

Sustainable Development goal

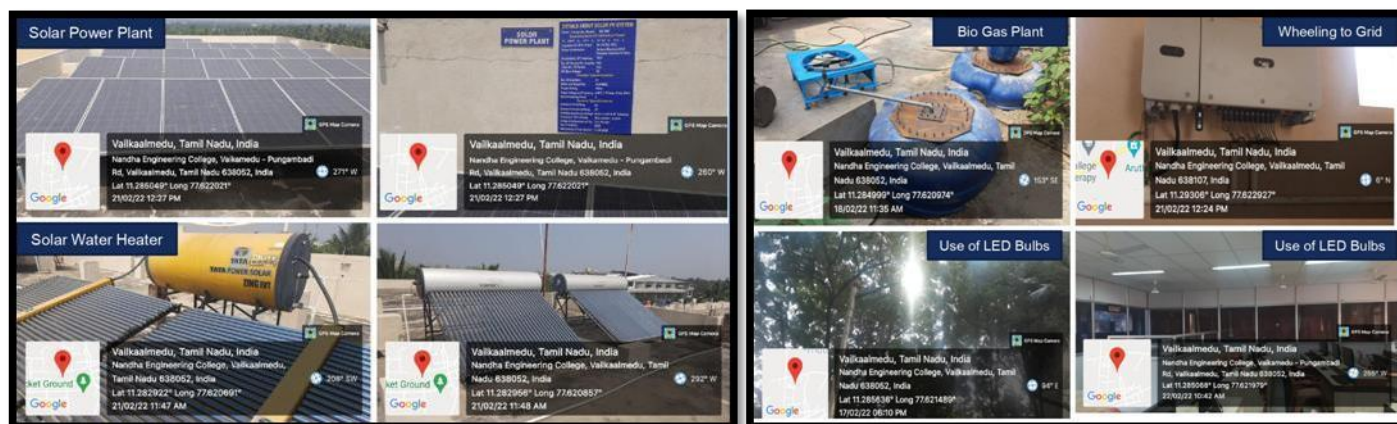
SDG 7: Affordable and clean energy

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7.1 The Institution has facilities for alternate sources of energy and energy conservation measures

7.1 The Institution has facilities for alternate sources of energy and energy conservation measures.

S.No	Description
1	Solar Energy
2	Biogas plant
3	Wheeling to the Grid
4	Sensor-based energy conservation
5	Use of LED bulbs/power efficient equipments



POLICY ON ENVIRONMENT AND ENERGY CONSERVATION

1. Introduction:

The Energy Conservation Policy of Nandha Engineering College is to manage energy in such an organized way so as to reduce the impact of loss of energy crisis on the environment. The policy implies to explore the renewable energy resources to reduce the burden of the government and to find out substitute natural resources as solutions to the energy crisis. The policy helps to entrench efficiency and to create environmental awareness, thereby

helps the citizens to realize the responsibilities and commitment in conserving of natural resources and limiting the usage.

2. Objective:

- To maximize the utilization of green energy
- To identify the cause for all forms of pollution and to make suitable solutions.
- To convert the campus into a renewable energy campus.
- To observe of various days of importance like world water day, environment day, etc

3. Policy Content and Guidelines

- Nandha Engineering College will promote the use of cost-effective, renewable energy sources whenever possible, both in new construction and existing building renovations.
- All buildings will continue to target energy efficiency improvement measures to the greatest extent through energy audits.
- Conduct awareness programmes among all the students and faculty member about the importance of energy conservation.
- Motivate students to do projects on Renewable Energy Sources and to assess the energy usage and to measure its impact on the environment.
- Monitor and control CO₂ emissions and take necessary steps to reduce it periodically.
- Advocating all the vehicle users to use eco-friendly vehicles, including bicycles, public transportation and use of pedestrian-friendly roads.
- Installing photovoltaic solar panels for the generation of alternate energy.
- Periodic maintenance of Solar panel to keep up the efficiency of producing electricity.
- Energy efficient LED bulbs by replacing higher wattage CFL bulbs.
- Cleaning the solar PV panel regularly to improve the power generation
- Conduct Energy audit every year by the external agencies to know the status of energy conservation and to proper energy management.
- Utilizing energy efficient green vehicles inside the campus.

- Maximizing the usage of Bio gas for cooking at Canteen
- Maintaining all the electrical equipment periodically.

4. Review of the policy:

- The status of various energy conservations will be obtained from reports of the auditing agencies and the corresponding measures will be taken for effective conservation of energy.
- Policy level changes also be done based on the audit report.

Alternative Energy resources and its Maintenance

Solar power plant

Percentage of power requirement of the Institute supplemented by 50 kW renewable solar energy power plant has been installed at the top floor of Block- IV with power earthing arrangements as per IE rule. Power rating of 50 kW solar energy power plant output is 250 units /day

Bio Gas Plant

To minimize the LPG utilization, a bio gas plant of 2000 liter capacity has been installed at the institute canteen by CiPD (Centre for Innovation and Product development cell) and the gas produced is used for cooking.

Solar Water Heater

Solar water heaters are installed both in boys and girls hostel.

LED Bulbs/ Power Efficient equipment

Energy efficient LED bulbs are placed in a phased manner in all the laboratories, class rooms and road sides.

