

# **Green, Environment & Energy Audit Report**

**ASSAM DOWN TOWN UNIVERSIT**

Assam down town University, Sankar Madhab Path, Gandhi Nagar.  
Panikhaiti, Guwahati, Assam, 781026



|                             |                                                           |
|-----------------------------|-----------------------------------------------------------|
| <b>Name of University</b>   | <b>ADTU.</b>                                              |
| <b>Areas Covered</b>        | <b>55 Acres.</b>                                          |
| <b>Audit Period</b>         | <b>DAY 1</b>                                              |
| <b>Date of Audit</b>        | <b>1<sup>st</sup> Nov-2025</b>                            |
| <b>Audited for the year</b> | <b>2024-2025.</b>                                         |
| <b>Name of Auditors</b>     | <b>Mr. Saravana Kumar.<br/>Mr. Arthanari.</b>             |
| <b>Report Prepared by</b>   | <b>Mr. Arthanari.</b>                                     |
| <b>Report Approved by</b>   | <b>Mr. Saravana Kumar</b>                                 |
| <b>Audit conducted by</b>   | <b>Glocert Certification India P Ltd.<br/>Coimbatore.</b> |

## Table of Contents

|                                                  |    |
|--------------------------------------------------|----|
| Table of Contents                                | 3  |
| Green Campus audit certificate                   | 5  |
| Energy audit certificate                         | 6  |
| Environment audit certificate                    | 7  |
| Introduction to Green Audit                      | 8  |
| Purpose of Green Audit                           | 10 |
| Objectives of Green Audit                        | 11 |
| Benefits of Green Audit                          | 12 |
| Scope of the Audit Process                       | 14 |
| Audit Approach                                   | 15 |
| Overview of university                           | 16 |
| Vision & Mission                                 | 18 |
| Committee Details                                | 19 |
| Facilities Available                             | 20 |
| General Information                              | 21 |
| Green Audit                                      | 24 |
| Greenery Campus                                  | 25 |
| Recommendation                                   | 29 |
| Energy Audit                                     | 30 |
| Energy Consumption Data                          | 32 |
| Energy Conservation Recommendation - Ceiling Fan | 33 |
| Diesel Generators                                | 35 |
| Renewable Energy (Solar Panel)                   | 36 |
| Uses of Solar Panel                              | 37 |
| Recommendation                                   | 38 |

|                              |    |
|------------------------------|----|
| Environment Audit _____      | 40 |
| Waste Management _____       | 41 |
| E-Waste Management _____     | 47 |
| Water Management _____       | 48 |
| Water consumption data _____ | 49 |
| Water Quality _____          | 76 |
| Rainwater harvesting _____   | 81 |
| Indoor Air Quality _____     | 57 |
| Recommendation _____         | 60 |
| Best Practices _____         | 61 |
| Criteria wise OFI _____      | 70 |
| Conclusion _____             | 72 |
| Disclaimer _____             | 73 |
| Extra credit 1 _____         | 74 |
| Extra credit 2 _____         | 75 |







## INTRODUCTION OF GREEN AUDIT

Green campus is an area of the organization or the organization as a whole itself is contributing to have an infrastructure or development that is structured and planned to incur less energy, less water, less or pollution free, less or no CO<sub>2</sub> emission. In certain cases, the project zone of green campus can be self-reliable in terms of energy and water consumption and with higher ratings of the project zone they can complement or support in national energy and water needs as a part of the corporate social responsibility. The green campus capitalization may incur some little investment but the vision of green campus is to satisfy the organizational needs by its simple initiatives in a bigger vision to prevent the deterioration of environmental resources.

Green campus audit is a type of assessment to ensure that the Institution and Organization campus is greenish in terms of planting a large number of trees and lawns in the campus. To ensure that the list of plants and animals / birds available in the campus, biodiversity conservation, water irrigation system, recycling of water, rain harvesting system, site preservation, soil erosion control and landscape management will be evaluated. To ensure that the campus should be greenish in terms of planting a large number of herbs, shrubs and trees including lawns which in turn to reduce the environmental pollution, proper water irrigation system, natural topography or vegetation, biodiversity conservation, etc. implemented effectively for the benefit of the stakeholders.

Importance of Green Audits: Helps university become more eco-friendly and sustainable

- Supports environmental conservation and resource management
- Enhances reputation and leadership in environmental stewardship
- Contributes to a healthier and more sustainable campus environment.

As environmental sustainability gains increasing importance nationwide, higher educational institutions are playing a pivotal role in promoting sustainable development through initiatives like Green Campus systems. These initiatives not only contribute to sustainable development but also significantly reduce atmospheric carbon dioxide levels.

Green Audit is mandated by Criterion 7 of NAAC (National Assessment and Accreditation Council), a leading accrediting body in India. It requires all Higher Educational Institutions to submit an annual Green Audit Report as part of their accreditation process. This mandate reflects the institutions' social responsibility to mitigate global warming through measures aimed at reducing their carbon footprint.

Green auditing is a vital process that ensures campus biodiversity, reduces ecological pollution, and preserves soil integrity. It encompasses practices such as biodiversity protection, landscape management, efficient water use, and preservation of natural topography.

Green Audits are crucial for university and educational institutes to achieve higher accreditation scores from NAAC. They play a critical role in biodiversity conservation and sustainable campus management, contributing positively to environmental stewardship and institutional sustainability efforts.

### **Green Audit Procedure**

- Evaluates environmental performance against established policies and objectives
- Examines energy efficiency, waste management, water consumption, and resource usage
- Identifies areas for improvement and opportunities for cost savings
- Provides a framework for implementing sustainable practices and reducing environmental impacts

## **Purpose of Green Audit**

A green audit in a university serves

1. **Environmental assessment:** Identifies areas of environmental impact, such as energy consumption, water usage, waste management, and pollution.
2. **Sustainability evaluation:** Assesses the university's sustainability performance, including energy efficiency, resource utilization, and eco-friendly practices.
3. **Waste reduction and management:** Helps minimize waste, promotes recycling, and optimizes waste disposal methods.
4. **Energy efficiency and conservation:** Identifies opportunities to reduce energy consumption, promotes energy-efficient practices, and recommends renewable energy sources.
5. **Water conservation:** Assesses water usage, identifies areas for reduction, and promotes water-saving measures.
6. **Green infrastructure development:** Encourages the development of green spaces, gardens, and eco-friendly infrastructure on campus.
7. **Education and awareness:** Raises awareness among students, staff, and faculty about environmental issues, promotes sustainable practices, and integrates environmental education into the curriculum.
8. **Compliance and policy development:** Ensures compliance with environmental regulations, develops and implements environmental policies, and sets sustainability goals.
9. **Cost savings and resource optimization:** Identifies opportunities to reduce costs, optimize resource usage, and allocate resources efficiently.
10. **Enhanced reputation and leadership:** Demonstrates the university's commitment to sustainability, enhancing its reputation and leadership in environmental stewardship.

## Objectives of Green Audit

- Assess the nature and extent of risks to human health and the environment, such as from contaminated land, waste, or pollution.
- Recommend measures to manage and mitigate these risks effectively.
- Assessment and Compliance: Evaluate the institution's compliance with environmental laws, regulations, and internal policies.
- Resource Management: Identify opportunities for more efficient use of resources such as energy, water, and materials.
- Waste Management: Assess waste generation practices and identify strategies for waste reduction, recycling, and proper disposal.
- Environmental Impact: Evaluate the institution's environmental footprint, including emissions, pollution, and natural resource depletion.
- Sustainability Improvement: Develop strategies to improve the institution's sustainability practices and reduce environmental impact.
- Awareness and Education: Raise awareness among stakeholders (students, faculty, staff, and community) about environmental issues and best practices.
- Cost Savings: Identify opportunities for cost savings through improved resource efficiency and waste management practices.
- Health and Safety: Ensure that environmental practices promote health and safety standards for all stakeholders.
- Continuous Improvement: Establish a framework for ongoing monitoring, evaluation, and improvement of environmental performance.
- Compliance and Reporting: Prepare reports and documentation to demonstrate compliance with environmental standards and regulations.
- Stakeholder Engagement: Engage stakeholders in the process of environmental management and decision-making.



