GREEN AUDIT REPORT

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY AND SCIENCES (A)

(ANITS)

Sangivalasa, Bheemunipatnam Mandal, Visakhapatnam,

Andhra Pradesh-531162, India

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GREEN AUDIT ASSESSMENT TEAM

S.NO	Name	Designation	Committee Role	Signature
1	Dr. B. N. D. Narasinga Rao	Professor, HOD Department of Civil	Coordinator	
2	Mrs. P. V. R. Sravya	Assistant Professor Department of Civil	Member	
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PREAMBLE

Anil Neerukonda Institute of Technology and Sciences (ANITS) was established in the academic year 2001–02 by the Anil Neerukonda Educational Society (ANES), founded by Dr. N.B.R. Prasad, an NRI philanthropist from the USA. The institute was established in memory of his son, Late Anil Neerukonda, with the aim of providing quality education in the fields of technology and sciences. ANITS operates with the approval of the All-India Council for Technical Education (AICTE), New Delhi, and the Government of Andhra Pradesh. It is affiliated with Andhra University, one of India's oldest universities, and is in Sangivalasa, Bheemunipatnam Mandal, approximately 30 km from Visakhapatnam.

Initially admitting 220 students, ANITS now offers nine undergraduate programs, including ECE, EEE, CSE, CSE (Data Science), CSE (AI & ML), IT, Mechanical, Civil, and Chemical Engineering, with a total intake of 1080 students. Additionally, it offers six postgraduate programs in Communication Systems, Control Systems, Computer Science & Technology, Machine Design, Biotechnology, and Soil Mechanics, with an intake of 99 students.

ANITS has consistently pursued excellence in education and research. It was first accredited by the National Board of Accreditation (NBA) in 2008 for four programs and later for five programs in 2013 and 2016. Accreditation for seven undergraduate programs is currently in progress. Recognized as a research centre by Andhra University in 2013, the institute is also listed under Sections 2(f) and 12(b) of the UGC Act. In 2015–16, ANITS achieved autonomy, enabling it to incorporate advancements in science, technology, and industry requirements into its curriculum. Accredited by NAAC and designated as a Skill Excellence Centre by the Government of Andhra Pradesh in 2017, the institute continues to uphold its mission of delivering high-quality education.

VISION AND MISSION STATEMENTS OF THE INSTITUTION:

Vision
To emerge as a world class technical institution.

Mission
To impart holistic technical education by providing
- The state-of-the-art infrastructure
- Exceptional technical and teaching expertise
- Best of human values

Campus and Physical Infrastructure

ANITS spans 4.54 hectares, thoughtfully developed with green concepts to promote sustainability. According to the institution's land management records, 7978.60 m² is allocated to built-up areas, while the remaining land is categorized as open spaces, including playfields, parks, and green belts.

Land Use Details:

Land Use Type	Extent (m²)
Total Area	45,484
Built-Up Ground Area	7,978

Campus Population

The campus supports a population of approximately 4,766 individuals, 4,636 of whom are day users. The breakdown of the campus population is as follows:

- Students: 92.02%
- Teaching Staff: 5.24%
- Supporting Staff: 2.72%

Green Campus & Green Audit Initiatives

As a leading institution in the region, ANITS is committed to fostering environmental awareness and sustainability among students and staff. The goal is to achieve a Carbon-Neutral Campus within five years, starting from 2020–21. To this end, the institution has initiated a comprehensive Green Audit alongside sustainability measures that extend beyond the recommendations of AICTE. These initiatives align with Sustainable Development Goals (SDGs), positioning ANITS as a model for other institutions.

The Green Audit responsibility has been assigned to the Green Audit Committee, under the guidance of the principal, to ensure effective implementation and goal attainment.

Scope, Objectives, and Strategy for ANITS Green Audit

A Green Audit is a vital tool for promoting sustainable practices, enhancing environmental quality, ensuring health and safety, conserving resources, and fostering a culture of sustainability within educational institutions. At ANITS, the scope and strategy of the Green Audit are designed to:

- Assess the current environmental state and compare it across years and peer institutions.
- Educate students and employees on environmental concerns.
- Identify areas for improvement and prioritize sustainable projects.

The audit framework establishes baseline data on environmental conditions and aims to embed sustainable practices into the institution's culture.

Objectives of the Green Audit

General Objectives:

To develop a baseline report on waste management, mitigate resource wastage, and foster sustainable practices within the campus and beyond, involving the community and public.

Specific Objectives:

- Monitor the institution's energy consumption patterns.
- Recommend sustainable energy and water conservation practices.
- Assess water usage and quality on campus.
- Identify sources and methods to manage various types of waste.
- Suggest measures to enhance biodiversity within the campus.

