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NAVSAHYADRI GROUP OF INSTITUTIONS
FACULTY OF MANAGEMENT
Approved by AICTE New Delhi
Affiliated to Savitribai Phule Pune University
Address: - Sr. No. 69,70,71 Naigaon Nasarapur Pune, Maharashtra 412213.
Website: https://www.navsahyadri.edu.in/**E- mail-** director@navsahyadri.edu.in

POLICY DOCUMENT ON ENVIRONMENT AND ENERGY USAGE.

Policy for Green Campus/ Energy/Waste/Water management and conservation

Academic Year 2023- 2024

Navsahyadri Group of Institutes NESGI PUNE

Dr. M. V. Dalvi
Principal
NESGI, Faculty of Engineering
Gat No.69,70,71,Naigaon, Tal. Bhor, Dist. Pune

IQAC Coordinator

POLICY DOCUMENT ON ENVIRONMENT AND ENERGY USAGE.

Policy for Green Campus/ Energy/Waste/Water management and conservation.

The NGI is committed to sustainable development in all its endeavors. Within its scope, the program aims to enhance energy conservation and utilization by promoting socially responsible practices.

Policy Statement:

The primary goal of NGI's Environment and Energy Usage Policy is to manage energy systematically to minimize its environmental impact. This policy is mandatory for all parts of the institution and applies to all stakeholders and activities within the organization.

NGI is committed to creating a clean and green campus by promoting sustainable and eco-friendly practices both on campus and beyond. The institution focuses on responsible waste management, water conservation, and exploring renewable energy resources as alternatives to address the energy crisis. By integrating these practices into daily operations, NGI aims to enhance efficiency and environmental awareness, reinforcing its commitment to conserving natural resources and reducing their usage. The environment and energy policy will guide these efforts, helping to embed sustainability into everyday activities and uphold our dedication to resource conservation.

Objectives:

- To increase awareness about environmental issues.

- To understand individual responsibilities in energy conservation.
- To implement effective waste management procedures.
- To minimize waste production across all campus activities and programs.
- To initiate and promote water management and conservation practices.
- To encourage and adopt green practices both on campus and in the broader community.
- To maintain cleanliness and sanitation throughout the campus.
- To provide a pollution-free, healthy environment for all.

Plan of implementation/ Practices

NGI is dedicated to sustainable development in all its efforts. To this end, the following areas will be prioritized for streamlining practices and procedures for environmental and energy conservation:

A. Energy conservation and management.
B. Waste management -Solid, Liquid & E-Waste Management
C. Water Conservation and Management.
D. Clean & Green Campus.
E. Paperless operating procedures.
F. Ban on single-use plastics on the Campus.
G. Taking up awareness initiatives and environment-centric activities.

A. Energy conservation and management.

- Install and use LED bulbs throughout the campus to conserve energy.
- Invest in energy-efficient equipment to reduce power consumption.
- Raise awareness about the impact of small actions by displaying "Save Energy" labels and posters in various campus locations.
- Encourage the use of natural lighting and ventilation whenever feasible.
- Implement ongoing measures to continuously enhance energy consumption practices.
- Ensure the availability of necessary resources to support and achieve our conservation

goals.

B. Waste management -Solid, Liquid & E-Waste Management

- Implement two-way waste segregation at source across the campus.
- Adopt the 4 R's: Reduce, Reuse, Recycle, and Refuse whenever possible.
- Minimize waste production throughout campus activities.
- Install and use sanitary napkin incinerators and disposal machines to manage waste effectively.
- Follow eco-friendly practices in daily operations and programs.
- Opt for bags made from eco-friendly materials.
- Use eco-friendly items and materials for packaging, decorations, gifts, and mementos during events and programs.
- Engage in recycling and upcycling activities to make the best out of waste.
- Encourage a paperless environment by promoting technology-based teaching and administrative practices.
- Develop and maintain a systematic waste management mechanism for effective waste handling and disposal.

C. **Water Conservation and Management.**

- Utilize rainwater recharge pits for effective water conservation and management.
- Conduct regular repairs and maintenance of leaks in taps and pipes.
- Plant indigenous and low-water-demanding plants throughout the campus.
- Raise awareness about water conservation by displaying "Save Water" labels and posters in various campus locations.
- Organize water conservation activities to educate faculty and students about the importance of water conservation.
- Replace sanitary fixtures with water-efficient faucets and nozzles to reduce water usage.

D. Clean & Green Campus.

- Enhance the campus landscape by improving the existing green cover with indigenous trees and plants.

- Conduct a tree plantation drive to increase green spaces and biodiversity.
- Establish a nature club to promote environmental awareness and activities.
- Reduce local air pollution by encouraging the use of eco-friendly transportation options such as bicycles, public transit, and pedestrian-friendly routes.
- Ensure cleanliness and sanitation are maintained consistently across the campus.

E. Paperless operating procedures.

- Transition to a paperless office by adopting e-office practices, including communication through emails and virtual platforms.
- Utilize digital storage solutions such as Google Drive for document management.
- Create subject-specific WhatsApp groups and Google Classrooms for effective communication and sharing of course content.
- Establish and maintain college social media handles on platforms like Instagram and YouTube, College Duniya, Shiksha Portal, IIT Spoken Tutorial, Inter Shala, London Business School.
- Develop and maintain a fully functional college website to support online presence and information dissemination.

