacement of “existing conventional sub-station by new compact type substation” in HT yard is highly recommended to management to develop “Demo Project” in college will be technology up gradation as well as learning center for student and faculties.
- Replacement of existing transformer by “Energy efficient star rated transformer by BEE, Government of India or energy efficiency level-3” can be good project for management for energy saving as well as learning center for student and faculties.

✦ **SYNCHRONIZATION OF DG SET WITH SOLAR SYSTEM**

- Installation of “Cloud based fuel and unit generation monitoring system” in DG set will help to monitor specific unit generation by DG set failure of the grid power.
- It was observed that during the power failure of the grid, solar unit generations also stop. Synchronization of the solar system with DG set increases the utilization capacity of the solar system.

✦ **ENERGY MANAGEMENT WORKSHOP AND TRAINING**

- Develop energy management policies for college. Establish a procurement policy that is energy saving and eco-friendly.
- Involve All Stakeholders- Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in energy management system.



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Chapter-1
INTRODUCTION

1.1 About College

Anwarul Uloom College was established in August 1953 by the Anwarul Uloom Educational Association. Located in the heart of the city, the college is a prominent institution in Hyderabad. It was granted permanent affiliation by Osmania University in 1960 and recognized under Section 12f 2b of the UGC Act, 1956. In the academic year 1988-89, the institution was conferred first time autonomous status, which it continues to enjoying and in August 2023 UGC granted 10 years of autonomy to the college. Demonstrating its commitment to quality, the college was accredited with an A+ Grade by NAAC in 2023, becoming the first Muslim Minority Institution in Telangana to receive this recognition. The college is also certified with ISO 9001:2015 standards and actively participated in NIRF ranking and submit data to the AISHE on regular basis.

Institutional Overview:

- Student Strength: 5824 approx.
- Undergraduate Programs: 24
- Postgraduate Programs: 8
- Campus Area: 3 acres
- Number of Blocks: 8
- Classrooms: 83 (50% are Smart Classes)

The college operates with a dynamic and experienced faculty. There is the student teacher ratio 25:1. The institution has maintained a student-centric approach, enhancing academic standards, research, and infrastructural growth.



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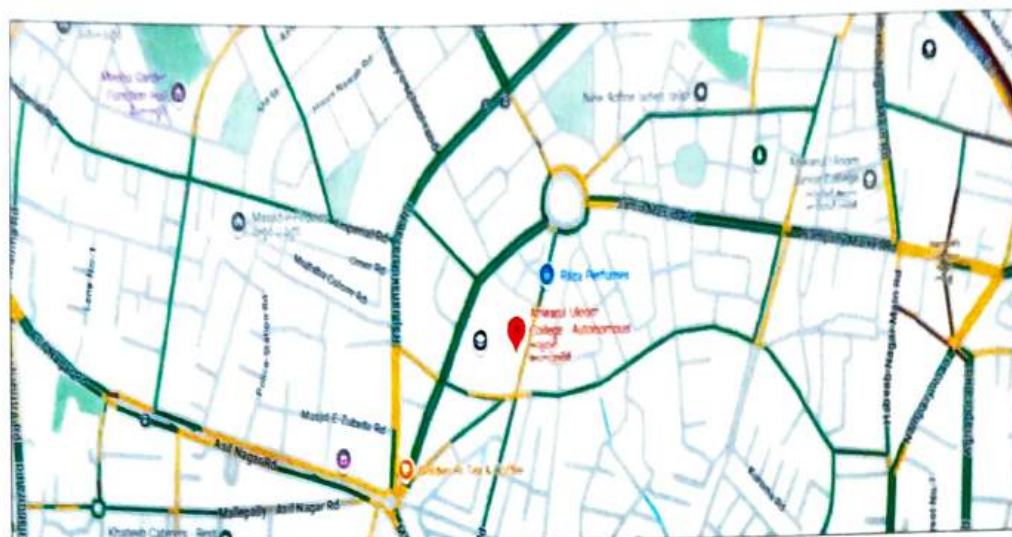




Fig. 1.1-Source: Satellite Image of Anwarul Uloom College, Hyderabad T.S.

Management of the College:

Anwarul Uloom College functions under the aegis of the Anwarul Uloom Educational Association. Hon. Secretary, Nawab Mehboob Alam Khan's leadership reflects a combination of experience, knowledge, and dynamism. His vision has acted as a catalyst for institutional growth, program expansion, and infrastructural development.

