



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)

CERTIFICATE FOR ENERGY-ENVIRONMENT-GREEN AUDIT PROCESS

This is to certify that, we have conducted an ENERGY-ENVIRONMENT-GREEN AUDIT in NANDHA ENGINEERING COLLEGE (AUTONOMOUS), Erode - Perundurai Main Road, Vaikkaalmedu, Erode - 638 052, Tamil Nadu, India on [REDACTED]. The description of the audit process is given below.

S. No.	Description	Parameters
1.	Present Annual Energy Consumption	3,48,025 kWh + 39,780 kg of LPG
2.	Proposed % of Energy Savings	10.0 % Electrical + 5.0 % LPG
3.	Proposed Annual Energy Savings	34,803 kWh + 1,989 kg of LPG
4.	Proposed Financial Savings	Rs. 4.1 Lakhs
5.	Initial Investment Required	Rs. 6.0 Lakhs
6.	Simple Payback Period	Nearly 1.5 Years

Analysis of Environment Audit Process and CO₂ Balance Sheet:

S. No.	CO ₂ Emission (Tons/Annum)			CO ₂ Neutralization (Tons/Annum)		
	Description	Annual Usage	CO ₂ Emission	Description	Annual Usage	CO ₂ Neutralized
1.	Diesel	2,02,278 Litres	534.0	Solar Thermal System	14,470 kWh	11.9
2.	Electrical Energy	3,48,025 kWh	285.4			
3.	LPG	39,780 kg	119.3	Mature Trees	324 Nos	7.1
4.	Wood	131 Tons	249.3			
5.	Total Emission		1,188.0	Total-Neutralized		19.0
Balance CO ₂ to be Neutralized = 1,168.0 Tons/Annum						

Recommendations of the Audit Process:

1. Reduce the LPG consumption by regularly clean the burners
2. Decrease the LPG consumption by arresting the leakages on the distribution pipes.
3. Foot valve of all the submersible and open well pipes must be cleaned at regular intervals and this ensure i) free flow of water and ii) reduced power consumption.
4. Awareness programmes must be conducted to all the students and staffs. Disseminate the success stories on achieved energy conservation.
5. Restrict the use of single use plastics inside the college campus
6. Create an awareness among the students not to use the plastic items inside the campus
7. To conduct an Indoor Lighting Audit and asses the illumination level at various places



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Equipment's/Systems Audited:

• Electrical System & Network	• Motors & Water Pumping Systems
• Lighting, Fan & Air Conditioning System	• Boiler and Steam Distribution System
• Inverter, UPS & Battery System	• LPG & Wood Consumption
• Diesel Consumption (Vehicles + DG)	• Solid & E-Waste Handling & Management
• Usage of Chemical, Salts & Acids	• RO Plant, Water Distribution System & STP
• Coverage of mature trees	• Pollution certificates for all transport vehicles
• Rain Water Harvesting	• Survey on Bio-diversity

(Audited and Accounted from June-2016 to March-2017)

Audit Conducted and Certified by

S.R. Sivarasu

(Dr. S.R. SIVARASU)

Dr. S.R. SIVARASU, Ph.D.,
BEE Certified Energy Auditor (EA-27299)
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ERODE - 636 052.

**CERTIFICATE FOR ENERGY-ENVIRONMENT-GREEN AUDIT PROCESS**

This is to certify that, we have conducted an **ENERGY-ENVIRONMENT-GREEN AUDIT** in **NANDHA ENGINEERING COLLEGE (AUTONOMOUS)**, Erode - Perundurai Main Road, Vaikkaalmedu, Erode - 638 052, Tamil Nadu, India on 0 [REDACTED]. The description of the audit process is given below.

S. No.	Description	Parameters
1.	Present Annual Energy Consumption	3,15,685 kWh + 37,468 kg of LPG
2.	Proposed % of Energy Savings	10.0 % Electrical + 5.0 % LPG
3.	Proposed Annual Energy Savings	31,569 kWh + 1,873 kg of LPG
4.	Proposed Financial Savings	Rs. 3.8 Lakhs
5.	Initial Investment Required	Rs. 6.0 Lakhs
6.	Simple Payback Period	Nearly 1.6 Years

Analysis of Environment Audit Process and CO₂ Balance Sheet:

S. No.	CO ₂ Emission (Tons/Annum)			CO ₂ Neutralization (Tons/Annum)		
	Description	Annual Usage	CO ₂ Emission	Description	Annual Usage	CO ₂ Neutralized
1.	Diesel	2,54,123 Litres	670.9	Solar Thermal	14,470 kWh	11.9
2.	Electrical	3,15,685 kWh	258.9			
3.	LPG	37,468 kg	112.4	Mature Trees	324 Nos	7.1
4.	Wood	110 Tons	209.0			
5.	Total Emission		1,251.2	Total-Neutralized		19.0
Balance CO ₂ to be Neutralized = 1,232.2 Tons/Annum						