## **Benefits of Green Audit**

- More efficient resource management
- Basis for improved sustainability practices
- Creation of a green campus environment
- Facilitation of waste management through waste reduction, solid waste management, and water recycling
- Establishment of a plastic-free campus and promotion of health consciousness among stakeholders
- Identification of cost-saving methods through waste minimization and management practices
- Identification and anticipation of current and future environmental challenges
- Verification of compliance with environmental laws and regulations
- Empowerment of organizations to achieve better environmental performance
- Heightened awareness of environmental guidelines and responsibilities
- Provision of environmental education through systematic environmental management approaches
- Enhancement of environmental standards and benchmarks
- Financial savings through reduced resource use and operational costs
- Development of ownership and fostering personal and social responsibility toward the university environment
- Enhancement of university profile and reputation in sustainability
- Cultivation of environmental ethics and values among students
- Utilization of green auditing as a valuable tool in managing and monitoring environmental and sustainable development programs

- Ensuring legislative compliance
- Reducing environmental impacts
- Lowering waste, water, and energy costs (often exceeding the audit's fees)
- Improving relations with stakeholders
- Enhancing overall environmental performance and fostering a culture of sustainability
- Assisting in achieving certification and accreditation standards related to environmental management.



## **Scope of the Audit Process**

### **Energy Audit:**

- Conduct a detailed energy audit in the university campus with a main focus to identify judicious usage of electrical and thermal energy (where, when, why and how energy is being utilized).
- To ascertain the best practices to be followed in energy conservation, energy management, recommended safety measures and continuous energy monitoring system.

### **Environmental Audit:**

- Identification of history of activities, present environmental practices followed, monitoring records and known sources of environmental issues inside the university.
- Adoption of natural resources as input (such as energy and water), processing and utilization and generation of wastes (including hazardous and toxic),
- Handling and storage of all types of wastes (Solid, liquid and gaseous), transportation of waste from source to yard, reuse and recycling possibilities, storage mechanism and effective disposal.
- Measurement of effectiveness of pollution control (air, water and soil pollution), maintenance logs, emission test reports and routine analytical reports.
- Providing constant awareness to all stakeholders on Environment impacts, risk analysis and Ecology.

### **Green Audit:**

- Assessment on Campus greenery in terms of matured trees, flowering shrubs, bushes, medicinal plants, adoption of green energy generation and utilization, reduction of CO<sub>2</sub> due to green energy system and identification of possible implementation and enhancement of current greenery practices.
- A green audit evaluates how effectively an institution uses natural resources, manages energy, and water, and waste, controls pollution, promotes eco-friendly practices. It is widely used for NAAC, NIRF, ISO, NBA, ESG and Sustainability reporting.

## Audit Approach

- Opening meeting among the audit team and auditees
- Planning and organizing the energy audit
- Conduct a walk-through audit at different sites
- Data collection and observation
- Analysis of data collected.
- Best practices
- Recommendations for further improvement
- Closing meeting after the audit to discuss about the audit findings.



## Overview of University

Assam down town University (AdtU) is the North Eastern leading university offering its students a unique amalgamation of professional and academic excellence and has coupled the experience of top industry leaders and renowned academicians and fosters a worldly approach and the largest educational group based in Assam, has on its rolls 8100+ students and more than 1000+ faculty members. The State-of-the-art campus in Guwahati located on 55 acres of land.

Responding to the urgent and strong need have bring quality education to North Eastern Region of India at affordable cost. down town Charity Trust established a multi- disciplinary university in the year 2010. Assam down town University is located at Panikhaiti, Chandapur in the Assam state capital region, 14 kms away from Dispur.

Area of excellence range from engineering and allied health science to management and nursing to pharmacy. Also unique, inspirational academic model is designed to match the international standards. The curriculum offered is continuously upgraded to keep pace with the overall development of industry and in-line with the best practices with in the best practices followed in international Universities.

With students from 20 Indian States and 5 Countries AdtU is one of the most ethnically and culturally diverse universities in the vicinity of the city beautiful - Guwahati. A continuous emphasis on modern teaching methods, global links for research, students exchange and knowledge sharing, world class infrastructure, placement, diversity of students and industry- institute interactions have consistently place AdtU students well ahead in every field. This dedication to academic excellence has resulted in accolades for the university. Today AdtU is one of the most preferred, highly recognized and top ranked university in North East states.

## OBJECTIVES

A green audit's main objective is to assess an organization's environmental impact, identify resource wastage (water, energy, waste), and develop strategies for sustainability, cost savings, and regulatory compliance, ultimately fostering eco-friendly practices and awareness among stakeholders for a greener campus or operation.

To fulfill the Institution's responsibility towards reducing carbon footprint and contribute to environmental protection. To promote Environmental Consciousness and responsibility among students

To provide its students with opportunities to exhibit their potential in its totality in pursuance of academic studies and other social activities.

To provide conducive environment for learning by doing in university.

To promote the dissemination of knowledge fostering the innovative thoughts of the students.

To organize seminars and lectures of eminent professionals and scientists.

To produce readily employable graduates by imparting industry grade skills.

To indicate the spirit social harmony and solidarity among students and strengthen the unity and integrity of the nation.

To educate and train law students to properly perform their jobs, learn manners, professional ethics and social values.

To perform such other functions and to carry out such other duties as the society may deem proper or as may be assigned to it by the State Government from time to time.

To value and preserve the right heritage of our composite culture.

To prepare our students for updating their office and library.

## Vision & Mission



### OUR VISION

To become a Globally Recognized University from North Eastern Region of India,  
Dedicated to the Holistic Development of Students and Making Society Better.

### OUR MISSIONS

Creation of curricula that address the local, regional, national, and international needs of graduates, providing them with diverse and well-rounded education.  
Build a diverse student body from various socio-economic backgrounds, provide exceptional value-based education, and foster holistic personal development, strong academic careers, and confidence.

Achieve high placement success by offering students skill-based, innovative education and strong industry connections.

Become the premier destination of young people, desirous of becoming future professional leaders through multidisciplinary learning and serving society better.

Create a highly inspiring intellectual environment for exceptional learners, empowering them to aspire to join internationally acclaimed institutions and contribute to global efforts in addressing critical issues, such as sustainable development, climate mitigation and fostering a conflict-free global society.

To be renowned for creating new knowledge through high quality interdisciplinary research for betterment of society.

To be renowned for creating new knowledge through high quality interdisciplinary

research for betterment of society.

Become a key hub for the growth and excellence of AdtU's stakeholders including educators, researchers and innovators.

Adapt to the evolving needs and changing realities of our students and community by incorporating national and global perspectives, while ensuring our actions are in harmony with our foundational values and objectives of serving the community.

## **Core Values**

AdtU operates with the following Core Values

Human Dignity, Empathy and Humility

Academic Integrity, Excellence and Leadership

Interdisciplinary Approaches, Excel in Research, Innovation and Entrepreneurship

Diversity, Inclusivity, and Social Responsibility

Collective, Co-ordinated and Co-operative Endeavors.