	<p style="text-align: center;">Energy Audit Report Anwarul Uloom College (Autonomous), New Mallepally, Hyderabad-500001, T.S., India Year 2024-25</p>	
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Vision

To provide skill-based quality higher education by striving continuously for excellence in educational service to all sections of the society especially the minority students who are socially, economically and academically under privileged with the focus on empowerment of youth to contribute constructively towards the national goals by upholding the values of secularism, national integration and social commitment.

Mission:

To provide higher education for empowerment of youth of Telangana state especially the marginalized people has been the main thrust of this college. The institution is committed to the under-privileged of the society and students with high potential facing difficult socio-economic circumstances, so as to bring them at par with mainstream. Our mission is to impart quality education and exposure for the holistic development of students and equip them to cope with the latest requirements, through innovative techniques and practices.



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Programmes Offered in the College

1. B.B.A.
2. B.B.A. (AI and Data Science)
3. B.B.M
4. B.Com. General
5. B.Com. Computer Application
6. B.Com.E.Com.
7. B.Com. Advertising, Sales Mgt., & Sales Promotion
8. B.Com. Business Process Mgt.
9. B.Com. Foreign Trade
10. B.Sc. MPC (Maths, Physics & Chemistry)
11. B.Sc. BZC (Botany, Zoology & Chemistry)
12. B.Sc. MECs (Maths, Electronics & Computer Science)
13. B.Sc. MPCs (Maths, Physics & Computer Science)
14. B.Sc. CS Engg. (Computer Science & Engineering)
15. B.Sc. NZC (Nutrition, Zoology & Chemistry)
16. B.Sc. Food Science
17. B.Sc. Animation
18. B.Sc. Data Science
19. B.Sc. Artificial Intelligence and Machine Learning
20. B.Sc. BMC (Bio-Technology, Micro Biology & Chemistry)
21. B.Sc. Hons. Biomedical Sciences
22. B.A. EPP E/M
23. B.A. HPML U/M
24. B.A. EHHP



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PG Programmes:

1. M.A. English
2. M.Com. (Finance)
3. M.Sc. Botany
4. M.Sc. Chemistry
5. M.Sc. Mathematics
6. M.Sc. Bio-Technology
7. M.Sc. Nutrition & Dietetics
8. M.Sc. Microbiology

PG Diploma, Diploma and Certificate Courses

1. PG Diploma in Nutrition & Dietetics
2. Diploma in Communicative English and Soft Skills
3. Diploma Course in Arabic Translation.
4. Diploma Course in Arabic DTP
5. Diploma in Medical Lab Technology (DMLT)
6. Certificate Course in Communicative English and Soft Skills
7. Certificate Course in Communicative English and Interpersonal skills
8. Certificate in Tajweed ul Quran
9. Certificate Course in Urdu DTP
10. Certificate Course in Phyto chemistry
11. Certificate Course in Analytical Techniques in Chemistry



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About College Campus

The college Infrastructure Facilities

- Campus Area: 3 acres
- Number of Blocks:8
- Departments: 23
- Classrooms: 83 (50 Smart Classes)
- Wi-Fi-enabled Campus





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1.2 About Energy Audit

An energy audit serves to enhance understanding about how energy is utilized within the college, aiding in the identification of areas susceptible to waste and potential areas for improvement. The overall energy efficiency, from generation to the end consumer, stands at 50%. Therefore, conserving one unit by the end user is equivalent to two units produced at the power plant.

An energy audit represents the most effective approach to discerning the strengths and weaknesses of energy management practices, while also offering solutions to existing issues. It embodies a professional means of responsible utilization of economic, financial, social, and natural resources. Energy audits contribute value to management control and serve as an evaluative method for systems.

Empirical Exergy Private Limited (EEPL), Indore, Madhya Pradesh, conducted an "Energy Audit" on-site to identify gaps in the energy consumption pattern at **Anwarul Uloom College, Hyderabad**. A technical report has been prepared in accordance with the requirements of the institute.

1.3 Objectives of Energy Auditing

Energy auditing provides a critical information foundation for an all-encompassing energy conservation initiative, encompassing energy utilization analysis and the evaluation of energy-saving measures.

Its objectives include:

- ✚ Identifying the cost and quality of different energy inputs
- ✚ Evaluating the current energy consumption patterns across various operational cost centers
- ✚ Establishing connections between energy inputs and production outputs.
- ✚ Identifying potential areas for thermal and electrical energy conservation.
- ✚ Pinpointing areas of major wastage.
- ✚ Setting energy-saving targets for individual cost centers.
- ✚ Implementing measures for energy conservation and realizing savings.