F. Ban on single-use plastics on the Campus.

- Aim for a plastic-free campus by banning single-use plastics on the premises.
- Conduct sensitization programs to educate about the harmful effects of single-use plastics.
- Adopt the 4 R's: Reduce, Reuse, Recycle, and Refuse wherever possible.
- Implement eco-friendly practices in daily activities and events.
- Choose bags made from eco-friendly materials.
- Prefer eco-friendly items and materials for packaging, decorations, gifts, and mementos during various events and programs.

G. Taking up awareness initiatives and environment-centric activities.

- Students are encouraged to undertake various awareness-raising activities and projects in their Internship as part of their assignments.
- Provide opportunities for employees and students to participate in initiatives that

contribute to environmental protection and sustainability.

Conclusion:

The strategies and procedures outlined above may be adjusted based on evolving needs and circumstances. This policy will be communicated to all students, staff, and employees of the college. All stakeholders are expected to adhere to the policy to help ensure the campus remains green, clean, and eco-friendly.

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Navsahyadri Group of Institutes NESGI PUNE

ENVIRONMENTAL AUDIT REPORT

NAVSAHYADRI EDUCATION SOCIETY'S GROUP OF INSTITUTIONS

Naigaon (Nasarapur), Pune 412 213

Year: 2023-24

Prepared by:

ENGRESS SERVICES
Yashashree, 26, Nirmal Bag Society
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: engress123@gmail.com

Registration Certificates: UDYAM, MEDA, ASSOCHAM GEM-CP, ISO: 9001 & 14001:

Government of India
Ministry of Micro, Small and Medium Enterprises

UDYAM REGISTRATION CERTIFICATE

UDYAM REGISTRATION NUMBER	UDYAM-MH-26-0135636
NAME OF ENTERPRISE	ENGRESS SERVICES

S.No.	Classification Year	Enterprise Type	Classification Date
1	2023-24	Micro	03/02/2024
2	2022-23	Micro	26/06/2022
3	2021-22	Micro	27/07/2021

TYPE OF ENTERPRISE *	
MAJOR ACTIVITY	SERVICES
SOCIAL CATEGORY OF ENTREPRENEUR	GENERAL

NAME OF UNIT(S)

S.No.	Name of Unit(s)
1	Engress Services

OFFICAL ADDRESS OF ENTERPRISE	Flat/Door/Block No.	26	Name of Premises/ Building
	Village/Town	Pune	Block
	Road/Street/Lane	Lokmanya Nagar,Nirmal Baug Soc	City
	State	MAHARASHTRA	District
	Mobile	8767447244	Email:

DATE OF INCORPORATION / REGISTRATION OF ENTERPRISE	13/04/2021
DATE OF COMMENCEMENT OF PRODUCTION/BUSINESS	13/04/2021

S.No.	NIC 2 Digit	NIC 4 Digit	NIC 5 Digit	Activity
1	70 - Activities of head offices; management consultancy activities	7020 - Management consultancy activities	70200 - Management consultancy activities	Services

DATE OF UDYAM REGISTRATION	27/07/2021

GEM Certificate

ASSOCHAM

ASSOCHAM hereby certifies that

Mr. A Y Mehendale

has successfully passed the

Green and Eco-friendly Movement Certified Professional Test (GEM CP)

with

"Excellent Performance"

on

06 June, 2022

Pankaj R. Dhurkar
Chairman, GEM

GEM CP 22705

Deepak Sood
Secretary General, ASSOCHAM

Certificate of Registration

This is to Certify that
Quality Management System of

ENGRESS SERVICES

has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope :

Certificate No : 23EQAC13
Initial Registration Date : 27/03/2023
Date of Expiry : 26/03/2026
1st Surv. Due : 27/02/2024
Issuance Date : 27/03/2023
2nd Surv. Due : 27/02/2025

Director

Magnitude Management Services Pvt. Ltd.

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandry, Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: mea@mahaurja.com, Web: www.mahaurja.com

ECN/2022-23/CR-43/1709 10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with *MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)* under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : M/s Engress Services
Yashshree, 26, Nirmal Bag Society,
Near Mahitagan English School,
Parvati, Pune – 411 009.

Registration Category : *Empanelled Consultant for Energy Conservation Programme for Class 'A'*

Registration Number : MEDA/ECN/2022-23/Class A/EA-32.

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and cancelling the registration, if the information is found incorrect.
- This empanelment is valid till **09th May, 2024** from the date of registration, to carry out energy audits under the Energy Conservation Programme.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

Certificate of Registration

This is to Certify that
Environmental Management System of

ENGRESS SERVICES

has been assessed and found to conform to the requirements of

ISO 14001:2015

for the following scope :

Director

Magnitude Management Services Pvt. Ltd.

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ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Navsahyadri Education Society's Group of Institutions for awarding us the assignment of Environmental Audit of their Campus for the Year: 2023-24.