## **Committee / Cell Details**

|    |                                      |
|----|--------------------------------------|
| 1  | STUDENTS DISCIPLINARY COMMITTEE      |
| 2  | TRAINING & PLACEMENT CELL            |
| 3  | GRIEVANCE & REDRESSAL COMMITTEE      |
| 4  | INTERNAL COMPLAINT COMMITTEE         |
| 5  | SC/ST/OBC MINORITY CELL              |
| 6  | SEDG CELL                            |
| 7  | ANTI RAGGING                         |
| 8  | SEXUAL HARASSMENT AT WORKPLACE.      |
| 9  | INTERNAL COMPLAINT COMMITTEE,        |
| 10 | Committee for ADTU Biodiversity Club |
| 11 | Women Empowerment Cell               |

## Facilities Available



## General Information

Total area: 55 acre

Total Built-up area: - . 740300 Mtr Sq.

Total Car area: - 19525 Mtr sq.

No of Students:-8138,

No of Staff: - 1033.

No of buses in the campus:-50.

No of motor cycles entering in the campus:-150.

No of E-Vehicle in the Campus: - 1 (Four wheeler)

No of RO water Plant: - 110

No of Bore well:-14.

No of Open well: - 3

No of Ponds / Reservoirs: - 4

No of Solar: -1.

No of Waste water treatment Plant:-1.

No of Rainwater harvesting system: 1

No of Vermicomposting: - 2.

STP: - 1.

No of Water tank (RCC) -8

No of Water tank (Sintex)-92.



Sustainability

World Environment Day Celebration



'Activity on Cleaning the University Campus under the Swachh Bharat Mission Abhiyan:'

Washrooms for the Divyanjan



Tactile pathway for Divyang

Ramp for the Divyanjan



Wheel Chair

Pedestrian Pathway



Vehicle restricted area

Medicinal Plant garden



Air Quality Display

Plantation Programme



---

## Green Audit

A Green Audit, acronymically termed as "Global Readiness in Ensuring Ecological Neutrality" (GREEN), refers to the systematic process of identifying, quantifying, recording, reporting, and analyzing environmental components and practices. Specifically applied within educational institutions, the green audit aims to assess environmental practices on university or university campuses and their impact on maintaining an eco- friendly atmosphere.

The purpose of a Green Audit is to analyze the environmental practices within and outside the campus, identifying how natural resources and energy are being consumed and utilized. This assessment encompasses the evaluation of both renewable and non-renewable resources, ensuring that the campus operates in an environmentally sustainable manner.

For institutions seeking accreditation from bodies such as the National Assessment and Accreditation Council (NAAC), a Green Audit report serves as crucial documentation. It provides practical insights into the institution's consumption of natural resources and energy, highlighting areas of strength and opportunities for improvement in achieving ecological neutrality. The report thus determines whether the educational campus is effectively utilizing natural resources or renewable energy sources, contributing to the overall goal of environmental sustainability.

## **Greenery Campus**

### **Paper use and Printing**

Staff members and Students are encouraged restricted printing and use of both sides of the papers for printing and reuse. This will encourage economical use of papers as well as save environments.

The continuous efforts taken by university in the renewable sector has triggered many other educational university to come forward and start understanding and putting their best efforts to implement & extract the tremendous source of energy flowing continuously on the earth since its creation.

University an educational institutions get benefit from this clean, renewable energy source of electricity every day due to its potential to reduce energy cost strong incentives & tax benefits etc. Electricity generated from the other sources like oil, coal & natural gas fluctuate in cost as well as its availability from time to time. But renewable source always has credits in its investment.

Biodiversity is facing serious threats from habitat loss, pollution, over consumption and invasive species. Species are disappearing at an alarming rate and each loss affects nature's delicate balance and our quality of life. Without this variability in the living world, ecological systems and functions would break down, with detrimental consequences for all forms of life, including human beings. Newly planted and existing trees decrease the amount of carbon dioxide in the atmosphere. Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. The amount of oxygen that a single tree produces is enough to provide one day's supply of oxygen for people.

So, while you are busy studying and working on earning those good grades, all the trees on campus are also working hard to make the air cleaner for us. Trees on our campus impact our mental health as well; studies have shown that trees greatly reduce stress, which a huge deal is considering many students are under some amount of stress.

## List of trees

25000+ Trees are planted inside the campus along with the medicinal plants. The campus is full of varieties of the Tree which are more than 50 in quantities which includes Large, Medium and Small Trees. Further below is the list of all tree species in the Campus.

### Green Campus Review

|  |                                                                                       |
|--|---------------------------------------------------------------------------------------|
|  |  |
|--|---------------------------------------------------------------------------------------|

Also, the tree saplings are distributed to the public as part of greenery initiative.

#### Type of trees and Quantity details

| S. No | Types of trees          | Location                             | No of Trees |
|-------|-------------------------|--------------------------------------|-------------|
| 1     | Timber yielding plant   | Throughout the campus                | 450         |
| 2     | Fruit yielding plant    | Throughout the campus                | 5000        |
| 3     | Flowering plant         | Throughout the campus                | 500         |
| 4     | Latex yielding plant    | Campus Block 1, 2 and 3              | 1100        |
| 5     | Fire wood               | Throughout the campus                | 1000        |
| 6     | Spice yielding plant    | Throughout the campus                | 500         |
| 7     | Fibre yielding Plant    | Campus Block 4                       | 700         |
| 8     | Gymnosperm              | Campus Block 3 and 6                 | 150         |
| 9     | Beverage yielding plant | Campus Block 4                       | 1000        |
| 10    | Ornamental plant        | Throughout the campus                | 1200        |
| 11    | Oil yielding Plant      | Campus block 3 and 6                 | 500         |
| 12    | Religious tree          | Campus Block 1, 3, 6, 8              | 250         |
| 13    | Bamboo                  | Campus Block 1, 2 and 3, 4<br>5,9,10 | 6000        |

| S. No          | Type of Medicinal plants | Location                    | No of Trees         |
|----------------|--------------------------|-----------------------------|---------------------|
| Herbs          |                          |                             |                     |
| 1              | Aloevera                 | Campus Block 4 (MAP garden) | Approx.<br><br>5000 |
| 2              | Tulsi                    | Campus Block 4 (MAP garden) |                     |
| 3              | Kalmegh                  | Campus Block 4 (MAP garden) |                     |
| 4              | Cynodon dactylon         | Campus Block 4 (MAP garden) |                     |
| 5              | Mint                     | Campus Block 4 (MAP garden) |                     |
| Medicinal Tree |                          |                             |                     |
| 1              | Kadomba                  | Throughout the campus       | 300                 |
| 2              | Elephant Apple           | Throughout the campus       |                     |
| 3              | Eucalyptacus             | Throughout the campus       |                     |
| 4              | Neem                     | Throughout the campus       |                     |
| 5              | Kanchan                  | Throughout the campus       |                     |
| 6              | Chandan                  | Throughout the campus       |                     |
| 7              | Rudraksh                 | Throughout the campus       |                     |

| S. No | Trees planted outside Institutions | Location                             | No of Trees  |
|-------|------------------------------------|--------------------------------------|--------------|
| 1     | Fruit yielding plant               | Adopted villages                     | Approx. 3000 |
| 2     | Ornamental trees                   | Adopted villages/ Outside Road Areas | 2000         |
| 3     | Air purifying trees                | Adopted villages/ Outside Road Areas | 3000         |
|       |                                    |                                      |              |
| S. No | Indoor plants                      | Location                             | No of Plants |
| 1     | Palm Plant                         | Block A to Block L                   | Approx. 5000 |
| 2     | Peace Lily                         | Block A to Block L                   |              |
| 3     | Money Plant                        | Block A to Block L                   |              |
| 4     | Creeping Charlie                   | Block A to Block L                   |              |
| 5     | Snake Plant                        | Block A to Block L                   |              |

### **"Carbon emissions is controlled through various measures."**

To reduce your carbon footprint, focus on sustainable transport (walk, bike, public transit, EV), energy efficiency at home (LEDs, insulation, renewables), a plant-based diet (less meat/dairy), and conscious consumption (reduce, reuse, recycle, buy less, buy local) to cut greenhouse gas emissions from driving, home energy, food, and waste.