Recommendations of the Audit Process:

1. Battery voltage of each UPS must be measured and monitored. This ensures good practices on UPS & battery maintenance.
2. Prepare and adhere a cleaning schedule for UPS (both inside and outside the cabinet) and ensure proper heat dissipation
3. Conduct some kind of awareness programmes on Energy Conservation to all the stake holders.
4. Segregation of different types of waste has to be done at source level
5. Establish an MoU with the third party to safely dispose the wastes



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Equipment's/Systems Audited:

• Electrical System & Network	• Motors & Water Pumping Systems
• Lighting, Fan & Air Conditioning System	• Boiler and Steam Distribution System
• Inverter, UPS & Battery System	• LPG & Wood Consumption
• Diesel Consumption (Vehicles + DG)	• Solid & E-Waste Handling & Management
• Usage of Chemical, Salts & Acids	• RO Plant, Water Distribution System & STP
• Coverage of mature trees	• Pollution certificates for all transport vehicles
• Rain Water Harvesting	• Survey on Bio-diversity

(Audited and Accounted from June-2017 to March-2018)

Audit Conducted and Certified by

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S. No.	Description	Parameters
1.	Present Annual Energy Consumption	3,05,261 kWh + 42,466 kg of LPG
2.	Proposed % of Energy Savings	10.0 % Electrical + 5.0 % LPG
3.	Proposed Annual Energy Savings	30,526 kWh + 2,123 kg of LPG
4.	Proposed Financial Savings	Rs. 4.0 Lakhs
5.	Initial Investment Required	Rs. 6.0 Lakhs
6.	Simple Payback Period	Nearly 1.5 Years

Analysis of Environment Audit Process and CO₂ Balance Sheet:

PS. No.	CO ₂ Emission (Tons/Annum)			CO ₂ Neutralization (Tons/Annum)		
	Description	Annual Usage	CO ₂ Emission	Description	Annual Usage	CO ₂ Neutralized
1.	Diesel	2,42,657 Litres	640.6	Solar Thermal	14,470 kWh	11.9
2.	Electrical	3,05,261 kWh	250.3			
3.	LPG	42,466 kg	127.4	Mature Trees	324 Nos	7.1
4.	Wood	119 Tons	225.7			
5.	Total Emission		1,244.0	Total-Neutralized		19.0
Balance CO ₂ to be Neutralized = 1,225.0 Tons/Annum						

Recommendations of the Audit Process:

1. Conversion of Fluorescent lamps into Energy Efficient LED saves good amount of energy
2. Measure the earth resistance at regular interval and maintain within the standard.
3. Observe the voltage drop between supply point and load end and ensure that the voltage drop must be minimum
4. Voltage drop at the load end can be improved by load end capacitors compensation
5. Energy usage and CO₂ emission must be reduced using proper conservation methods
6. Regularly test the pollution level of the college owned vehicles



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S. No.	Description	Parameters
1.	Present Annual Energy Consumption	3,05,376 kWh + 34,901 kg of LPG
2.	Proposed % of Energy Savings	10.0 % Electrical + 5.0 % LPG
3.	Proposed Annual Energy Savings	30,538 kWh + 1,745 kg of LPG
4.	Proposed Financial Savings	Rs. 3.8 Lakhs
5.	Initial Investment Required	Rs. 5.0 Lakhs
6.	Simple Payback Period	Nearly 1.3 Years

Analysis of Environment Audit Process and CO₂ Balance Sheet:

S. No.	CO ₂ Emission (Tons/Annum)			CO ₂ Neutralization (Tons/Annum)		
	Description	Annual Usage	CO ₂ Emission	Description	Annual Usage	CO ₂ Neutralized
1.	Diesel	2,23,021 Litres	588.8	Solar Thermal	14,470 kWh	11.9
2.	Electrical	3,05,376 kWh	250.4			
3.	LPG	34,901 kg	104.7	Mature Trees	324 Nos	7.1
4.	Wood	113 Tons	215.3			
5.	Total Emission		1,159.2	Total-Neutralized		19.0
Balance CO ₂ to be Neutralized = 1,140.2 Tons/Annum						

Recommendations of the Audit Process:

1. Prepare a schedule to clean the air filters of AC indoor units at regular intervals
2. Observe the performance of the AC unit before and after air filter cleaning
3. Convert the common switches used for lights and fans into single controlled system
4. Compensate the electrical distribution losses by connecting load end capacitors
5. Provide training to the transport staffs to reduce the fuel consumption
6. Create a policy for chemical, acids and salts for safe storage, handling and disposal
7. Plan for scientific way of waste disposal must be adopted
8. Paste water and energy saving slogans at appropriate places