We are thankful to all staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. Navsahyadri Education Society's Group of Institutions uses Energy in the form of **Electrical Energy** used for various Electrical Equipment, office & other facilities.

2. Pollution due to Institute Activities:

- **Air pollution:** Mainly CO_2 on account of Electricity Consumption
- **Solid Waste:** Bio degradable Garden Waste, Paper & Plastic Waste
- **Liquid Waste:** Human liquid waste

3. Present Energy Consumption & CO_2 Emission:

No	Particulars	Value	Unit
1	Energy Purchased	**60515**	kWh
2	Annual CO_2 Emissions	**56.28**	MT

4. Usage of Renewable Energy & CO_2 Emission Reduction:

- The Institute has installed Roof Top Solar PV Plant of Capacity **15 kWp.**
- Energy Generated by Solar PV Plant in 2023-24 is **18000 kWh**
- Annual Reduction in CO_2 Emissions in 2023-24 is **16.74 MT.**

5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	**63**	**39**	**51**
2	Minimum	**56**	**34**	**44**

6. Indoor Lux & Noise Level Parameters:

No	Parameter/Value	Lux Level	Noise Level, dB
1	Maximum	**236**	**46.3**
2	Minimum	**209**	**43**

7. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Organic Waste	Provision of Bio Composting Bed
3	Liquid Waste	Provision of Septic Tank
4	E waste	Recommended to dispose of through Authorized Agency.

8. Rain Water Management:

The Rain water falling on the terrace is gathered and is used to increase the Underground Water Table.

9. Environment Friendly Initiatives:

- Tree Plantation in the campus.
- Creation of awareness on Water Conservation Display of Posters

10. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.93 Kg** of CO_2 into atmosphere
2. **1 kWp** Solar PV system generates **4 kWh** of Electrical Energy per Day
3. Annual Solar Energy Generation Days: **300 Nos**
4. CO_2 emission is computed based on Electrical Energy purchased
5. Energy consumption is computed based on Load Utilization Factor

11. References:

- For CO_2 Emission computation: www.ccd.gujarat.gov.in
- For Solar PV Energy Generation: www.solarroftop.gov.in
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI Quality Standards: www.cpcb.com

ABBREVIATIONS

AQI	:	Air Quality Index
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
MT	:	Metric Ton
CO_2	:	Carbon Di Oxide
ISHRAE	:	The Indian Society of Heating, Refrigerating & Air conditioning Engineers
CPCB	:	Central Pollution Control Board
NSS	:	National Service Scheme
PM	:	Particulate Matter

CHAPTER-I
INTRODUCTION

1. Important Definitions:

1.1. Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.2. Environmental Audit: Definition:

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.2 Key Study Points:

No	Particulars
1	Study of Present Resource Consumption & CO_2 Emission
2	Study of Usage of Renewable Energy
3	Study of Indoor Air Quality
4	Study of Indoor Lux & Noise Level
5	Study of Water Management
6	Study of Waste Management Practices
7	Study of Environment Friendly Practices

1.3 Institute Location Image:

CHAPTER-II

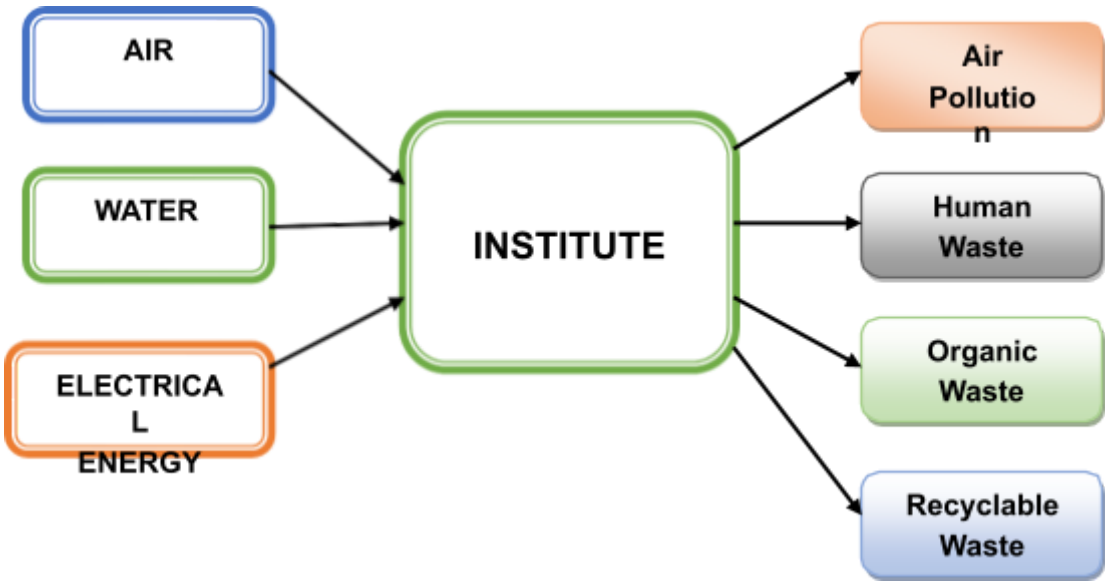
STUDY OF RESOURCE CONSUMPTION & CO_2 EMISSION

The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the Institute System & Environment as under.