Carbon emissions refer to the release of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases into the atmosphere, primarily through human activities like burning fossil fuels, deforestation, and industrial processes. Controlling

carbon emissions is crucial to mitigate climate change.

### **Recommendation**

Save Energy With Weatherization.  
Switch to Clean Heating and Cooling.  
Tap Into Renewable Power.  
Opt for Low-Carbon Transport.  
Upgrade to Efficient, All-Electric Appliances.  
Electrify Yard Equipment.  
Landscape with Native Plants.  
Reduce and Compost Food Waste.

### **5 R's: of Carbon Foot Print**

Refuse, Reduce, Reuse, Repurpose, and Recycle.



An energy audit is a systematic inspection and analysis of how energy is used in a building or process, identifying waste, pinpointing inefficiencies, and recommending cost-effective ways to improve energy efficiency and reduce consumption, often leading to significant savings in energy bills and a smaller carbon footprint, with steps including data review, on-site measurements (HVAC, lighting, insulation), and detailed reports with investment payback analyses.

### **Benefits of Energy Efficiency**

#### **1. Environmental Benefits:**

- **Lower GHG Emissions:** Increased energy efficiency reduces the amount of fossil fuels burned, thereby decreasing GHG emissions and other pollutants.
- **Reduced Water Usage:** Many power generation methods, particularly fossil fuel and nuclear plants, consume large amounts of water. By reducing energy consumption, we can also decrease water usage.

#### **2. Economic Benefits:**

- **Lower Utility Bills:** Energy efficiency reduces the amount of energy consumed, leading to lower electricity and heating bills.
- **Job Creation:** The energy efficiency sector creates jobs in manufacturing, installation, and maintenance of energy efficient

technologies.

- **Stable Electricity Prices:** By reducing overall demand, energy efficiency can help stabilize electricity prices and reduce volatility in the energy market.

### **Practical Tips for Energy Conservation**

#### **Switch Off Appliances**

**Avoid Standby Mode:** Turn off appliances at the power point rather than leaving them on standby, which can still consume energy.

**Turn off Heaters and Coolers:** Switch off heaters, cooling units, and other appliances when you go to bed or leave the house.

**Night time and Absence:** Turn off computers, printers, Wi-Fi routers, and other equipment overnight or when you're away for extended periods.

To be maintained the power factor 0.9. To be used Sensor based lights.

Boys and lady's hostel max try to fix the main switch out of the room.

To be validate the electrical equipment's power consumption by voltmeter or replace the same after 5 years by latest high grade.



### Equipment's Energy Consumption Data

| S. No | Equipment's                | Quantity | Average energy consumption |
|-------|----------------------------|----------|----------------------------|
| 1     | 7.5 HP Submersible Pump    | 10       | 14625                      |
| 2     | 6 HP Submersible Pump      | 2        | 390                        |
| 3     | 15 HP Mono Block Pump      | 3        | 2633                       |
| 4     | 18 HP Mono Block Pump      | 1        | 351                        |
| 5     | 5 HP Open Submersible Pump | 4        | 1560                       |
| 6     | 1.5 HP Pump Motor          | 6        | 1053                       |
| 7     | Air Conditioner 1 Ton      | 4        | 156                        |
| 8     | Air Conditioner 1.5 Ton    | 69       | 4037                       |
| 9     | Air Conditioner 2 Ton      | 93       | 7254                       |
| 10    | Air Conditioner 3.5 Ton    | 1        | 169                        |
| 11    | Air Conditioner 4 Ton      | 14       | 3094                       |
| 12    | LED Lights                 | 2608     | 1356                       |
| 13    | LED Lights                 | 480      | 112                        |
| 14    | LED Lights                 | 120      | 78                         |
| 15    | Florescent Lamps           | 139      | 361                        |
| 16    | Florescent Lamps           | 15       | 59                         |
| 17    | Florescent Lamps           | 10       | 52                         |
| 18    | CFL                        | 421      | 219                        |
| 19    | Solar Panel                | 4        |                            |
| 20    | Fans                       | 1611     | 2513                       |
| 21    | Exhaust Fans               | 371      | 386                        |
| 22    | Printers                   | 98       | 114.66                     |
| 23    | Photocopy Machines         | 2        | 39                         |
| 24    | Computer                   | 888      | 1501                       |
| 25    | RO Plant                   | 76       | 10868                      |
| 26    | Water Cooler               | 52       | 811                        |
| 27    | DG 1 (400 kVA )            | 1        | 8320                       |
| 28    | DG 2 (320 kVA)             | 1        | 6656                       |

## Energy Conservation Recommendation - Ceiling Fan (Appx Calculation)

No of fan available in the Campus -750 Appx

Fan Watt - 70 w

Running works per day -6.5 Hrs

Energy Cost per unit Kwh -9.5 Rs.

Working day per Annum - 270 days.

Annual Energy Consumption  
 $= 750 \times 70 \times 6.5 \times 270 / 1000$   
 $= 92137.5 \text{ Kwh} \text{ ----- } 1$

Proposed Fan BLDC -25w  
 $= 750 \times 25 \times 6.5 \times 270 / 100$   
 $= 32906.25 \text{ Kwh} \text{ ----- } 2$

Annual Energy Saving  
 $= 1 - 2$   
 $= 59231.25 \text{ Kwh}$

Cost Saving per Annum  
 $= 59231.25 \times 9.5$   
 $= 562696.87 \text{ Rs}$

Cost of proposed BLDC fan  
 $= 750 \times 2500 \text{ Rs}$   
 $= 1875000$

Pay back  
 $= \text{Investment} / \text{Annual Saving}$   
 $= 1875000 / 562696.87$   
 $= 3.3 \text{ Year}$

## Conclusion

Description: Fan.

Recommended: BLDC.

Saving Kwh / Annum: - 59231.25.Kwh.

Cost Saving / Annum: - 562696.87 Rs

Investment: 1875000 Rs

Pay back: - 3.3 Year.

### Energy consumption, Energy cost and Diesel consumption

| S.No | AY -2024 – 2025 | Energy Consumption KWH | Energy Cost in Rs | Diesel/ Petrol Consumption in Lit |                        |
|------|-----------------|------------------------|-------------------|-----------------------------------|------------------------|
|      |                 |                        |                   | DG 1 (400 KVA)(Ltr/Hr)            | DG 2 (320 KVA)(Ltr/Hr) |
| 1    | Jun-24          | 95887.44               | 1863809           | 61                                | 39                     |
| 2    | Jul-24          | 159588                 | 1723266           | 65                                | 41                     |
| 3    | Aug-24          | 149054                 | 1646365           | 65                                | 41.5                   |
| 4    | Sep-24          | 199188                 | 2104171           | 65                                | 41                     |
| 5    | Oct-24          | 134165                 | 1475275           | 65                                | 42                     |
| 6    | Nov-24          | 144461                 | 1570334           | 60                                | 39.5                   |
| 7    | Dec-24          | 123632                 | 1372525           | 60                                | 39                     |
| 8    | Jan-25          | 115395                 | 1292179           | 60                                | 39                     |
| 9    | Feb-25          | 123394                 | 1354088           | 60                                | 39                     |
| 10   | Mar-25          | 141610                 | 1568207           | 62                                | 40                     |
| 11   | Apr-25          | 141669                 | 1505912           | 65                                | 41.5                   |
| 12   | May-25          | 157741                 | 1663840           | 65                                | 42                     |

## **Diesel Generators**

Diesel generators, while commonly used for emergency power, can also serve a secondary function by feeding power to utility grids during peak periods or when there is a shortage of power from larger generators. However, there are several considerations to keep in mind regarding their operation and environmental impact:

1. **Minimize Idle Time:** Ensure that diesel generators are not left idling unnecessarily, as this increases fuel consumption and emissions.
2. **Regular Maintenance:** Regular maintenance can improve generator efficiency and reduce emissions. This includes timely oil changes, air filter replacements, and fuel system checks and ensure AMC.
3. **Load Management:** Optimize load management to ensure generators operate within their optimal load range. Avoid running multiple generators at low loads if a single generator can handle the load more efficiently.