Sensor Based Energy Conservation:

To regulate the utilization of water, sensor based devices are installed in the over head water tanks and in open well.

Maintenance:

A Software (SMART NANDHA) has been developed by the faculty members to make entries on the maintenance required and the estate office team is looking after the work and ensures timely completion.

7.2 Describe the facilities in the Institution for the management of the

Following types of degradable and non-degradable waste

Preamble:

The college is very keen in minimizing the waste and recycling it by passing through the scientific ways that enable the used materials to be recycled ensuring that less natural resources are used. Waste generated in the campus is segregated as solid waste, liquid waste and e-waste and taking the social clubs have played a prominent role in this by organizing various awareness programs, conducting tree plantations and various other activities. In our campus the following initiatives are taken towards the management of wastes. They are as follows:

Solid Waste Management:

For the collection of regular solid waste, garbage bins are kept at different places in the campus. Biodegradable organic wastes such as dry leaves, yard trimmings, and waste from kitchen are subjected to the composting process. To convert these wastes into soil additives, a Vermicompost pit has been constructed on a relatively small scale of 9x3x3 feet near Crop and Animal Husbandry Laboratory. The organic manure thus obtained is used for cultivation.

Liquid Waste Management:

Sewage Treatment Plant with the purification capacity of 2, 00,000 litres per day has been installed near Boys Hostel for treating the liquid waste which is being collected from college, hostel and food court. Nearly 1, 84,000 litres of water is discharged from the plant after purification. The recycled water is used mainly for gardening.

E-waste Management:

Electronic goods are put to optimum use; the minor repairs are done by the laboratory assistants but the major repairs are handled by the technical Assistant and are reused. The waste compact discs and other disposable non-hazardous items are used by students for

decoration during college fests as creative means of showcasing the waste management practice.

The Computer maintenance team identifies the e-waste that is accumulated in all departments on a regular basis and stores them in a specified place. The collected e-waste is sold to the proper agency for recycling.

Bio medical Waste management:

In the department of bio medical engineering, used needles and sharps are destroyed using an electrical device called Sharps and Needle destroyer.

Yellow bins are placed at several points inside the campus to collect used mask and other Bio waste materials.

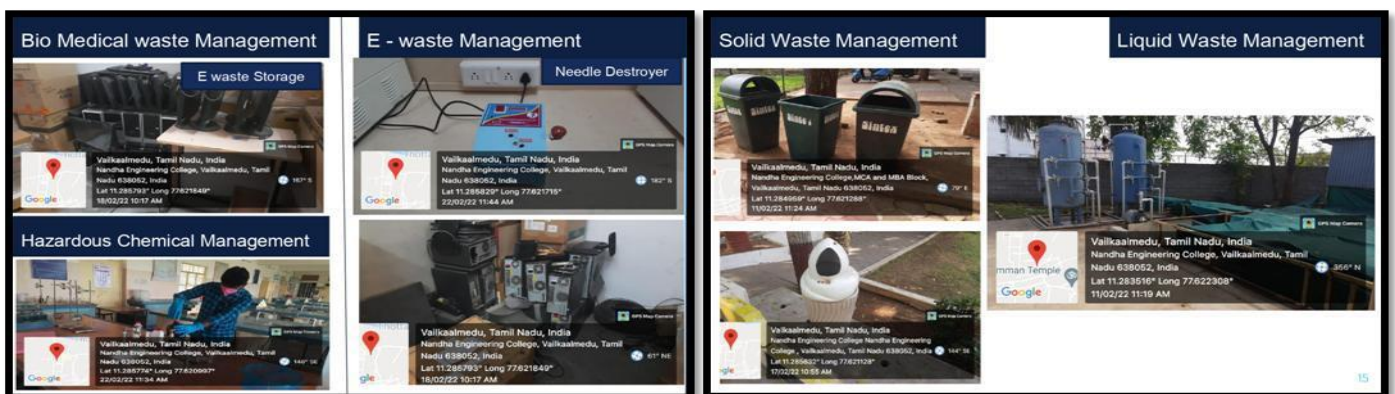
Water Recycling System:

Recycled water acts as an alternate for existing water supplies and be used to enhance water security, sustainability and resilience. Recycling water can be a significant part of an Institutional pollution prevention program.

Waste water from boy's hostel and mess is recycled in the waste water recycling plant and used for gardening, irrigation purposes and watering lawn. This reduces usage of fresh water supply. It has been designed with the inflow of 2 Lakhs litre per 24 hours and stock capacity of 1.80Lakhs litre and outflow capacity of 1.60 Lakhs litre per 24 hours.

Handling of Hazardous Chemicals and radioactive wastes

Policies are framed to manage the hazardous chemicals in chemical laboratories. Students and faculty members are instructed to use chemicals by following the standing operating procedures like handling chemical with face mask and gloves etc



WASTE MANAGEMENT POLICY

1. Introduction:

NEC strongly believes that the cleanness of the environment is one of the prime factors of education. A clean environment automatically boosts our self-confidence, learning ability and better focus. NEC has initiated, implemented, promoted and practically led environmentally sustainable practices in our college campus. The waste management reduces the effect of waste on the environment.

2. Objective:

- To keep our campus clean and healthy
- To create awareness of minimizing, reusing and disposal of waste
- To incorporate different strategy for different kind of waste.