Chart No 1: Representation of Resource Requirement & Waste of a Institute:



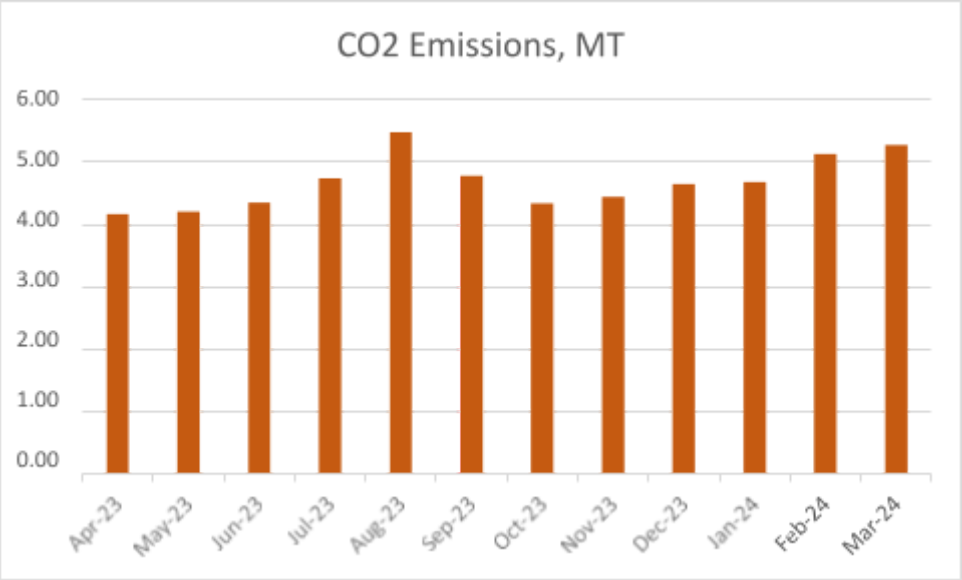
Now we compute the Generation of CO_2 on account of consumption of Electrical Energy. The basis of Calculation for CO_2 emissions due to Electrical Energy is as under.

- **1 kWh** of Electrical Energy releases **0.93 Kg of CO_2** into atmosphere

Table No 1: Study of Purchase of Energy & CO_2 Emissions: 23-24:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-23	4480	4.17
2	May-23	4525	4.21
3	Jun-23	4678	4.35
4	Jul-23	5100	4.74
5	Aug-23	5900	5.49
6	Sep-23	5147	4.79
7	Oct-23	4668	4.34
8	Nov-23	4780	4.45
9	Dec-23	4998	4.65
10	Jan-24	5036	4.68
11	Feb-24	5525	5.14
12	Mar-24	5678	5.28
13	Total	60515	56.28
14	Maximum	5900	5.49
15	Minimum	4480	4.17
16	Average	5042.92	4.69

Chart No 2: Month wise CO_2 Emissions:



CHAPTER III
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed Roof Top Solar PV Plant of Capacity **15 kWp**
We now calculate the reduction in CO_2 Emission due to Solar PV Plant.

Table No 2: Computation of Reduction in CO_2 Emission:

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	15	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**18000**	kWh
5	1 kWh of Electrical Energy is equivalent to	0.93	Kg of CO_2
6	**Annual Reduction in CO_2 Emission = (4) * (5) /1000**	**16.74**	**MT**

Photograph of Roof Top Solar PV Plant:

CHAPTER IV
STUDY OF INDOOR AIR QUALITY

1. **Air:** The common name given to the atmospheric gases used in breathing and photosynthesis.

2. **Air quality** is a measure of the suitability of air for breathing by people, plants and animals.

3. **Air Quality Index: Air Quality Index (AQI)** is a number used by government agencies to measure the **Air Pollution** levels and communicate it to the population.

In this Chapter, we present three important Parameters: **AQI**- Air Quality Index, **PM-2.5**- Particulate Matter of Size 2.5 micron and **PM-10**- Particulate Matter of Size 10 micron

Table No 3: Indoor Air Quality Parameters:

No	Location	AQI	PM2.5	PM10
1	A-218	60	36	48
2	A-313	61	37	49
3	A-408	56	34	44
4	Tutorial Room	58	35	45
5	Library	63	39	51
	Maximum	**63**	**39**	**51**
	Minimum	**56**	**34**	**44**

Table No 4: Air Quality Index Values & Concentration of PM 2.5 & PM10: (By CPCB):

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

Conclusion:

From the above measured values, we conclude that the observed values of AQI, PM-2.5 & PM-10 are in the **Satisfactory Range**, as per the guidelines given by Central Pollution Control Board.