### **Alternative Solutions**

**Renewable Integration:** Where feasible, integrate renewable energy sources such as solar with diesel generators to reduce overall diesel consumption and GHG emissions.

**Energy Storage:** Utilize battery storage systems to store excess energy produced during peak operation periods and use it during off-peak periods, reducing the reliance on diesel generators.

### Diesel Generator



## Renewable Energy

### Solar panel

The main focus to grill the solar projects on speed, skill and scale to drive reforms in solar renewable energy sector. Basically this has two revenue flows. Saving due to the avoided cost of power purchased from the grid and second to sale excess energy generated over and above the consumption with in a period of time.

In addition, this environment friendly technology will yield a saving of approx. 220.tons of CO2 equivalent per annum, as apart of green house. Gases. It is worthwhile to mention that the objective of this prestigious project is to show – case the Indian technology expertise in the field of solar photovoltaics'. By installing solar power plant at University is showing a commitment to the green Technology initiative.

A solar panel is a device that converts sunlight into electricity through the use of photovoltaic (PV) cells. These cells are made of materials, typically silicon that generate excited electrons when exposed to light, creating an electric current. Solar panels, also known as photovoltaic, offer a versatile and eco- friendly solution for generating electricity from the Sun, making them an

Integral part of modern energy systems aimed at sustainability and environmental conservation.

Celling fans

University has about 750 appx nos of celling fans of 70W each.



**Solar Panel 1 & 2**

### **Uses of Solar Panels**

Installing solar panels in a university offers numerous benefits:

1. **Renewable energy source:** Solar panels harness sunlight, a renewable and sustainable energy source, reducing reliance on fossil fuels.
2. **Energy savings:** Solar panels generate electricity, reducing the university's energy consumption and lowering utility bills.
3. **Carbon footprint reduction:** Solar panels produce clean energy, decreasing the university's carbon emissions and contributing to a sustainable future.
4. **Educational opportunities:** Solar panels provide hands-on learning experiences for students, teaching them about renewable energy, sustainability, and environmental stewardship.
5. **Increased energy independence:** Solar panels enable the university to

generate its own energy, reducing dependence on the grid and enhancing energy security.

6. Cost-effective: Solar panels require minimal maintenance and have a long lifespan (25+ years), making them a cost-effective energy solution.

7. Enhanced reputation: By embracing solar energy, the university demonstrates its commitment to sustainability, enhancing its reputation and attracting environmentally conscious students and faculty.

8. Research opportunities: Solar panels provide a platform for research and innovation, enabling students and faculty to explore new solar energy technologies and applications.

9. Energy storage and backup: Solar panels can be integrated with energy storage systems, providing backup power during outages and ensuring continuous energy supply.

## **Recommendation**

- An efficient power management system may be incorporated to  
Computers can be set to automatic power saving mode
- Optimize the brightness of the screen.
- AC and Refrigerators can be improvised with high rating.
- AC can be maintained at 24°C.
- Solar Heater / Solar Street light can be implemented for the following benefits.

## **Energy Benefits**

1. Reduced energy consumption: Solar heaters use free solar energy, reducing reliance on fossil fuels and lowering energy bills.

2. Energy efficiency: Solar heaters can achieve efficiency rates of 60-80%, compared to traditional heaters (40-60%).

3. Peak demand reduction: Solar heaters can reduce peak demand during summer months, alleviating stress on the grid.

### **Green Audit Benefits:**

1. Carbon footprint reduction: Solar heaters emit significantly less greenhouse gases (GHGs) and pollutants compared to traditional heaters.
2. Renewable energy source: Solar energy is a renewable and sustainable source, reducing dependence on finite resources.
3. Reduced water pollution: Solar heaters eliminate the risk of water pollution associated with traditional heating systems.
4. Increased energy independence: Solar heaters reduce reliance on grid electricity, enhance energy security and resilience.
5. Long-term sustainability: Solar heaters have a lifespan of 20-30 years or more, ensuring long-term sustainability.

### **Beyond Campus Environmental Promotion**



---



Environmental audits ensure that the environment remains balanced and provides an eco-friendly atmosphere for stakeholders. They assess how waste materials are managed and identify sources of waste, offering solutions for environmental degradation. A specific type of environmental audit is the Green Campus Audit, which focuses on maintaining and enhancing green spaces within educational institutions to promote a healthy atmosphere.

### **Environmental Audits:**

- Purpose: Ensure that environmental practices do not disturb the balance of natural ecosystems, providing an eco-friendly atmosphere.
- Waste Management: Identify how waste is managed, sources of waste, and propose solutions to mitigate environmental degradation.

### **Benefits and Implementation**

- Eco-Friendly Youth Leadership: Programs and practices that foster eco-friendly youth leadership, social responsibility, and institutional values related to the ecosystem are evaluated.
- Comprehensive Approach: Both biotic (living) and abiotic (non-living) factors are considered to maintain environmental viability.

### **Biotic and Abiotic Factors:**

- Biotic Factors: Include all living organisms such as plants, animals, fungi, bacteria, and viruses. These organisms interact and influence the environment through their biological processes.
- Abiotic Factors: Include non-living components like temperature, humidity, salinity, sunlight, rainfall, gases, minerals, and vitamins. These factors affect the survival and reproduction of organisms.

## Waste Management

### Efforts towards effective waste management

Waste Management Processes strives to have a minimal impact on the environment and is dedicated to reduce and manage the waste generated by the university campus. The following specific procedures will be undertaken to ensure ADTU contribution in protecting the environment.

### Solid Waste Management

Solid Waste Management With its aim to provide holistic education that also has a positive impact on the environment, the university will adopt practices that will mitigate the generation, and manage solid waste through the following methods:

- Systematically engage with the 3Rs of environment friendliness (**Reduce, Reuse and Recycle**).
  
  
  
  
  
  
  
  
  
  
- Collect paper waste produced on campus and collaborate with scrap dealers for recycling.
- Reduce solid waste by developing a technology-centric teaching and administrative model.
- Reduce use of paper by supporting digitization of attendance and internal assessment records.
- Reduce requirement of printed books by updating the e-books and e-journals collection of the university library.
- Encourage the students and teachers to use emails / WhatsApp for assignment submissions.

- Take initiatives to spread awareness amongst students about Food wastage and ways of minimizing it
- Minimizing the use of packaged food, Junk food and Artificial drinks inside of the campus.
- The habit of reusing and recycling non-biodegradable products
- Organizing workshops for students on solid waste management.

**The following categories of solid waste are generated in the university premises.**

- Garden & Food Waste: - Dry leaves from garden is used to make manure at the backside of the cricket lawn and the compost is used to maintain the lawns and gardens of the university.