3. Policy Content & Guidelines

- The system to ensure effective segregation, as well as its disposal, with the intent of diverting as much waste generated as possible away from the landfill and instead to recyclers and reuse.
- The bins will be placed according to the volume of the traffic as well as the estimated types of waste generated. Based on this the required number of bins, their placement and their sign ages can be arranged.
- The instructions about segregations and visible bins should be made prominent and effective communication and coordination to ensure that the bins are not full or overflowing, and that they are not displaced.
- The Bio gas plant supports the disposal of food waste.
- Vermicompost pit incorporate for solid waste management.
- E-waste bins for separates e-wastes.
- A separate system is incorporated for bio medical waste.

4. Execution of Activities:

- Seminars/ Workshops are conducted in regard of various waste management systems and the public awareness also done through Social clubs of various departments.
- That waste disposal records are maintained in the stock registers and the respective condemned items are handed over the waste management hub. MoU's are signed with appropriate contractors for removal and disposal of all waste items.

7.3 Water conservation facilities available in the Institution

7.3 Water Conservation facilities

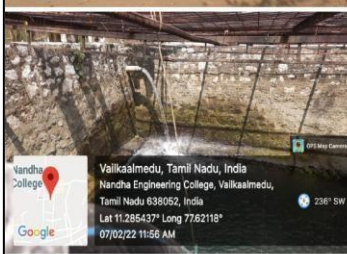
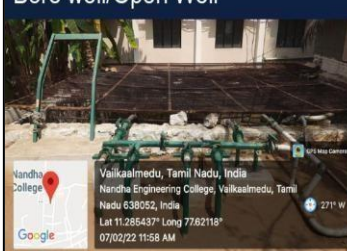
S.No	Description
1	Rain water harvesting
2	Borewell/Open well recharge
3	Construction of tanks and bunds
4	Waste water recycling
5	Maintenance of water bodies and distribution system in the campus

Rain Water Harvesting



S. No	Location of the Pit	Area of the Pit (Square Feet)	Depth (Feet)
1	Backside of Block - 4	7.5 sq. ft.	5 feet
2	Backside of Block - 4	7.5 sq. ft.	5 feet
3	Backside of Block - 4	7.5 sq. ft.	5 feet
4	Backside of Block - 4f	7.5 sq. ft.	5 feet
5	Backside of Block - 3	7.5 sq. ft.	5 feet
6	Backside of Block - 3	7.5 sq. ft.	5 feet
7	Backside of Block - 3	7.5 sq. ft.	5 feet
8	Backside of Block - 9	9 sq. ft.	6 feet
9	In front of Estate Office	84 sq. ft.	10 feet

Bore well/Open Well



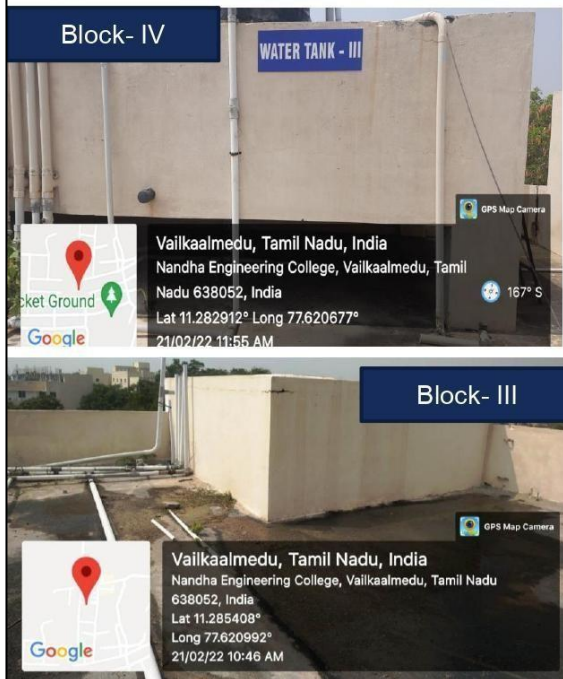
Water supply to the campus is done by three wells namely NEC well with the capacity of 10,80,000 litre is located

Near to Canteen. Well 1 with the capacity of **7,20,000 litre** and Well 2 with the capacity of **4,80,000 litre** are located near to outside the campus. There is a proper pipeline connection from the well 1 and well 2 they supply water to the NEC well. These three open wells supply water to various locations to satisfy the daily need of water in the campus.

Location of Water Bodies

S.No	Name	Location	Capacity (lit)
1	NEC Well	Near to Canteen	10,80,000
2	Well 1	Near to Outside the campus	7,20,000
3	Well 2	Near to Outside the campus	4,80,000