CHAPTER V
STUDY OF INDOOR LUX & NOISE PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit. The Parameters include: **Lux Level and Noise Level.**

Table No 5: Study of Indoor Comfort Condition Parameters:

No	Location	Lux Level,	Noise Level, dB
1	A-218	219	45.9
2	A-313	236	44.8
3	A-408	217	46.3
4	Tutorial Room	223	45
5	Library	209	43
	Maximum	**236**	**46.3**
	Minimum	**209**	**43**

Recommended Lux & Noise Level: As per BEE & ISHRAE Guidelines:

A) Noise Level Reference:		
No	**Location**	**Noise Level Range, dB**
1	Offices	45-50
2	Occupied Class Room	40-45
3	Libraries	35-40
B) Reference Lux Level, Lumens:		
1	For Class Rooms	**200 Plus**

2	For Reading Rooms	**200 Plus**

Conclusion:

From the above measured values, we conclude that:

- The Noise Level is within the prescribed Limit
- The Lux Level at various locations is Okay

CHAPTER VI
STUDY OF RAIN WATER MANAGEMENT

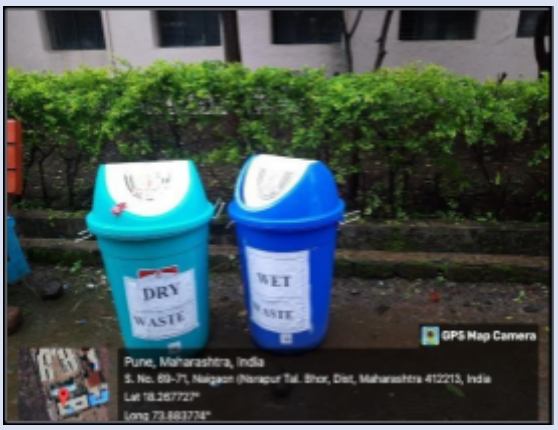
The Institute has implemented the Rain Water Management Project. The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to increase the Underground Water Table.

Photograph of Rain Water Collecting Pipe:

CHAPTER-VII
STUDY OF WASTE MANAGEMENT

In this Chapter, we present the Waste Management Practices, followed by the Institute.

Details of Waste Management Practices:

No	Head	Observation	Photograph
1	**Solid Waste**	Segregation of Waste at Source: Provision of Waste Collection Bins	**Waste Collection Bins:** 
2	**Organic Waste**	Provision of Bio Composting Bed: For conversion into Bio Compost	**Bio Composting Bed:** 
3	**Liquid Waste**	Provision of Septic Tank & Periodic Cleaning	
4	**E Waste**	Dispose through Authorized Agency	

CHAPTER-VIII
STUDY OF ECO-FRIENDLY PRACTICES

In this Chapter, we present the Eco-Friendly Practices, followed by the Institute.

Details of Eco-Friendly Practices:

No	Head	Observation	Photograph
1	**Tree Plantation**	Internal Tree Plantation in the Campus	**Internal Tree Plantation:** 
2	**Creation of Awareness among Stake Holders**	Display of Poster on Water Conservation	

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Action Taken Report on Environmental Usage and Promotional Activities conducted beyond the Campus

Index

Sr. No.	Details
1	Report on environmental promotional activities conducted beyond the campus with geo tagged photographs with caption and date.
2	Meri Mati Mera Desh
3	World Nature Conservation Day
4	World Environment Day

Report on Environmental Promotional Activities

1. Meri Mati Mera Desh

The college organise many beyond the campus environmental promotional activities like Meri Mati Mera Desh. The campaign held at premises on 09.10.2023.

Figure 1 Meri Mati Mera Desh

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Navsahyadri Group of Institutes
NESGI
PUNE

2. World Nature Conservation Day

World Nature Conservation Day was observed on 28th July 2023. The theme chosen for World Nature Conservation Day 2023 was 'Forests and Livelihoods: Sustaining People and Planet'. World Nature Day occupies a pivotal space in the global calendar due to its dedication to tackling some of the planet's most pressing environmental concerns. Its primary objectives includes:

Raising Climate Change Awareness:

This initiative is resolute in its mission to combat ignorance surrounding climate change, ensuring that people worldwide grasp the urgency of the situation and the need for immediate action.

Promoting Eco-Friendly Practices:

World Nature Day fervently encourages the adoption of eco-friendly practices, ranging from recycling and reducing plastic usage to embracing sustainable lifestyles. It serves as a rallying point for individuals and communities to make environmentally conscious choices.

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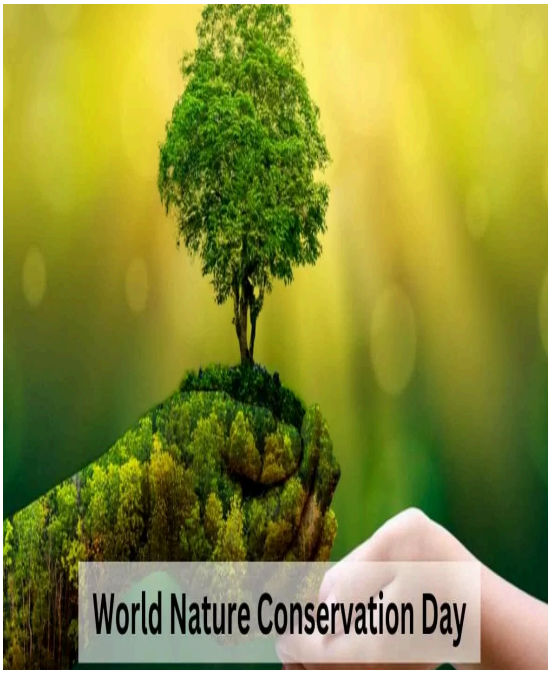
World Nature Conservation Day



Dr. M. V. Dalvi

Principal

NESGI, Faculty of Engineering

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3. World Environment Day

To celebrate World Environment Day College Organized Rally to spread awareness about Global warming and its side effects among the society.