### **Plastic Free Zone**



## Sewage Treatment Plant

### Sewage Treatment Plant



University does not produce any hazardous waste water. Sewage Treatment Plant based on fluidized bed bio reactor (FAB) technology has been installed in the campus to treat the generated wastewater ensuring zero discharge to municipal sewage treatment plants. Additionally there are storage tanks with sufficient capacity each. The treated waste water is used for horticulture of the university campus.

### Water conservation and management (Rainwater harvesting).

Rainwater harvesting structures have been constructed within the University premises. Tanks are regularly cleaned before the onset of the monsoon to catch the rain water, to ensure "Zero discharge" of rainwater beyond the campus.



### RAIN WATER HARVESTING

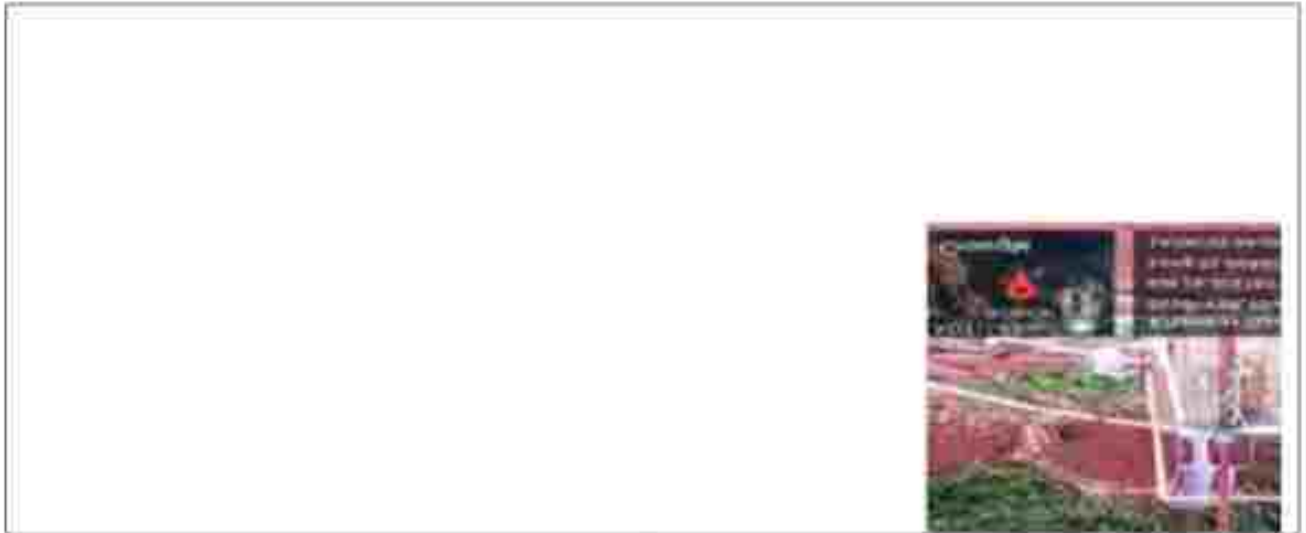
## Benefits of Rainwater Harvesting

- Water conservation: Reduces demand on potable water sources.
- Reduced water bills: Decreases water costs for non-potable uses.
- Increased water independence: Less reliance on municipal water supplies.
- Improved water quality: Reduces storm water runoff and associated pollutants.
- Enhanced water security: Provides a backup water source during droughts or outages.
- Improved groundwater recharge: Helps replenish groundwater aquifers.
- Reduced energy consumption: Less energy needed to treat and transport water.
- Increased water storage: Provides additional water storage for fire suppression and emergency uses.
- Environmental benefits: Reduces pollution, supports aquatic ecosystems, and enhances biodiversity.
- Educational opportunities: Teaches students and communities about water conservation and sustainability.

## Conserve Water



## Water Treatment Plant (WTP)



### Benefit of WTP:

1. Provides clean drinking water for communities.
2. Protects public health by removing contaminants.
3. Supports industrial and agricultural development.
4. Enhances environmental sustainability.
5. Boosts economic growth by ensuring water security.

Solid Waste disposal, Garbage and Food Waste & Plastic Free campus



|        |           |
|--------|-----------|
| 2' No' | Block No' |
|--------|-----------|

Washing Water C

|        |           |
|--------|-----------|
| 01     | V Block   |
| 2' No' | Block No' |

Drinking Water C

## **E-Waste Management**

- E- Waste is segregated and reused where ever relevant or else the e-waste is recycled to external vendors. The university also has association and MOU with M/S United Global Trust, India's largest E-Waste Management Company for proper disposal of e-waste materials. E-Waste Management AdtU ensures that its usage of technology and generation of e-waste does not impact the environment.

For this purpose, the university plans to strive towards:

- More provisions for the disposal of the institutional e-waste.
  - Collaboration with e-waste recycling companies to get electronic waste recycled.
- E-Waste Management ensures that its usage of technology and generation of e-waste does not impact the environment.

For this purpose, the university plans to strive towards:

- More provisions for the disposal of the institutional e-waste.
- Collaboration with e-waste recycling companies to get electronic waste recycled.
- Awareness amongst students about reduction of e-waste and environment friendly disposal practices for e-waste.
- Encouraging department and society level activities pertaining to e- waste management.

## **Degradable and Non Degradable waste**

Waste is disposed through an authorized vendor. University also sign an MOU for disposal of waste to the vendor. Primary segregation of the waste is being practices and reuse of plastic and paper waste is encouraged through student's project.

Waste management has been a difficult task. The Government of India launched the 'Swachh Bharat Abhiyan,' program with the goal of cleaning. Various initiatives have been undertaken to educate students on effective waste management techniques in order to spread the 'Clean India' mission.

## Water Management

Water is a natural resource; all living matters depend on water. While freely available in many natural environments, in human settlements potable (drinkable) water is less readily available. We need to use water wisely to ensure that drinkable water is available for all, now and in the future.

A small drip from a leaky tap can waste more than appx 180 litres of water a day; that is a lot of water to waste - enough to flush the toilet eight times! 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.

Water auditing is conducted for the evaluation of facilities for raw water intake and to determine the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water. It is therefore essential that any environmentally responsible institution examine its water use practices.

### Source of Water, Storage and Distribution

Water is one of the main consumables in the university campus. ADTU gets water from different sources namely

- 1) Bore well
- 2) Rainwater Harvesting (RWH).

Table shows the sources of water, location of storage along with their application.

| Type of Water | Sources                                     | Location of Storage | Application                             |
|---------------|---------------------------------------------|---------------------|-----------------------------------------|
| Fresh Water   | Bore well                                   | university campus   | Drinking & cooking (through RO Process) |
| Rain Water    | Collected from main buildings run off water | university campus   | Used to increase ground water level     |

## Water Quality

| 1 | RO Water      | pH  | TDS(mg/L) | Turbidity |
|---|---------------|-----|-----------|-----------|
| 2 | Tap Water     | 7.0 | 36        | 0.2 NTU   |
| 3 | Well Water    | 7.5 | 50        | 0.4 NTU   |
| 4 | Pond Water    | 8.0 | 200       | 1.5 NTU   |
| 5 | Waste Water   | 8.0 | 180       | 1.5 NTU   |
| 6 | Treated Water | 7.0 | 120       | 0.8 NTU   |