By implementing these objectives, ANITS seeks to embed sustainability into the learning and working environment, inspiring future engineers to contribute to a greener nation.

GREEN AUDIT SUMMARY RESULTS

The Green audit of 2023-2024 covers the period between June 2023 to May 2024.

1. LAND USE:

The campus spans **45,484 m²**, with **17.54%** under built-up area and **37.98%** designated for greenery and open spaces. Recent initiatives include:

- Expansion of landscaped areas by 10%.
- Development of an eco-park within the campus.

Land Use Type	Extent (m²)	Percentage (%)
Built-Up Ground Area	7,978.60	17.54
Parking Area	8,974.74	19.73
Tot-Lot + Playground Areas	5,306.16	11.67
Roads and Tracks	5,951.80	13.08

Land Use Type	Extent (m²)	Percentage (%)
Green/Open Spaces	17,272.70	37.98

The land use is highly balanced, aligning well with the norms for institutions of higher learning. Although the vacant site area was designated for greening, a significant portion of the open area—including roads, tracks, playgrounds, and more than 80% of parking spaces—remains exposed to the sky. This design promotes unrestricted airflow and facilitates efficient rainwater harvesting through natural percolation.

2. WATER

Recognizing the critical importance of water, ANITS has established a dedicated water management cell to oversee and optimize water usage across campus. Water is utilized for various purposes, including drinking, domestic activities, laboratory functions, housekeeping, and maintaining greenery. Given the absence of a public water supply, the institution relies solely on groundwater for its needs.

Currently, ANITS extracts approximately 40 KLD of water from four bore wells, supported by an above-ground storage capacity of 40 KLD. The average distribution of water across different uses is as follows:

S. No	Purpose	Quantity (KLD)	% of Total Usage
1	Drinking	6	15%
2	Other Domestic Uses	14	35%
3	Laboratories & Other Facilities	18	45%
4	Greenery	2	5%

The campus provides an average of 1.2 liters of drinking water per head, which is adequate for its population, as 99% of individuals remain on campus for less than 8 hours daily. This availability aligns reasonably well with the standard of 5 liters per head for 24-hour usage.

To ensure water quality, ANITS operates a reverse osmosis (RO) plant with an installed capacity of 6,000 liters/day, which produces approximately 10,000 liters/day of reject water

during a six-hour operation. Over half of this reject water is repurposed for floor cleaning, with the remainder utilized for watering greenery. Additionally, RO-treated water is shared with a neighbouring sister institution within the ANITS group.

To maintain high standards of water quality, the Department of Chemistry conducts quarterly analyses of RO water samples, examining all key parameters to ensure compliance with safety and usability standards.

3. ENERGY

ANITS is one of the few institutions in India to have pioneered in the energy conservation and use of renewable energy sources. Basically, it uses three types of Energy sources: (1) Electricity from the Public supply and (2) Electricity from the Own Solar plants and (3) Diesel (HSD).

An energy audit is a study of a plant, building or facility to determine how much energy is used and to identify methods for energy savings. Proper balancing in implementation of the new technologies and already existing technology provide the most hopeful prospects for the future. The opportunities lie in the use of existing renewable energy technologies, enhancing the energy efficiency and the distribution of these technologies.

Date collection for energy audit of Anil Neerukonda Institute of Technology and Sciences (ANITS) Campus for the period of April 2023 to March 2024 has been done by the team. This audit was over sighted to inquire about the convenience to develop the energy competence of the campus. This audit is essential to identify the energy proficient appliances/instruments. The data is collected from each classroom, laboratory and every room by considering the number of tubes, fans, ACs, electronic instruments, water purifiers, printers, xerox machines, pumps, projectors etc., present in each room
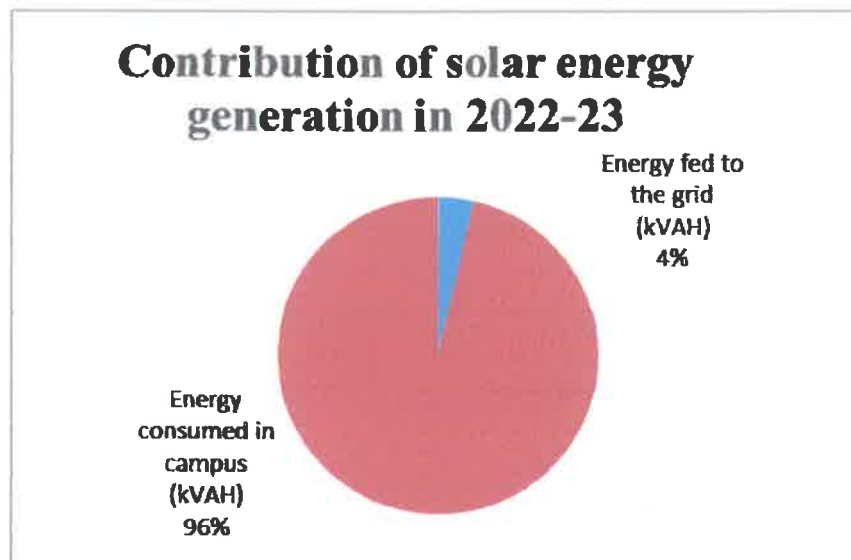
Institute has 450 kVA solar power generation system with 1364 panels installed and is connected to the grid. The energy units consumed from the public supply is exclusive of this power. Thus, addition of this power, accounts for a per capita production of 1963.85 Units/Annum. Highlights of the energy audit are