Tanks & bunds



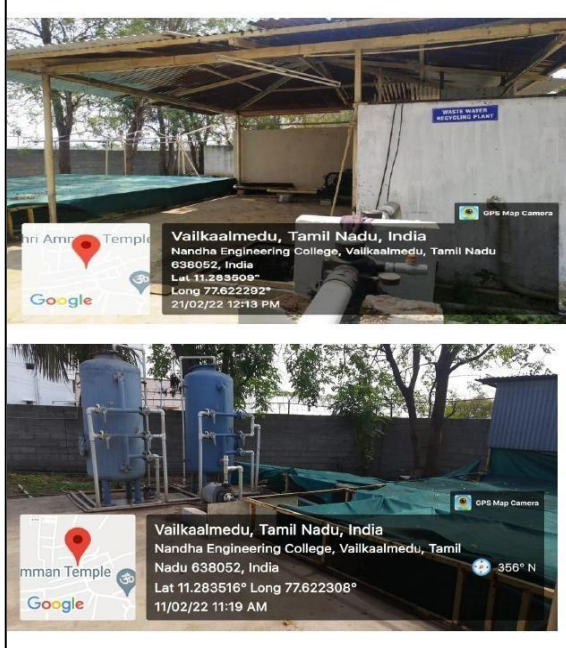
Location of Tanks & Capacity

Tank	Block	Capacity
Tank 1	Block II	24,000
Tank 2	Block III	30,000
Tank 3	Block IV	5,000
Tank 4	Block IX	24,000
Tank 5	Opposite to Block 7	30,000
Tank 1	NRI – I	24,000
Tank 2	NRI – II	24,000
Tank 3	NRI – III	5,000



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Waste Water Recycling

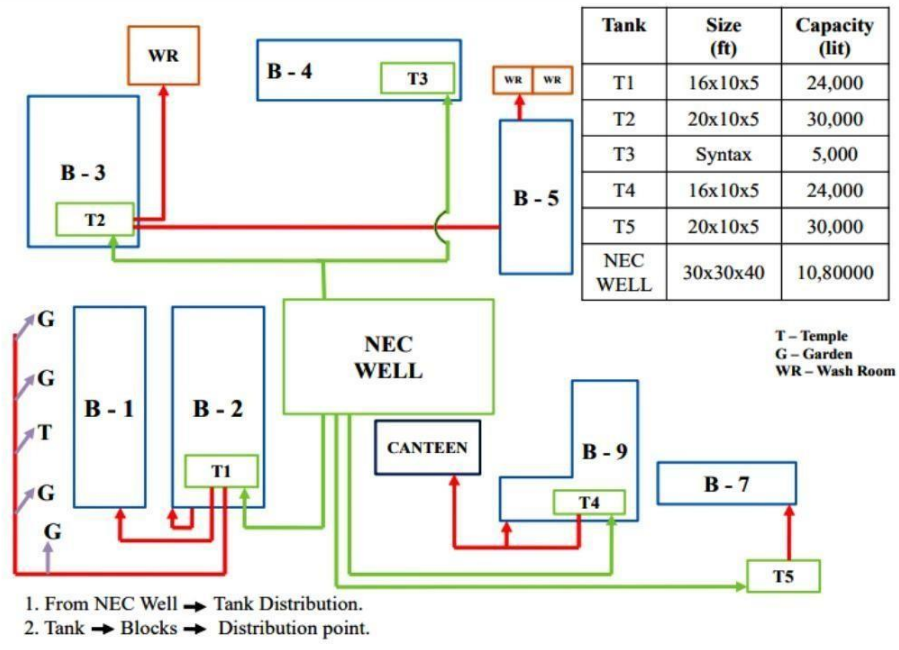


❖ Waste water from boy's hostel and mess is recycled in the waste water recycling plant and used for gardening, irrigation purposes and watering lawn. This reduces usage of fresh water supply.

❖ It has been designed with the **inflow of 2 Lakhs litre per 24 hours** and stock capacity of 1.80Lakhs litre and **outflow capacity of 1.60 Lakhs litre per 24 hours**

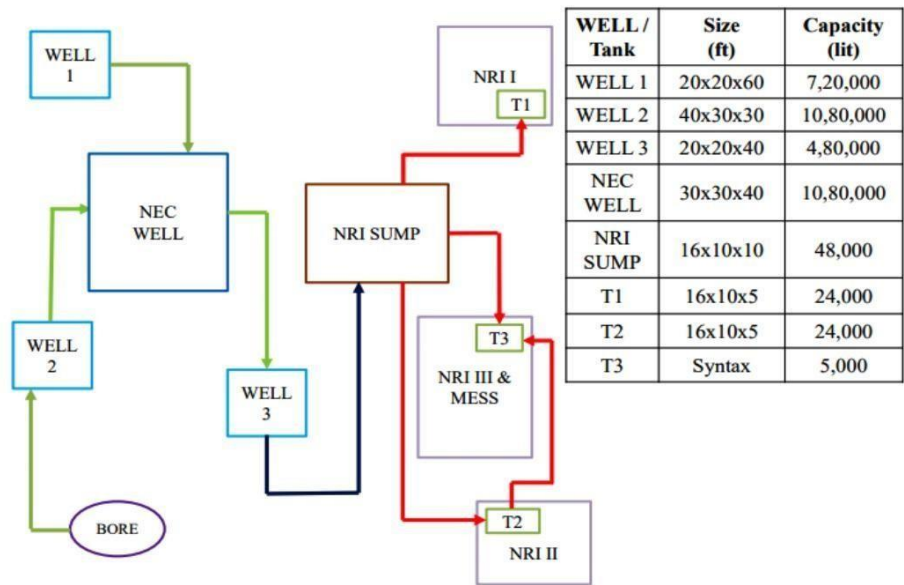
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Maintenance of water bodies & Distribution System