## Chemistry Lab (Impact & Aspect)

## Water consumption data

| Water Consumption in Liter |                 |       |          |          |        |
|----------------------------|-----------------|-------|----------|----------|--------|
| S.No                       | AY -2024 - 2025 | Unit  | Drinking | Planting | Hostel |
| 1                          | Jun-24          | Litre | 118255   | 12700    | 23600  |
| 2                          | Jul-24          | Litre | 110150   | 12000    | 22000  |
| 3                          | Aug-24          | Litre | 112550   | 11105    | 21580  |
| 4                          | Sep-24          | Litre | 114220   | 13550    | 22580  |
| 5                          | Oct-24          | Litre | 120450   | 11220    | 24100  |
| 6                          | Nov-24          | Litre | 100100   | 8200     | 20200  |
| 7                          | Dec-24          | Litre | 105000   | 7800     | 20500  |
| 8                          | Jan-25          | Litre | 100200   | 8100     | 20000  |
| 9                          | Feb-25          | Litre | 106250   | 10150    | 21000  |
| 10                         | Mar-25          | Litre | 110210   | 10520    | 21200  |
| 11                         | Apr-25          | Litre | 112150   | 11120    | 22100  |
| 12                         | May-25          | Litre | 115200   | 11900    | 22500  |

## Biogas Plant



Biogas is a renewable energy source created from the breakdown of organic matter (like food scraps, animal manure, and sewage) by microorganisms in the absence of oxygen, a process called anaerobic digestion, producing a gas rich in methane ( $\text{CH}_4$ ) and carbon dioxide ( $\text{CO}_2$ ). This clean-burning fuel can be used for cooking, heating, generating electricity, or upgraded to Compressed Biogas (CBG) for vehicle fuel, while the leftover material serves as a rich fertilizer, making it an economical and environmentally friendly alternative to fossil fuels.

- Biogas is a renewable energy source produced from organic waste.
- Reducing dependence on fossil fuels.
- Biogas production captures methane emissions, reducing greenhouse gas emissions and mitigating climate change.
- Biogas production helps manage organic waste, reducing landfill waste and environmental pollution.
- Biogas production generates nutrient-rich slurry, used as organic fertilizer, promoting sustainable agriculture.
- Biogas production can help maintain ecosystem balance by utilizing waste biomass and reducing synthetic fertilizers.

## Vermicomposting



Vermicomposting

Composting and vermin-composting are techniques used to decompose natural residues that can be used as fertilizers for plants. This technique involves a big quantity of microorganisms, multiple invertebrates and a legion of fungi in an effort to flip the ingredients into the first-class vermin-compost round – if executed within the right situations. Vermicomposting is a kind of compost that is made with earth worms; a selected sort of earth worms known as *Eisenia foetida*, a laboratory hybrid this is capable of devouring a big amount of organic deposits and then turning them into compost

- Vermicomposting helps manage food waste, reducing landfill waste and environmental pollution.
- Promotes sustainable practices and environmental stewardship among students and staff.
- Produces a nutrient-rich fertilizer for campus gardens and landscaping
- Provides hands-on learning experiences for students in environmental science, sustainability, and biology.

Offers opportunities for research and innovation in sustainable.

## **Liquid Waste Management**

- Maintain leak proof water fixtures.
  - Minimize the use of water by constructing more Indian style toilets instead of western style toilets.
  - Continued employment of a caretaker to take immediate steps to stop any water leakage through taps, pipes, tanks, and toilet flush etc.
  - Prevention of release and mixing of oil from the university canteen liquid waste in the municipal drainage system by use of Grease trap.
- 
- Save water message is displayed at all water sources made available for employees, staff and students.
  - Continued employment of a caretaker to take immediate steps to stop any water leakage through taps, pipes, tanks, and toilet flush etc.
  - Under water tanks are present to conserve water for daily use.
  - Rainwater harvester is constructed to utilize rain water.
- 
- Wastewater treatment tanks play a crucial role in maintaining a healthy environment, protecting public health, and supporting economic growth
    - Waste water treatment plant is installed to treat waste water.
    - STP Plant is installed.
    - Ponds.

## Waste Water Treatment Plant (WWTP)



**Wastewater treatment Plant**

Wastewater recyclers are important features in any Organization or Industry. Once for all the implementation should follow the proper guidelines for wastewater treatment system discharge standards as per central pollution control board (CPCB). The main feature of these discharge standards is the treated water should not be harmful to the biodiversity, resources and the environment.

### **Wastewater treatment Plant Benefits**

1. Water pollution control.
2. Environmental protection.
3. Public health protection.
4. Water reuse and recycling.
5. Reduced water scarcity.
6. Reduces soil contamination.
7. Protects aquatic life and ecosystems.
8. Prevents water pollution by removing harmful contaminants before discharge.

## Reinforced Cement Concrete (RCC) water tanks benefit



RCC water Tank

An RCC water tank is a durable water storage container made from Reinforced Cement Concrete, essentially concrete strengthened with steel bars (rebar) or wire mesh, offering strength, longevity, and resistance to leaks, used widely for residential, commercial, and industrial water storage, both underground and overhead. They are known for their robust nature, ability to withstand extreme conditions, and low maintenance, making them a popular choice for safe water storage.

### Benefits

High strength & durability.

Long service life.

Prevents contamination when properly water proofed.

No reaction with stored water.

Ideal for drinking water & treated wastewater.

Maintains stable temperature.

Easy to repair & retrofit.

Supports rainwater harvesting systems.

## Pond Area

- Pond Recharges groundwater aquifers, ensuring sustainable water supply.
- Filters rainwater and runoff, improving groundwater quality.
- Enhances groundwater storage, helping adapt to climate change.
- Reduces demand on municipal water supplies, promoting water conservation.
- Demonstrates AdtU commitment to environmental stewardship and sustainability.

A pond area refers to a design to a designated water body used for water storage treatment, recharge, ecology, or landscaping, especially in campuses, industries, and municipal projects.

### Key purposes

Rainwater harvesting & storage.

Groundwater recharge.

Biodiversity & ecological balance.

Storm water management.



Pond Area

## Natural Spring Water Tank

### Benefits

1. Chemical-free water: Spring water is naturally filtered, free from chemicals and additives.
2. Better taste and odor: Spring water has a natural, refreshing taste and odor.
3. Rich in minerals: Spring water contains beneficial minerals and electrolytes.
4. Alkaline properties: Spring water tends to be alkaline, which can help neutralize acidity.
5. Natural filtration: Spring water passes through natural rock and soil filtration.



Natural Spring Water Tank

## Indoor air quality

They have facility to measure particulate matter check of the same performed 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. The range of the instrument is given below.

### Air Quality Measurements

| Air Quality Audit Check Sheet through third party inspection Once in a year/ |                     |            |                |         |
|------------------------------------------------------------------------------|---------------------|------------|----------------|---------|
| Sr no                                                                        | Description         | O2 %       | CO2 PPM        | Remarks |
|                                                                              | Specification       | 18 to 22 % | 400 to 800 ppm |         |
| 1                                                                            | Class Room          | 21%        | 420            | Ok      |
| 2                                                                            | Auditorium          |            |                | Ok      |
| 3                                                                            | Seminar Hall        |            |                | Ok      |
| 4                                                                            | Library             |            |                | Ok      |
| 5                                                                            | Laboratory          |            |                | Ok      |
| 6                                                                            | Canteen             |            |                | Ok      |
| 7                                                                            | Hostel              |            |                | Ok      |
| 8                                                                            | Open Area           |            |                | Ok      |
| 9                                                                            | Car Parking Area    |            |                | Ok      |
| 10                                                                           | Any other (Specify) |            |                | Ok      |

### COMFORT LEVEL

Discomfort can be caused to the occupants due to

- Inadequate ventilation
- High temperature and humidity levels
- High levels of CO2

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 vision 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<sub>2</sub> is a colorless, odorless, and tasteless gas. It is a product of completed carbon combustion and the by-product of biological respiration. ASHRAE states that CO<sub>2</sub> concentrations in acceptable outdoor air typically range from 300-800 ppm. Adverse health effects from CO<sub>2</sub> may occur since it is an asphyxiate gas. The CO<sub>2</sub> levels can be used as a rough indicator of the effectiveness of ventilation, and excessive population density in a structure. CO<sub>2</sub> 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<sub>2</sub> in indoor air can reveal information regarding occupant densities and outdoor air ventilation rates. High CO<sub>2</sub> levels may indicate a problem with overcrowding or inadequate outdoor air ventilation rates. CO<sub>2</sub>, 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<sub>2</sub> 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.