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1.4 Methodology

The methodology employed to achieve the designated objectives, encompassing the assessment of current operational status and potential energy savings, encompasses the following steps:

- ✦ Engaging in discussions with relevant officials to identify key areas of focus and related systems.
- ✦ Sending a team of engineers to the site for discussions with concerned officials and supervisors, aiming to gather data and information regarding plant operations and load distribution across the premises. The collected data were analyzed to establish a baseline energy consumption pattern.
- ✦ Utilizing suitable instruments for measurements and monitoring, including continuous and/or time-lapse recording as appropriate, coupled with visual observations to discern energy usage patterns and system losses.
- ✦ Conducting trend analysis for costs and consumption patterns.
- ✦ Carrying out capacity and efficiency tests on major utility equipment, wherever applicable.
- ✦ Estimating various forms of losses.
- ✦ Performing computations and in-depth analysis of the gathered data, utilizing computerized analysis and relevant techniques where appropriate, to derive conclusions and formulate an effective energy conservation plan to enhance and reduce specific energy consumption.

1.5 Present Energy Scenario

The college acquires energy in the form of electricity procured from the TSSPDCL grid. The total billing amount is 15,69,931/- reflecting an annual energy consumption of 1,03,567(kWh) units, with an overall per-unit charge of Rs. 15.48/- per unit during the period from Mar 2024 to Apr 2025.

CHAPTER-2

POWER SUPPLY SYSTEM

2.1 Power Supply System

The college's power supply primarily derives from the grid. In the event of grid power failure, an emergency power supply is provided by a DG set.

Grid Power

The college acquires energy in the form of electricity procured from the TSSPDCL grid. The total billing amount is Rs. 15,69,931/- reflecting an annual energy consumption of 1,03,567 units, with an overall per-unit charge of Rs. 15.48/- per unit during the period from Apr 2024 to Mar 2025.

DG Set

A DG set is utilized in instances of grid power failure.

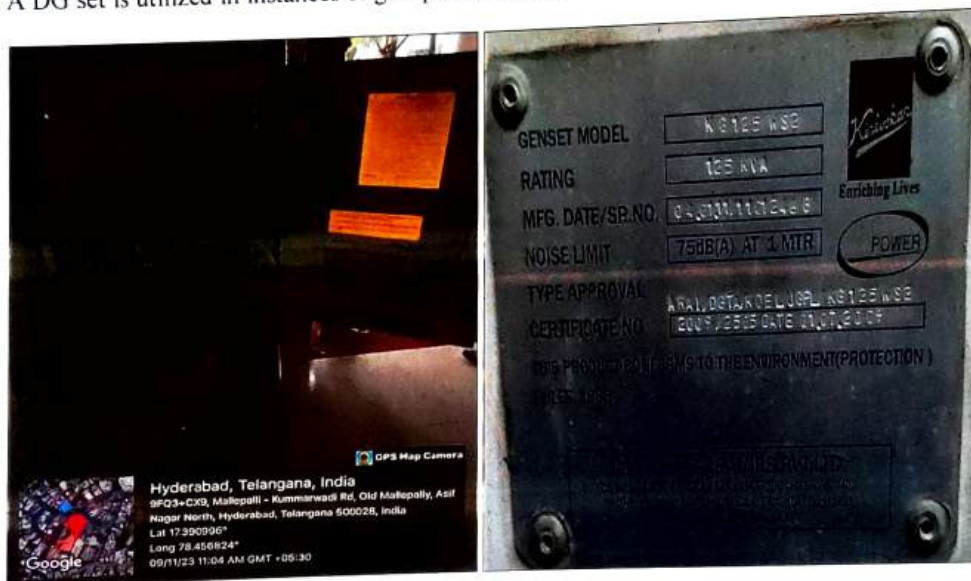


Figure 2.1:- Transformer on the college campus



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2.2 DG Set

A single DG set is present on the college campus. The technical specifications for the DG set are provided in the following table (Table 2.1)

Table 2.1: Technical Specifications for DG Set

Sr. No	Parameter	Technical Specification
1	Make	Jackson Limited
2	Capacity (KVA)	125
3	Phase	3
4	Power Factor	0.8



Figure 2.2:- DG set on the college campus

Observation

DG set is used only in case of power failure.



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CHAPTER-3
ELECTRICITY BILL ANALYSIS

3.1 Monthly Energy Consumption (Year 2024-25)

The table 3.1 shows the monthly energy consumption (in kWh) for four consecutive years of the college.