Maintenance of water bodies & Distribution System

WATER SOURCES AND DISTRIBUTION



Maintenance of water bodies & Distribution System



Location of Water Bodies

S.No	Name	Location	Capacity (lit)
1	NEC Well	Near to Canteen	10,80,000
2	Well 1	Near to Outside the campus	7,20,000
3	Well 2	Near to Outside the campus	4,80,000
4	Tank 1	Block II	24,000
5	Tank 2	Block III	30,000
6	Tank 3	Block IV	5,000
7	Tank 4	Block IX	24,000
8	Tank 5	Opposite to Block 7	30,000
9	Tank 1	NRI – I	24,000
10	Tank 2	NRI – II	24,000
11	Tank 3	NRI – III	5,000

7.4 Green campus initiatives

7.4 Green Campus Initiatives

S.No	Description
1	Restricted entry of automobiles
2	Use of Bicycles/Battery powered vehicles
3	Pedestrian Friendly pathways
4	Ban on use of Plastic
5	Landscaping with trees and plants

Green Campus Policy



NANDHA ENGINEERING COLLEGE

(AUTONOMOUS)

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Perundurai, Erode - 638052, Tamil Nadu, India. Email: principal@nandhaengg.org

Website: www.nandhaengg.org Phone: 04294-225585

GREEN CAMPUS AND ENVIRONMENT POLICY

Green Practice in Campus:

Institute's primary concern is about green practices for sustainable environment and inculcating empathy towards environment among students and staff. NEC has implemented digitization by promoting the usage of less quantity of paper in academic and administrative processes by effective waste management. Students are sensitized about green practices through the orientation programs, environmental studies class, poster competitions, practical assignments, celebrations like world Water day, Environmental day, etc.

The institute pays much attention on green practices by the following ways

- Restricted Entry of Automobiles
- Pedestrian friendly path ways
- Plastic free campus
- Paperless office
- Green landscaping with trees and plants
- Energy Conservation.




Dr.N.Rengasaban, B.Sc., B.Tech., M.E., Ph.D.,
F-77427-2005
NANDHA ENGINEERING COLLEGE
(Autonomous)
ERODE - 638 052.



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1. Restricted Entry of Automobiles

- Faculty and students are advised to park their vehicles in the parking space provided for them and are not entertained to park on the roads in the campus.
- Faculty and students commuting by two wheelers are instructed to wear helmets to ensure safety.
- Security guards are allotted duties to ensure not to parking vehicles in no parking areas.
- Placards are being placed in no parking areas.
- The Management provides transport facilities to both faculty and students. It also supports the faculty and students to use public transport or their own vehicle.

2. Pedestrian friendly roads

- NEC has taken special effort towards the construction and maintenance of the internal roads for pollution free campus.
- Faculty and the students are advised to use pedestrian friendly pathways for convenience and safety.




Dr.N.Rengarajan B.Sc., B.Tech., M.E., Ph.D.,
PRINCIPAL
NANDHA ENGINEERING COLLEGE
(Autonomous)
ERODE - 638 052.



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3. Plastic Free Campus

- Awareness program on Environment pollution and the effective ways to protect it is conducted by the students to the public.
- A 'No Plastic' awareness campaign is conducted by NSS at NEC to share the hazards of indiscriminate use of plastic. Being conscious towards the environment, Institute instructs the students to minimize the use of plastic.
- Faculty and student volunteers frequently monitor the dinning hall, washing area, canteen and other common places to avoid the use of plastics.
- Students are advised to use paper plates, and jute bags.
- Hazardous wastes are identified and disposed appropriately.

4. Paperless Office

NEC supports the Government of India's Digital India Program, which aims to transform India into a digitally empowered nation. NEC believes in going digital in every possible way and reduces the use of papers in academic and administrative processes. Reuse of papers for writing and printing is recommended in all departments. E-Notice practice is being followed by departments to disseminate information. Reformation Software is in use for hall booking, addressing the issues etc.




Dr. N. Rengarajan, B.Sc., B.Tech., M.E., Ph.D.
PRINCIPAL
NANDHA ENGINEERING COLLEGE
(Autonomous)
ERODE - 638 052.



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5. Green landscaping with Trees and Plants

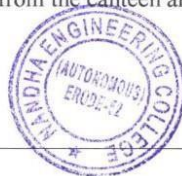
- Much attention was paid not to cut down the trees in campus while constructing buildings. Most of the buildings are constructed without demolishing trees in the campus. Thus the campus holds more than 75% of green cover.
- Eco –landscaping is designed and maintained in such manner that it saves time, money and energy. It contributes in reducing air, soil and water pollution.
- College has organized various activities on green practices for the benefit of society. Education on Environmental science is a part of the program to create awareness among students on environment and sustainability.

6. Energy Conservation

- The campus is beautifully landscaped in a lush green stretch of land and is free from air and noise pollution.
- Guidelines are provided to the students and faculty in the campus regarding conservation of the environment and saving energy.
- Rule of turning off the computers when not in use and turning off all the electrical equipments before leaving the class room/ lab/ campus is adopted to save energy. Solar water heaters are used in the hostels. It is recommended to replace all the fluorescent lamps in the campus with LED lamps.