I.   The total connected load as per the present energy audit is 2496.51 kVA.

II.   The institute has 450 kVA solar power generation. The total solar energy generation in the year 2023-24 is 4,38,219 kVAh/Annum.

III.   The total actual energy consumption in the campus during 2023-24 is 9,73,352 Units/Annum.

IV.   The college has paid total 72,73,636/- Rs/Annum for the electricity bill in 2023-24 which is equivalent to 54.98 % of the actual energy consumed. This is due to the availability of solar plant in the campus.

V.   The institute has two capacitor banks of ratings 30 kVAR and 15 kVAR. The Average power factor maintained during the year is 0.97.

VI.   The institute has a 500 kVA diesel generator set to supply the back-up power.

The total energy consumed in 2023-24 is 9,73,352 Units/Annum. Out of which, the energy consumed from the grid is 5,90,486 Units/ Annum (60.67 % Out of total energy consumed) and energy consumed from solar system is 3,82,866 Units/ Annum (39.33 % Out of total energy consumed). The billed units in ANITS is 5,35,133 Units/Annum (i.e., 54.98 % Out of total energy consumed).

Contribution of actual energy consuption in 2023-24

- Energy consumed from solar unit (kVAH) 39%
- Energy consumed from grid (kVAH) 61%
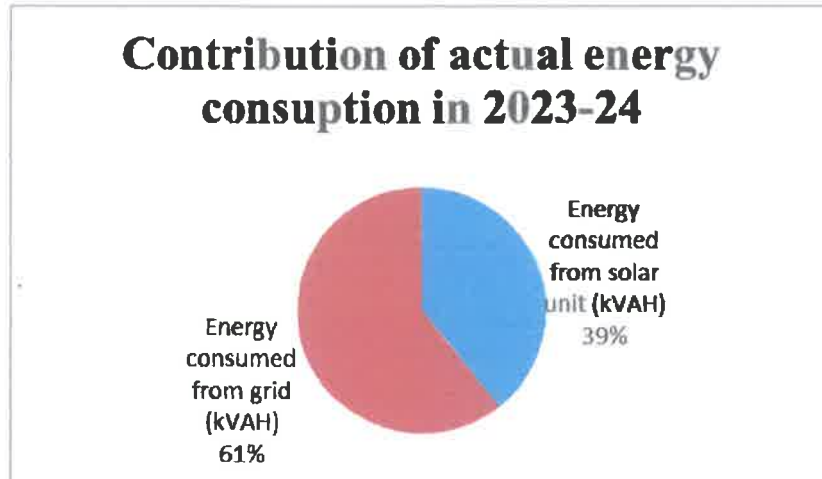
The solar system of ANITS has generation of 4,38,219 Units/Annum. Out of this 55,353 Units/Annum (i.e., 12.63%) are fed to the grid. The remaining 3,82,866 Units/Annum (i.e., 87.37 %) are used in the campus.

Contribution of solar energy generation in 2022-23

- Energy fed to the grid (kVAH) 4%
- Energy consumed in campus (kVAH) 96%

4. WASTE MANAGEMENT

Solid Waste Management

- Dry solid waste from various departments is collected daily in a centralized collection pit within the campus. Inspired by the Swachh Bharat Mission, a Twin-Bin system is implemented to segregate recyclable and biodegradable waste.

- Used papers and notebooks are collected at the end of each semester for recycling. This initiative is exclusively driven by students through various campus clubs.

- Any chemical or hazardous waste from laboratories is disposed of in strict compliance with established norms.

- The campus's Wi-Fi-enabled infrastructure ensures most communication is digital, significantly reducing paper usage.

- To minimize plastic usage, plastic cups, plates, and cutlery are banned within the campus.

- Organic waste is composted and repurposed as manure for campus greenery.