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Achievements related to Green Campus initiatives

Navsahyadri Group of Institute Degree and PG College is a quality conscious college. It protects its own environment with its green campus initiatives and maintains a pollution free green and clean campus. Environment development is its basic work with the educational policies implemented on the campus.

The Institution is committed to managing its campus in accordance with responsibilities towards promoting sustainable environment. These responsibilities can be demonstrated within the following areas:

- **Green Environment and Clean Campus**
- **Solid Waste Management**
- **E -Waste Management**
- **Liquid Waste Management**
- **Soil Management**

- **Maintenance of Water Bodies**
- **Water Conservation and Management**
- **Paperless operating procedure**
- **Landscaping with Trees and Plants)**
- **Roof Gardening Initiative**
- **Energy Use and Conservation**
- **Noise Pollution Management**
- **Air Pollution Management**
- **Restricted Use of Automobiles**
- **Ban on Single-use Plastics on the Campus**
- **Display Boards on College Campus**
- **Green Audit**

Green Environment and Clean Campus

The students are given strict instructions to maintain the campus clean and it is reflected in their handbooks. Several Quotes related to the importance of clean and green environment are displayed on the campus.

A gardener and full time adequate support staff are appointed for the maintenance of litter free clean and Green Campus.

Solid Waste Management

The college pays dedicated focus to see that minimal waste is generated in the campus. Solid waste is segregated as bio degradable and non-degradable and handed over to. All Departments and classrooms are provided with dustbins for dry wastage disposal. Segregation of waste into dry and wet waste from the separately allotted dustbins is done in strategic locations, thus maintaining the Campus clean and Eco- friendly

Use of sanitary disposal machine is one of the best practices adopted by the college towards eco-friendly disposal mechanisms.

E -Waste Management

With the proliferation of electronics also comes the challenge of their proper disposal. The College is grappling with ways to efficiently and cost-effectively handle the issue of electronic waste, or e-waste, on campus. It's normal for people to discard of products due to normal wear and tear, but technological advancements have accelerated e-waste growth as students, faculty and administrators frequently upgrade to better gadgets. This surge has forced college administrators to carefully examine and address the environmentally responsible disposal of these products on a campus-wide scale.
The college adopts most scientific and eco-friendly e-waste disposal mechanisms such as

AMC is maintained to periodically review the effective functioning of CPU's and Monitors and expert recommendations are followed to dispose the same in the market. All Electronic waste CPU's, Hard disks, Laboratory Equipment scrap is sent periodically to the market for sale. The institution has a contract for approved E-Waste Management and Disposal facility in order to dispose E-waste in scientific manner. Obsolete workable computers, printers and other equipment discarded by departments are sold as scrap. The cartridges of printers are refilled outside the college campus. UPS Batteries are recharged and repaired by the suppliers.

B. Suitable budget is allocated to upgrade the systems.

Liquid Waste Management

Next to air, water is the most important element for the preservation of life. Water is a finite commodity which, if not managed properly, will result in shortages in the near future. Water conservation can go a long way to help alleviate these impending shortages.
Students are made aware that conserving water is equivalent to conserving their future. Drinking water from the tap, and refilling bottle as often as the students need is one of the best practice followed at Navsahyadri Group of Institute .Disposable bottles are not allowed.

In house - plumbers attend promptly to fix leakages and wastage of water.

Soil Management

The college has started vermicomposting culture during 2023-24 on 89 Sq. feet (356 cubic feet). In this process the college is able to produce 90kgs vermi compost approximately per month and after completion of this process of vermicomposting, the same is used as manure. The main benefits of this process is to reduce the waste in the environment and also it works as a cost saving measure.

The main objective of this culture is to understand the benefits of composting and organic farming. Solid waste from bird droppings, food leftovers from the canteen is treated and converted into vermi compost in the vermi compost pit.

Maintenance of Water Bodies

The Institution aims to provide the best services to the students in all the possible ways, in education facilities, in infrastructure and in basic necessities like water. The institution functions with the help of ground water. There are two bore wells with 80 feet and 150 feet respectively and with the municipal water which comes in every alternate day. The institution has a good storage of ground water, drinking water and water for cleaning purpose. 50000 liters capacity underground tank is exclusively set for Fire-Safety and it gets filled with rain water. And for drinking purpose, the Institution has R.O purifier, which purifies and separates drinking water and waste water. That waste water is used for cleaning purpose. Every floor is equipped with Sintex and water coolers. Overall, the campus has 11 Water coolers, which are installed in every floor to meet the students need. Apart from the ground water and municipal water, the College has rain water harvesting pits, which function efficiently during rainy season.