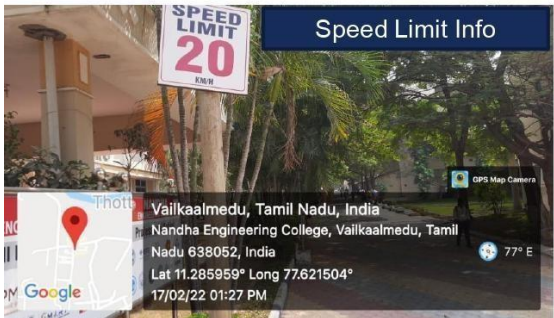
7. Waste water Recycling:

Recycled water from the canteen and other cooking areas in the campus is used for watering plants.



N. Rengarajan
Dr.N.Rengarajan, B.Sc., B.Tech., M.E., Ph.D
PRINCIPAL
NANDHA ENGINEERING COLLEGE
(Autonomous)
ERODE - 638052.

Restricted entry of automobiles



Usage of Bicycle/ Battery Powered Vehicles



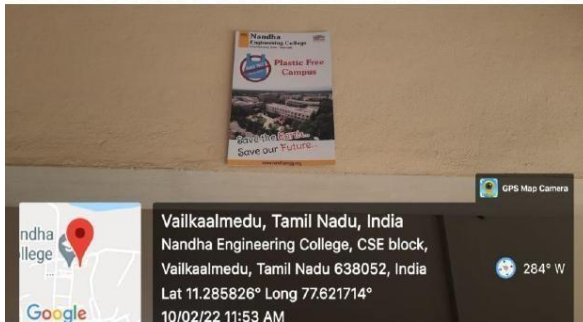
Pedestrian Friendly Pathways



Ban On Plastic



Landscaping with trees and Plant




Videos Link: Landscaping with Trees and Plants (You Tube)
<https://youtu.be/LtqIXopGUeg>

7.5 Quality audits on environment and energy are regularly undertaken by the institution

7.5 Quality Audit on Environment & Energy

S.No	Description
1	Green Audit
2	Energy audit
3	Environment audit
4	Clean and green campus recognitions/awards
5	Beyond the campus environmental promotional activities

Energy Conservation Policy



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Website: www.nandhaengg.org Phone: 04294-225585

Energy Conservation Policy


Introduction:
The Energy Conservation Policy of Nandha Engineering College is to manage energy in such an organized way so as to reduce the impact of loss of energy crisis on the environment. The policy implies to explore the renewable energy resources to reduce the burden of the government and to find out substitute natural resources as solutions to the energy crisis. The policy helps to entrench efficiency and to create environmental awareness, thereby helps the citizens to realize the responsibilities and commitment in conserving of natural resources and limiting the usage.

Objective:

- To maximize the utilization of green energy
- To identify the cause for all forms of pollution and to make suitable solutions.
- To convert the campus into a renewable energy campus
- To observe of various days of importance like world water day, environment day, etc

Policies:

- Conduct awareness programmes among all the students and faculty member about the importance of energy conservation.
- Motivate students to do projects on Renewable Energy Sources and to assess the energy usage and to measure its impact on the environment.
- Monitor and control CO₂ emission and take necessary steps to reduce it periodically.
- Advocating all the vehicle users to use eco-friendly vehicles, including bicycles, public transportation and use of pedestrian-friendly roads.
- Installing photovoltaic solar panels for the generation of alternate energy.
- Periodic maintenance of Solar panel to keep up the efficiency of producing electricity.
- Energy efficient LED bulbs by replacing higher wattage CFL bulbs.
- Cleaning the solar PV panel regularly to improve the power generation.



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- Conduct Energy audit every year by the external agencies to know the status of energy conservation and to proper energy management.
- Utilizing energy efficient green vehicles inside the campus.
- Maximizing the usage of Bio gas for cooking at Canteen
- Maintaining all the electrical equipment periodically.

Energy , Green & Environment Audit – Certificates (2021)

RAM KALAM -CENTRE FOR ENERGY CONSULTANCY & TRAINING
CHENNAI COIMBATORE ERODE
 (Regt. Office No. 8, VPK Garden, Coimbatore-641 062,
 Mobile: +91-99420 14544, 80567 19372, Email: ramkalamcect@gmail.com)
 (GST No. 33AAZFR8890A1ZN)

CERTIFICATE FOR ENERGY AUDIT PROCESS

This is to certify that, we have conducted a detailed **ENERGY AUDIT** in **NANDHA ENGINEERING COLLEGE (AUTONOMOUS)**, Erode - Perundurai Main Road, Vaikkaalmedu, Erode - 638 052, Tamil Nadu, India on **25 MARCH 2021**. The audit team has awarded **2.1 Energy Conservation Program (ENCON)** and the summary of the Energy Audit Process is given below.