Liquid Waste Management

- A Sewage Treatment Plant (STP) with a capacity of 200 KL/day serves both the campus and hostel, treating wastewater for reuse in flushing and gardening.

- Additional STPs with capacities of 300 KLD and 200 KLD are available on ANH premises, handling wastewater from the hospital, institution, and hostel.

- The wastewater treatment process employs aeration to ensure effective purification.

- Liquid chemicals from the Chemistry and Environmental Engineering labs are safely disposed of following standard safety regulations.

E-Waste Management

- All computers, batteries, and electronic equipment are purchased under a buy-back agreement to ensure proper disposal and recycling of e-waste.

Waste Generation Overview

Wastes generated from academic and administrative divisions are categorized as follows:

Waste Type	Sources	Quantity (Per Day)	Disposal Method
Wet Waste	Dining Halls & Messes	60 kg/day	Composted
Paper & Board	Administrative & Academic	4.7 kg/day	Authorized Vendors
Metallic	All	0.21 kg/day	Authorized Vendors
Plastic	All	0.36 kg/day	Authorized Vendors
E-waste	All	0.2 kg/day	Authorized Vendors

Waste Management Practices

ANITS emphasizes the 5 R's principle (Reduce, Reuse, Recycle, Refuse, and Recover) to promote sustainable waste management. Key practices include:

- Placement of semi-closed waste bins at convenient locations in all buildings for dry waste collection.

- Large bins positioned at building entrances for wet waste disposal, which is cleared daily and composted.

- Dry wastes are cleared bi-weekly, segregated at a common site, and handed over to authorized vendors.

- Students are actively encouraged to innovate by analyzing and repurposing waste materials through team projects.

By integrating these practices, ANITS fosters a culture of environmental responsibility among students and staff, supporting the campus's journey toward sustainability and waste reduction.

5 Ecological Activities

Environmental and Sustainability Initiatives of ANITS is to realize its Vision of making its campus a Carbon Neutral campus and to empower its students and employees in addressing the environmental and sustainability challenges of the nation, introduced several activities to create awareness and educational activities. These activities are generally taken up at the department level, while some activities on certain days of international or national importance, the activities are taken up at the Institutional level.

1. **Swachh ANITS:** The programme was initiated at the Institutional level and coordinated by the NSS wing of the Institution. The programme aims at training the students in the Participatory Management of the Campus and creates awareness among the students on the Swatch missions of the country. The programme for the year was launched in August 2019 and continued till the end of the academic year. About 120 students (10 to 12 volunteers from each department) have participated in this programme.

2. **One student One plant:**

Department of Mechanical Engineering, ANITS Successfully organized "One student – One plant" on 11th March 2023. The Program was Organised under U TOO CAN Club. It was organised for inculcating the habit of plantation of saplings in the students. It was organised to understand the importance of trees and how trees protect ecological balance in nature.

3. **Save The Beaches:** ANITS, as part of its environmental initiatives organizes World Ozone Day every year on September 16th, to educate the young engineers on the importance of use of Ozone Depleting Substances in various technologies and gadgets. The programme is conducted at the Institute level.

Concluding Remarks and Audit recommendations

The institute exemplifies an environmentally friendly approach by utilizing a 450 kVA solar energy system, contributing to the eastern power grid, and employing LED bulbs for energy conservation. A robust solid waste management system, a 200 KL/day Sewage Treatment Plant (STP), and an e-waste management system are in place. The campus also boasts excellent water conservation facilities, including rainwater harvesting pits, a borewell recharge system, and wastewater recycling. Green campus initiatives and barrier-free, disabled-friendly facilities further demonstrate the institute's commitment to sustainability.

To reduce environmental pollution, the institute has adopted a vehicle-free policy for students. It fosters inclusivity by encouraging stakeholder participation through committees, NSS, and club activities. The institute organizes events to honor national significance and constitutional values, such as World Water Day, World Environment Day, International Yoga Day, and No Plastic Day, aligning with government initiatives like Swachh Bharat. Additionally, under the Unnat Bharat Abhiyan (UBA) scheme, two villages have been adopted.

The audit team commends the institute's well-planned layout, with 38% of the land designated for open use. However, there is scope to further optimize and document the utilization of open spaces. While the existing greenery is commendable in terms of coverage and numbers, enhanced planning could improve biodiversity, productivity, and carbon sequestration, advancing the goal of making the campus carbon neutral. Although waste management systems are operational, better documentation of metal, plastic, battery, and e-waste generation and disposal is recommended to improve overall efficiency and accountability.

GALLERY

Green ANITS Campus

Solar Energy panels

Borewells

Rainwater Harvesting Pits

Reverse Osmosis unit

Liquid Waste Treatment and Solid Segregation System

Segregation of waste material in the campus