It is made mandatory to clean and disinfect water holding tanks at least monthly once or more often, if required. This is to remove algae (plant growth which produces bad tastes and odors), silt, and bacteria which may be harmful. Cleaning methods which are followed at Navsahyadri Group of Institute:

1. Empty the tank.
2. Scrub or pressure wash the interior walls to remove dirt and grime.
3. Rinse out the tank.
4. Mix a solution of household bleach and water (1 tablespoon or 15 ml of bleach for every gallon of water).
5. Scrub or pressure wash the interior walls of the tank with this solution, and leave it sit for 2 hours.
6. After 2 hours, thoroughly rinse the tank with clean water.
7. Refill with potable water.

Water filters are replaced periodically to provide the students and staff with pure drinking water

Water Conservation and Management

The institution is located in the Hilly area. The Institute knows the value of every drop of water and

saves the rain water strategically for future use. Hence the college has installed rainwater harvesting mechanism. The rainwater is accumulated and deposited for reuse. The water collected is directed to a deep pit of bore-well for later use. Even the ground water is directed towards the plants. In spite of having maximum number of students, the institution does not face any water crisis even in the summer time. Although rainwater harvesting is gaining popularity as a sustainable water saving system in urban as well as rural areas, estimating required storage area for water remains an important design challenge and so our college has designed an effective plan with multiple pits which we collect rain water for storage.

The college has one well and one bore well recharge systems to renew bore wells with rain water.

Paperless Operating Procedure

Navsahyadri Group of Institute is striving towards a paperless office, a work environment in which

the use of paper is eliminated or greatly reduced. This is done by converting documents and other papers into digital form, a process known as digitization. Institute believes that "going paperless" can save money, boost productivity, save space, make documentation and information sharing easier, keep personal information more secure, and help the environment.

Several initiatives are taken to minimize the usage of paper. Wherever possible automation and digitization are introduced which helped in minimization of usage of paper. Digital storage of documents is one such measure. Institutional data to a great extent is stored digitally. Technology is used to a greater extent for communication among the staff and the students rather than paper communication. What's app - class wise groups, Department wise groups, Committee wise groups facilitate E-communication and use of public address systems reduces usage of paper in notices and circulars.

In addition to going paperless in the classroom, the college has also introduced "Learning Management System" wherein references , notes , syllabus question banks, study material is stored and shared on the e-platform , avoiding massive usage of paper. The teachers have also experimented with alternatives of paper -based testing with e- assignments and other skill -based tests like presentations, group discussions etc.,

Landscaping with Trees and Plants

NGI organizes Tree Plantation program every year at the College Campus. Faculty and students take part in the "**Harita Haram Programme"**, a green initiative of the government. Students and staff enthusiastically initiate and participate in the tree plantations drive on the campus and also outside the campus. Environmental promotional activities conducted in collaboration with GHMC and other eminent collaborators bring awareness among the students regarding advantages of tree plantation for an Eco-friendly Environment. College celebrates **"The World Environmental day**" on June 5th every year and **"International Plantation Day"** by conducting competitions among students and also talks by eminent people to bring awareness. The plantation program includes plantation of various types of ornamental and medicinal variety, wild plant species in large numbers. This program promotes eco-friendly environment, by stepping up the oxygen levels on the campus.

Dr. M. V. Dalvi
Principal
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Navsahyadri Group of Institutes NESGI PUNE

Energy Use and Conservation

A.) **Use of LED Bulbs in College :** Principal's Office, Office of IQAC, Administrative Office, Library, Guest Rooms, Indoor Stadium, Ladies Common Room, Virtual Classrooms, Language Lab, Computer Labs, Science Lab, Departmental Offices, and all classrooms have LED bulbs to save and conserve energy.

B) **Conducting Energy Audit:** Energy audit of consumption of electricity in the college is conducted every academic year .The objective of this audit is to identify the extent of energy consumption and find appropriate strategies of conservation.

Noise Pollution Management

A) **Silence zones in the college:** Various display boards have been placed in the library and other places for awareness to maintain silence in the college.

B) **Noise control in the college:** The security guard and the Physical Director of the college ensure smooth entry and exit of students without any noise.

C) **No pressure horns for vehicle:** Our staff members and students are asked to refrain from pressure horns

Air Pollution Management

A) **Periodic Awareness Programme for Staff, Students and Society:** The College conducts awareness programmes for staff, students and society for protecting and maintaining environment. Environment awareness programmes, rallies, etc. are conducted on various issues related to environment and health.

B) **Establishment of Oxygen Park, plantation of oxygen rich plants:** The College has a beautiful green campus. A range of medicinal plants and old trees like Neem Trees and Tulsi make the campus Oxygen Park.

C) **"No Smoking, No Tobacco" in campus area:** Tobacco and tobacco products are strictly prohibited in the college premises and consuming Tobacco and tobacco products is a punishable offence. The instructions regarding this are given to the students and the staff members. The boards are displayed at various places in the college.

D) **Free pollution check-up of 2W/4W:** To create awareness about environmental ethics the students through periodic notices are asked to go for PUC certification of their vehicles.

The college provides a free service of pollution check up every year for the students and staff vehicles in the college campus for a pollution-free environment.