Description/Year	2018-17	2017-18	2016-19	2015-20	2006-21
Annual Electricity Consumption (kWh)	5,46,025	3,15,685	5,05,261	2,06,376	1,27,008
Annual LPG Consumption (kg)	99,780	37,488	42,468	34,001	13,883
Annual Wood Consumption (Tons)	131.2	110.0	118.8	113.3	41.3

Summary of Energy Conservation (ENCON) Programs

S. No.	Description	Present	After	Savings
1.	Annual Energy Consumption	5,46,265 kWh + 43,048 kg of LPG + 139 Tons of Wood	27,633 kWh + 36,972 kg of LPG + 86.3 Tons of Wood	36,233 kWh + 6,076 kg of LPG + 52.8 Tons of Wood
2.	Annual Energy Cost	Rs. 92.0 Lakhs	Rs. 48.6 Lakhs	Rs. 43.4 Lakhs
3.	Initial Investment Required	-	-	Rs. 5.0 Lakhs
4.	Simple Payback Period	-	-	Nearly 5.8 Years

Equipment's/Systems Audited:

- Electrical System & Network
- Lighting, Fan & Air Conditioning System
- Inverter, UPS & Battery System
- Motors & Water Pumping Systems
- Boiler and Steam Distribution System
- LPG & Wood Consumption

Note: The Energy Conservation Programs are presented in the Audit Report.

Thank You

Audit Conducted and Verified by:

Dr. S.R. SIVARASU, Ph.D.,
 BEE Certified Energy Auditor (EA-27295)
 Lead Auditor - ISO 14001: EMS
 IGBC - AP, GRIHA - CP
 Mobile: 80567 19372, 99420 29172
 E-Mail: ramkalamcect@gmail.com

Green Audit 2021

RAM KALAM -CENTRE FOR ENERGY CONSULTANCY & TRAINING
CHENNAI COIMBATORE ERODE
 (Regt. Office No. 8, VPK Garden, Coimbatore-641 062,
 Mobile: +91-99420 14544, 80567 19372, Email: ramkalamcect@gmail.com)
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CERTIFICATE FOR GREEN AUDIT PROCESS

This is to certify that, we have conducted a **GREEN AUDIT** in **NANDHA ENGINEERING COLLEGE (AUTONOMOUS)**, Erode - Perundurai Main Road, Vaikkaalmedu, Erode - 638 052, Tamil Nadu, India on **25 MARCH 2021**. This audit process investigates the following activities:

- Coverage of mature trees (nearby 334 trees available in the college campus).
- Availability of mature plants and improvement of Air Quality
- Publication certificates for all transport vehicles
- Innovative ways to harvest rain water (both from buildings and in road runoff)
- Initiatives taken to promote Green coverage inside the college campus
- Medical plant gardening inside the campus for future planning
- Analysis of Roofing Solar PV Plant (60 kW Grid Interactive Model)
- Assessment of Solar Thermal Hot Water system in boy's hostel
- Identification of expansion of green coverage for planting more trees
- Survey on bio-diversity plan for improvement of Birds, Reptiles and Amphibians
- Possibilities to implement various Renewable Energy Systems for regular activities (Like Solar hot water system, Biogas generation, waste to electricity, waste to wealth etc.)

(Note: The detailed Campus Greenery Coverage & Initiatives are presented in the Audit Report)

Thank You

Audit Conducted and Verified by:

Dr. S.R. SIVARASU, Ph.D.,
 BEE Certified Energy Auditor (EA-27295)
 Lead Auditor - ISO 14001: EMS
 IGBC - AP, GRIHA - CP
 Mobile: 80567 19372, 99420 29172
 E-Mail: ramkalamcect@gmail.com

Energy Audit 2021

RAM KALAM -CENTRE FOR ENERGY CONSULTANCY & TRAINING
CHENNAI COIMBATORE ERODE
 (Regt. Office No. 8, VPK Garden, Coimbatore-641 062,
 Mobile: +91-99420 14544, 80567 19372, Email: ramkalamcect@gmail.com)
 (GST No. 33AAZFR8890A1ZN)

CERTIFICATE FOR ENVIRONMENTAL AUDIT PROCESS

This is to certify that, we have conducted an **ENVIRONMENTAL AUDIT** in **NANDHA ENGINEERING COLLEGE (AUTONOMOUS)**, Erode - Perundurai Main Road, Vaikkaalmedu, Erode - 638 052, Tamil Nadu, India on **25 MARCH 2021**. This audit process highlights the present CO₂ emission and methods adopted to neutralize the same in the college campus.

Environmental System: CO₂ Balance Sheet (2019-21)

S. No.	Description	Annual Usage	CO ₂ Emission (Tons/Annun)	Description	Annual Usage	CO ₂ Neutralized (Tons/Annun)
1.	Diesel	2,52,219 Litres	524.0	Solar Thermal System	14,470 kWh	11.9
2.	Electricity Usage	5,16,689 kWh	268.4	Mature Trees	324 Nos	7.1
3.	LPG Consumption	99,780 kg	119.3	Total Neutralized	-	19.0
4.	Wood	131 Tons	240.3			
5.	Total Emission	-	1,152.0	Total Neutralized	-	19.0

Balance CO₂ to be Neutralized = 1,133.0 Tons/Annun

(Note: Amount of energy utilized from the solar thermal (2,090 LTR) is being considered into the electrical equivalent. The diesel consumption includes both for DG and transport application)

Environmental System: CO₂ Balance Sheet (2019-18)

S. No.	Description	Annual Usage	CO ₂ Emission (Tons/Annun)	Description	Annual Usage	CO ₂ Neutralized (Tons/Annun)
1.	Diesel	2,54,133 Litres	670.9	Solar Thermal System	14,470 kWh	11.9
2.	Electricity Usage	5,16,689 kWh	268.9	Mature Trees	324 Nos	7.1
3.	LPG Consumption	97,466 kg	112.4	Total Neutralized	-	19.0
4.	Wood	132 Tons	269.9			
5.	Total Emission	-	1,322.2	Total Neutralized	-	19.0