Table 3.1: Monthly Energy Consumption Year 2024-25

Sr. No.	Month & Year	Total Unit Consumption (kWh)	Total Amount (Rs./-)	Overall per unit Charges (Rs./kWh)
1	Apr-24	7363	104853	14.24
2	May-24	9805	130360	13.30
3	Jun-24	8857	144721	16.34
4	Jul-24	11508	0	0.00
5	Aug-24	11185	329520	29.46
6	Sep-24	8533	131667	15.43
7	Oct-24	8943	132154	14.78
8	Nov-24	9720	138965	14.30
9	Dec-24	8217	126853	15.44
10	Jan-25	5053	115454	22.85
11	Feb-25	6568	84328	12.84
12	Mar-25	7815	131056	16.77
		103567	1569931	15.48

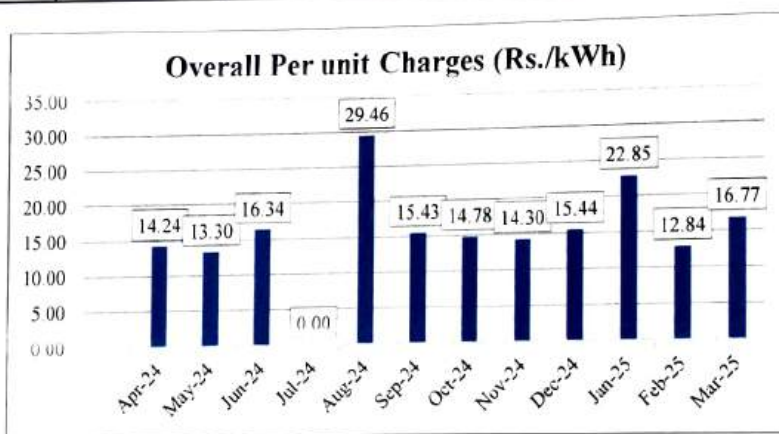


Figure 3.1 Graphical presentation of overall per unit charge for the year 2024-25



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Observations

The energy consumption for the year 2024-25 is 95,718 unit.

Table 3.2: Monthly Power Factor Year 2024-25

Sr. No.	Month & Year	Power Factor
1	Apr-24	1
2	May-24	1
3	Jun-24	1
4	Jul-24	1
5	Aug-24	1
6	Sep-24	1
7	Oct-24	1
8	Nov-24	1
9	Dec-24	1
10	Jan-25	1
11	Feb-25	1
12	Mar-25	1
Average		1

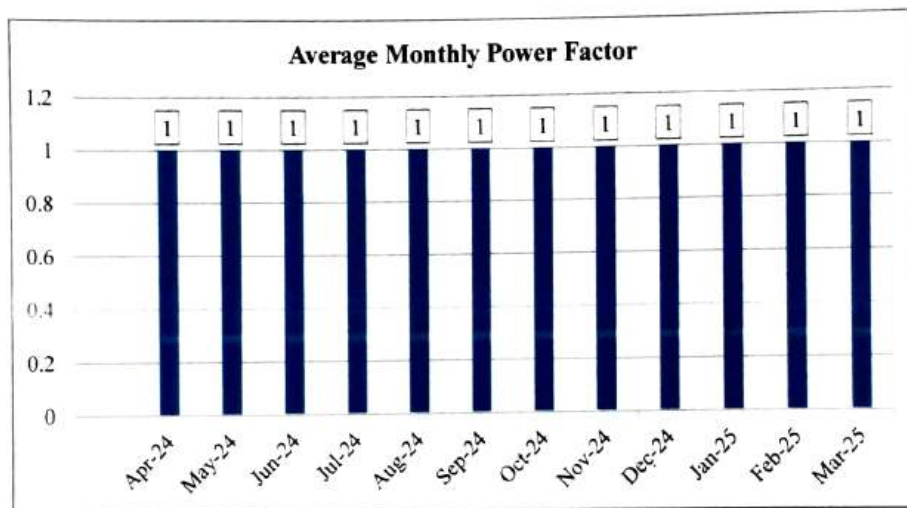


Fig.3.2. Monthly Power Factor for the year 2024- 2025

Observation

The average power factor was 1 for the year 2024-25. It's appreciable.



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CHAPTER-4
CONNECTED LOAD ANALYSIS

4.1 Connected load details of the college

During the energy audit details of the electrical appliances has been verified in the college.