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9. The food waste must be weighted and marked in a record before keeping into the digester unit. This must be checked with the amount of gas generated using suitable calculation and check with the designed output

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(Audited and Accounted from June-2019 to March-2020)

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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

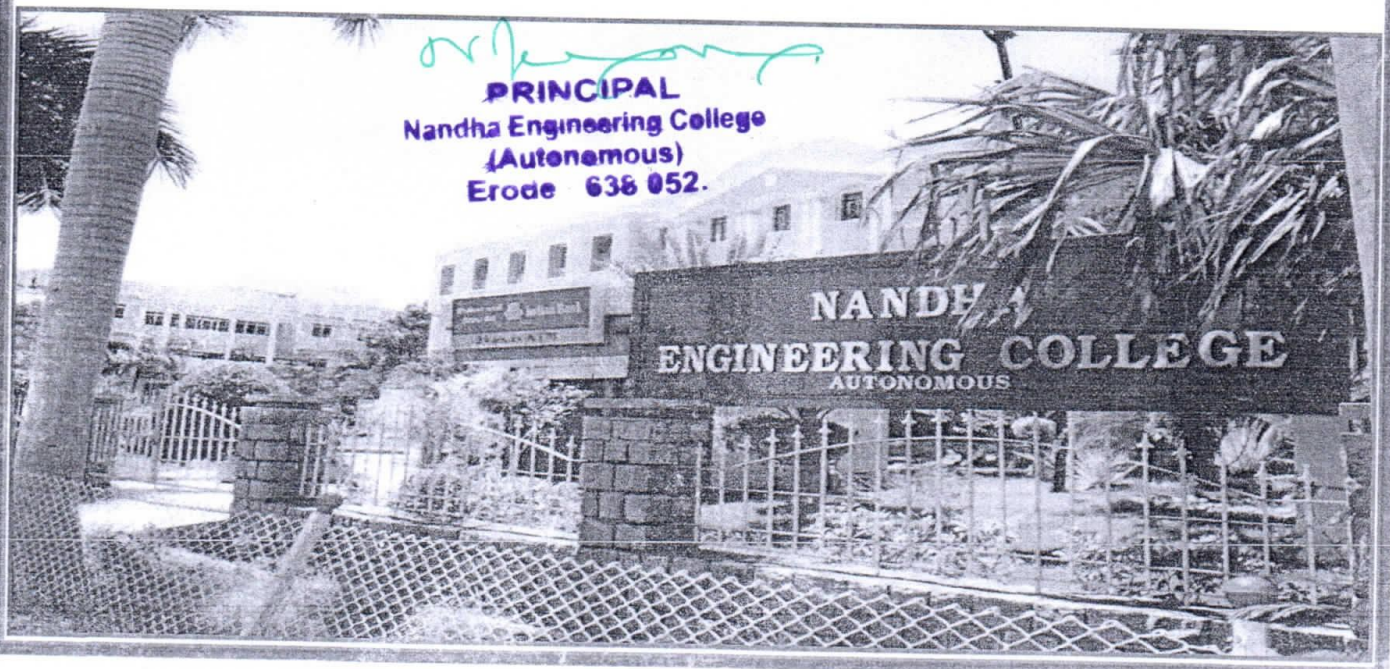
25 MARCH 2021

AUDIT CONDUCTED AND SUBMITTED BY

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ACKNOWLEDGEMENT

RAM-KALAM CENTRE FOR ENERGY CONSULTANCY AND TRAINING, Coimbatore – 641 062 is thankful to the Management, Principal, Faculty and Technical team members of **NANDHA ENGINEERING COLLEGE (AUTONOMOUS)**, Erode – Perundurai Main Road, Vaikkaalmedu, Erode – 638052, Tamil Nadu, India for providing an opportunity to conduct a detailed Energy, Environment and Green Audit process in the college premises.

It is our great pleasure which must be recorded here that the Management of **NANDHA ENGINEERING COLLEGE (AUTONOMOUS)** extended all possible support and assistance resulting in through completion of the audit process. The audit team appreciates the cooperation and guidance extended during the course of site visit and measurements. We are also thankful to all those who gave us the necessary inputs and information to carry out this very vital exercise of green audit.

Finally, we offer our sincere thanks to all the members in the engineering division/ technical/non-technical divisions and office members who were directly and indirectly involved with us during collection of data and while conducting field measurements.

Management Team Members

Thiru. V. SHANMUGAN	Chairman, Sri Nandha Educational Trust
Thiru. S. NANDHAKUMAR PRADEEP	Secretary, Sri Nandha Educational Trust
Thiru. S. THIRUMOORTHY	Secretary, Nandha Educational Institutions
Dr. N. RENGARAJAN	Principal, Nandha Engineering College (Autonomous)
Dr. J. SENTHIL	Director, Nandha Engineering College, Autonomous

Audit Team Members

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