## INFERENCES

- Carbon-di-oxide levels are within the ASHRAE 55-1992 limit in the outdoor and indoor. For indoor condition, CO<sub>2</sub> level should be less than 800 ppm. CO<sub>2</sub> 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 programs on environmental consciousness are organized and it is evidenced through the student participation in the respective activities.

In order to quantify the oxygen level, Oxygen Meter is used, If Oxygen level is low in the atmosphere lead to Headaches and shortness of breath to human beings, if it excess, it causes Oxygen toxicity and Oxygen poisoning by creating coughing, breathing trouble and damage the lungs to human beings

### Carbon Monoxide as CO and Sulphur Dioxide as SO<sub>2</sub> Level in the University

| S. No.             | Name of the Test          | Test Method                    | Unit | Results | Max annual average limits of NAAQs |
|--------------------|---------------------------|--------------------------------|------|---------|------------------------------------|
| Near to Main block |                           |                                |      |         |                                    |
| 1.                 | Carbon monoxide<br>CO     | Instruments<br>Manual<br>Based | g/M3 | < 1.2   | 2 Within the limits                |
| 2.                 | Sulphur Dioxide<br>As SO2 |                                | g/M3 | 5.9     | 50 Within the limits               |
| Near to canteen    |                           |                                |      |         |                                    |
| 1.                 | Carbon monoxide<br>CO     | Instruments<br>Manual<br>Based | g/M3 | < 1.2   | 2 Within the limits                |
| 2.                 | Sulphur Dioxide<br>As SO2 |                                | g/M3 | 6.1     | 50 Within the limits               |

### Recommendation

- Conventional activities like Nature club, Eco club, Science club, Fine Arts club, Flora and Fauna club, Youth Red cross unit, etc. Seminar, Conference.
- Workshop, training and awareness programs' on Biodiversity conservation education, environmental awareness programs
- No vehicle day can be practiced
- Low cost wind energy can be placed.

### Lux & Noise Level

Light intensity and Noise level measured by Lux meter and Noise meter at various Location in the University campus found with in specification only.

## Best Practices of the university

The presence of zebra crossing lines and Pedestrian -Friendly pathways on university premises reflects its dedication to ensuring student safety and to steering a responsible campus community.

The presence of speed breakers and Signboard at the university's entrance indicates its proactive approach to managing vehicle speed and prioritizing Campus safety.

Sensor based water conservation initiated & Sensor based Flush.

Vermicomposting initiated in the campus to avoid using chemical fertilizers for the plant.

STP and Waste water recycling Treatment plant for water conversion in the campus.

Plastic free campus initiated to save environment.

E -vehicle initiated for energy conversation.

E-waste, Solid waste disposed through authorized vendor.

ADTU committed to Green movement and has 60 percent of Green area.

Quality hospital, Yoga, GYM and Thought lab facilities are made available to everyone, ensuring equal access to healthcare and promoting a healthy society.

The presence of CCTV cameras across the campus highlights the management's priority on student safety

Creating a safe and secure campus community

Preventing crime and ensuring justice

Protecting students, staff, and faculty from harm

Maintaining a high level of situational awareness

Demonstrating a proactive approach to safety and security.

Solar lamps are available to ensure energy saving and provide a sustainable lighting solution, reducing our reliance on traditional electricity sources and minimizing our carbon footprint.

Sub meter initiated to ensure consumption of each & every floor & Building.

Water flow meter initiated to monitor water consumption.

Natural ventilation initiated.

Nomenclature of Tree & Plantation.

E-vehicle motivated among students & 2 wheeler parked under the tree.

|                                                                                                       |                              |
|-------------------------------------------------------------------------------------------------------|------------------------------|
| <b>E-Vehicle</b><br> | <b>Solar Light</b>           |
| <b>CCTV</b><br>    | <b>Water Treatment Plant</b> |



STP

Health Centre



Sensor based Water tap

Sensor based Toilet flush



Natural light enforced

Air Quality Display



Sub meter initiated to ensure consumption of each & every floor

Water flow meter initiated to monitor water consumption,



Natural ventilation initiated.

E-vehicle motivated among students & 2 wheeler parked under the tree



Nomenclature of Tree & Plantation.

Emergency lamp initiated



Fire assembly point.

Emergency no displayed

|                             |                     |
|-----------------------------|---------------------|
|                             |                     |
| High rated AC               | Awareness Poster    |
|                             |                     |
| LED bulb fixed              | Motion Sensor Light |
|                             |                     |
| Sensor based smoke detector | Solar Dryer         |



Solar Plant

Natural Light

Lift for Student & Staff

Tactile pathway for Divyang

Ramp

Campus Shuttle Service



Safety Grill

Sky light roof (Natural Light)



Fire hydrant & Alarm

Fire Exit Plan

Sand Bucket

Fire Extinguisher with instructions



Poster for Avoid single use plastic.

Dust Bin



Colour dust bin

Needle Disposable facility

Sanitary napkin incinerator

Poster

## **Criteria wise Opportunities for improvement (OFI):**

### **Energy:**

Control panel room keep neat & clean & provide Rubber mat for Safe handling.

DG chimney height to be increased to avoid CO<sub>2</sub> emission inside the university campus.

### **Environment:**

Portable fire extinguisher to be Initiated.

Oil spillage to be avoid.(Near DG).

Waste segregation at source to be initiated.

Air quality display - Acceptable Limit to be fixed.

First Aid boxes shall be maintained at least one per building with all the required items & ensure expiry date.

### **Green:**

Drip & Sprinkling system to be initiated for gardening throughout the university to save natural resource.

QR bar code for tree to be initiated to cover entire history.



Control panel room keep neat & clean & provide Rubber mat for Safe handling.

DG chimney height to be increased to avoid CO2 emission inside the university campus.



Waste segregation at source to be initiated.

## Conclusion

The green audit assists in the process of monitoring and verifying the performance in the environmental area and is fast becoming an indispensable aid to decision making in University.

The green audit reports assist in the process of attaining an eco-friendly approach to the sustainable development of the University. Hope that the results presented in the green auditing report will serve as an opportunity to improve the environment-related practices and resource usage at the university as well as new activities and innovative practices. A few recommendations are added to waste management using eco-friendly and scientific techniques. This may lead to a prosperous future in the context of Green Campus and thus sustainable environment and community development.

It has been shown frequently that the practical suggestions, alternatives, and observations that have resulted from audits have added positive value to the audited organization. An outside view, perspective and opinion often help staff who have been too close to problems or methods to see the value of alternative approaches. A green audit report is a very powerful and valuable communications tool to use when working with various stakeholders who need to be convinced that things are running smoothly and that systems and procedures are coping with natural changes and modifications that occur.

## **Disclaimer**

This Report has been prepared based on input data submitted by the representatives of the ADTU University.

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

If you wish to distribute copies of this report external to your organization, then all pages must be included.

We will keep all this information confidential relating to your University and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies.

## Extra credit 1



## Extra credit 2