Balance CO₂ to be Neutralized = 1,303.2 Tons/Annun

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Environment Audit 2021

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Energy , Green & Environment Audit – Report


ENERGY, ENVIRONMENT & GREEN AUDIT REPORT

DETAILS OF THE CLIENT
NANDHA ENGINEERING COLLEGE (AUTONOMOUS)
 Erode - Perundurai Main Road, Vaikkaalmedu,
 Erode - 638052, Tamil Nadu, India



DATE OF AUDIT
 25 MARCH 2021


AUDIT CONDUCTED AND SUBMITTED BY
 RAM KALAM CENTRE FOR ENERGY CONSULTANCY AND TRAINING
 (Chennai + Coimbatore + Erode)
 Mobile: +91-99420 14544 (Whatsapp) E-mail: ramkalamcect@gmail.com



Audit Report 2021


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DETAILS OF THE CLIENT
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 Erode - Perundurai Main Road, Vaikkaalmedu,
 Erode - 638052, Tamil Nadu, India



DATE OF AUDIT
 15 JULY 2020
 (Audited and Accounted from June-2019 to March-2020)


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Audit Report 2020


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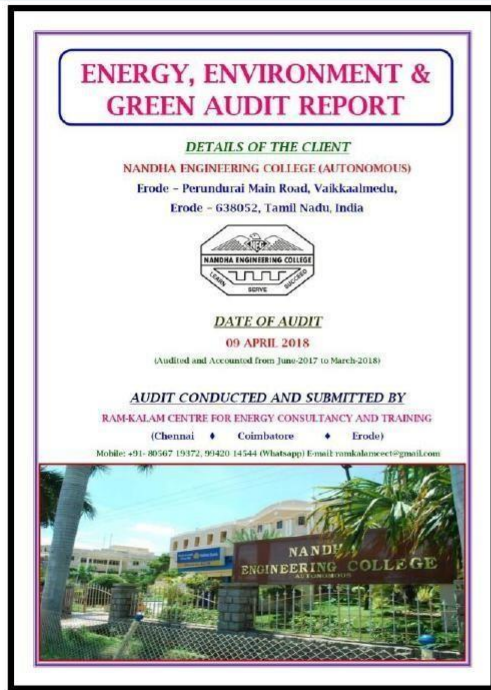
DATE OF AUDIT
 10 APRIL 2019
 (Audited and Accounted from June-2018 to March-2019)

AUDIT CONDUCTED AND SUBMITTED BY
 RAM KALAM CENTRE FOR ENERGY CONSULTANCY AND TRAINING
 (Chennai + Coimbatore + Erode)
 Mobile: +91-99420 14544 (Whatsapp) E-mail: ramkalamcect@gmail.com

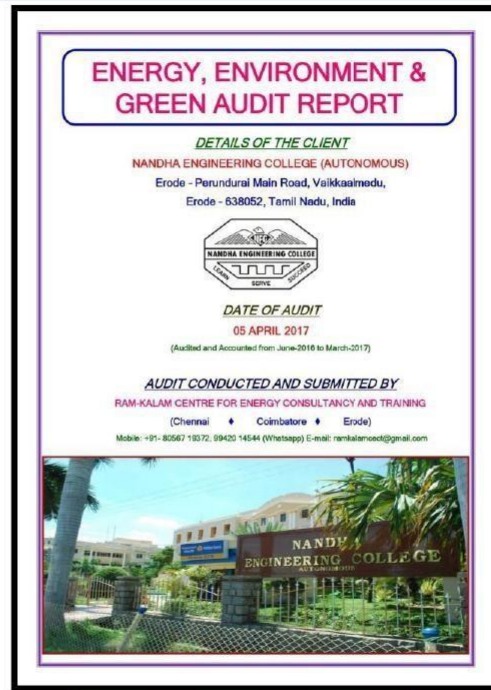


Audit Report 2019

Energy , Green & Environment Audit – Report



Audit Report 2018



Audit Report 2017

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Awards & Recognitions



AICTE- Jal Sakthi Abhiyan



Certificate from MGNCRE

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Beyond the campus environmental promotional activities

DATE	ACTIVITY	VENUE	STRENGTH
17.08.2019	Cleaning Activity	Nasiyanur	85
14.09.2019	Cleaning and Tree plantation	Kathirampatti near Nasiyanur	95
21.09.2019	Tree plantation and seed collection and packing	Erode	82
19.10.2019	Dengue prevention	College Campus	25
19.10.2019	Collection and packing of seeds	Erode railway colony	63
24.12.2019	Tree Plantation	Thudupathi	25
23 & 24.01.2020	Mass cleaning of SIPCOT	SIPCOT, Perundurai	175
26.02.2020	Blood Donation Camp	College Campus	106
28 & 29.02.2020	Survey at Birds Sanctuary Vellode	Vellode	12
07.03.2020	Village Cleaning	Kullampalayam Village near Seenapuram	80
11.03.2020	Awareness on Corona Virus (COVID 19)	College Campus	2000