Table 4.1: Total Connected Major Running Load of College

Sr. No.	Name of Block	Connected Load (kW)
1	Degree Block	45
2	PG Block	20
	Total	65

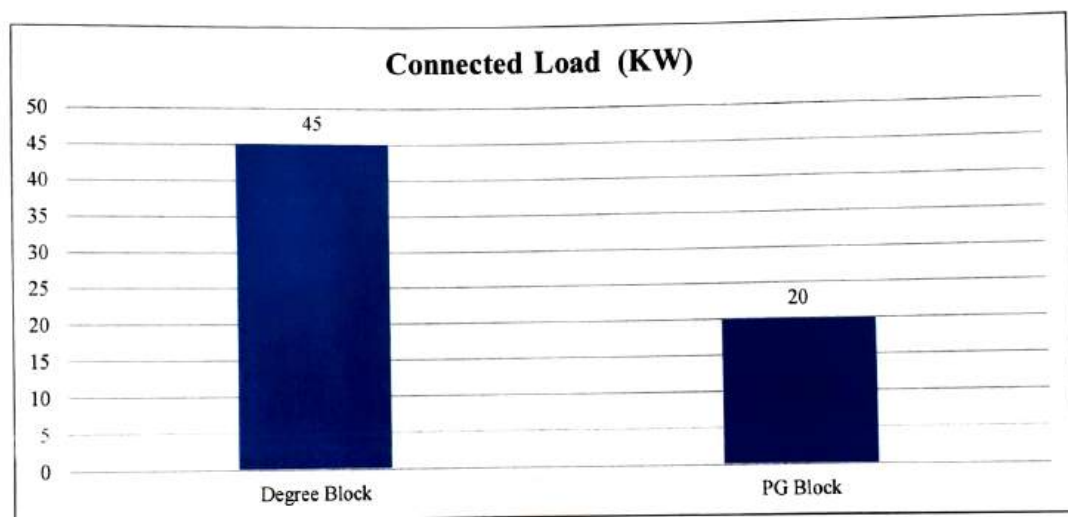


Fig.4.1: Connected load of Blocks on College

Observation

The connected load of college is 65 kW.



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4.2 Some Photographs of Electrical Equipment



LED Street light



PC



LED tube light(18W)



Ceiling Fan(60W)



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AC (Air Conditioner)



Printer



LED Street light



LED tube light(18W)



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CHAPTER-5
ENERGY CONSERVATION MEASURES

5.1 Case Study

Lighting

- ✦ Switch off lights when absent from your work area for more than 30 minutes including in bathrooms, meeting rooms, lecture theatres and corridors.
- ✦ Maximize the use of natural light and turn on lights only when there is inadequate lighting. Promote LED lamps instead of incandescent bulbs.
- ✦ Promote electronic chokes for florescent lamps instead of EMT chokes.

5.2 Case Study

Installation of IoT based Energy Monitoring System (EMS)

Observation

- ✦ During the energy audit it was observed that at present daily energy monitoring by manually.

Recommendation

- ✦ Installation of cloud-based energy monitoring system in present system play great roll to Generated data based for energy consumption in the system. The result of the system will be reflecting in terms of long-term energy saving project



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5.3 Case Study

Computer and Monitors

- ✚ Online UPS – Battery Status Indication. It can be switched-off during non-use period. To minimize no-load power consumption.
- ✚ Advice on PC energy saving features like advanced LED monitor.
- ✚ Switch-off the Offline UPS. When the power failure is less. Improves life of SMF Batteries. Over charging will leads to bulging of batteries and leads to battery failure.
- ✚ Adjust your power management settings to put your screen to sleep if it is not in use for more than five minute

5.4 Case Study

Air Conditioning System

Recommendation

- ✚ It is recommended to replaced Sprit AC by BEE star rated AC
- ✚ It is recommended “Fall Ceiling “in air conditioning area. It will be reduced air conditioning load of AC and unit consumption.
- ✚ According to studies, for every one degree we raise the temperature of AC to, up to 6% electricity can be saved, So far, the default temperature for AC’s in India was 20 or 21 Degrees. Thus by increasing it to 24 degree you hare savings 18 to 20 % electricity- It is simple Math.
- ✚ Reduced the infiltration from door and window in air conditioning area
- ✚ Keep doors and windows closed in air-conditioned space, particularly doors leading to stairwells and external areas.
- ✚ Avoid Usage of Air-conditioners in the evening hours & favorable climate conditions.
- ✚ Use pedestal fan instead of air-conditioners during non-laboratory hours.
- ✚ Routine maintenance for air filters& cooling pins to make proper operation at regular interval.
- ✚ Use air curtains in front of door to avoid false air entry.



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SAVE ENERGY

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END OF THE REPORT
THANKS