Restricted Use of Automobiles

Patterns of parking and driving around campus have significant effects on campus life and the environment at large. While it seems like a relatively small issue in the context of the operations of the College, reducing driving behavior fits within many of the other initiatives that the College has set forth to achieve, such as the Sustainability Initiative and creating well-rounded citizens of the community at-large. Currently, the College is beginning to monitor its carbon footprint and focus on a more environmentally sustainable campus, which is in conflict with the increasing number of cars and parking lots on campus. So Navsahyadri Group of Institute has adopted restricted use of automobiles entry through its clearly laid out parking policy which restricts the students to get only 2 wheelers, not allowing them to get 4 wheeler. Though college campus has the capacity to accommodate 500 vehicles but this policy restricts them to only 300. In sync with the Green Policy, only 30 percent of the staff use parking space for their private vehicles, while the rest of them depend on public transportation.

Ban on Single-use Plastics on the Campus

IT has been constantly adopting practices and revising its policies towards a cleaner and plastic-free campus.

Following the MHRD and UGC guidelines on 2 October 2019 to educational institutions across the country, St. Navsahyadri Group of Institute has issued a notification to Students and all Stakeholders that there would be a ban implemented on the use of single use plastics on the campus with effect from 15 October 2019.

The institution through its NAVSAHYADRI GROUP OF INSTITUTE conducts sensitization programs on the harmful impact of single-use plastics and mandates all the students to avoid bringing non-bio-degradable plastic items to the institution, which include plastic bags, cups, plates, small drinking water bottles, straws and sachets. The institution facilitates environment friendly substitutes like stainless steel, washable and reusable tumblers at all water units and mandates the canteen to serve only in paper plates and paper cups to systematically ban the use of plastics on the campus.

The Navsahyadri Group of Institute Green Group also encourages the students to sensitize their respective households about the harmful effects of plastics and make their households plastic-free.

Display Boards on College Campus

Various boards that promote environmental awareness and ethics -- noise control, tobacco free campus, conservation of energy, recycling of resources, tree plantation etc are displayed for all the stakeholders.

Green Audit

Navsahyadri Group of Institute College committed to create "an environment of educational excellence" adopts the 'Green Campus' system for environmental conservation and sustainability. The College conducts Green Audit every year to identify, quantify, describe and priorities a framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. A gardener and full time staff are appointed for the maintenance of clean and Green Campus

These strategies are incorporated into the institutional planning and budgeting processes with the aim of developing a clean and green campus. The institution is committed to make necessary efforts to involve the students, faculty and staff in "Green Campus Initiatives" by designating volunteers, printing T-shirts/ Caps with green campus initiative slogan specially designed for the purpose.

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Navsahyadri Group of Institutes NESGI PUNE

ENERGY AUDIT REPORT

of

NAVSAHYADRI GROUP OF INSTITUTE

Naigaon, Taluka: Bhor, Dist: Pune 412 213

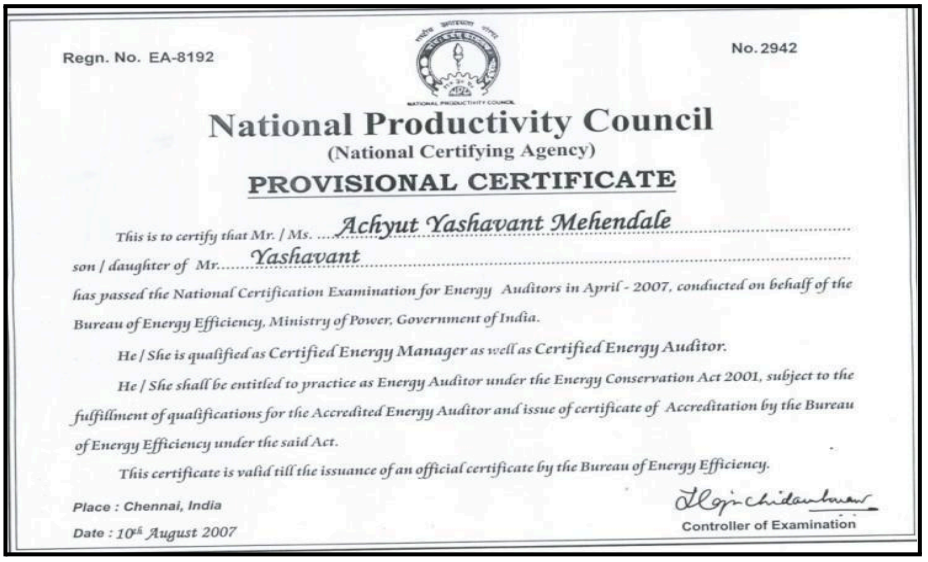
Year: 2023-24

Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795, Email: engress123@gmail.com

REGISTRATION CERTIFICATES



Regn. No. EA-8192 No. 2942

National Productivity Council
(National Certifying Agency)
PROVISIONAL CERTIFICATE

This is to certify that Mr. / Ms. Achyut Yashavant Mehendale
son / daughter of Mr. Yashavant
has passed the National Certification Examination for Energy Auditors in April - 2007, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

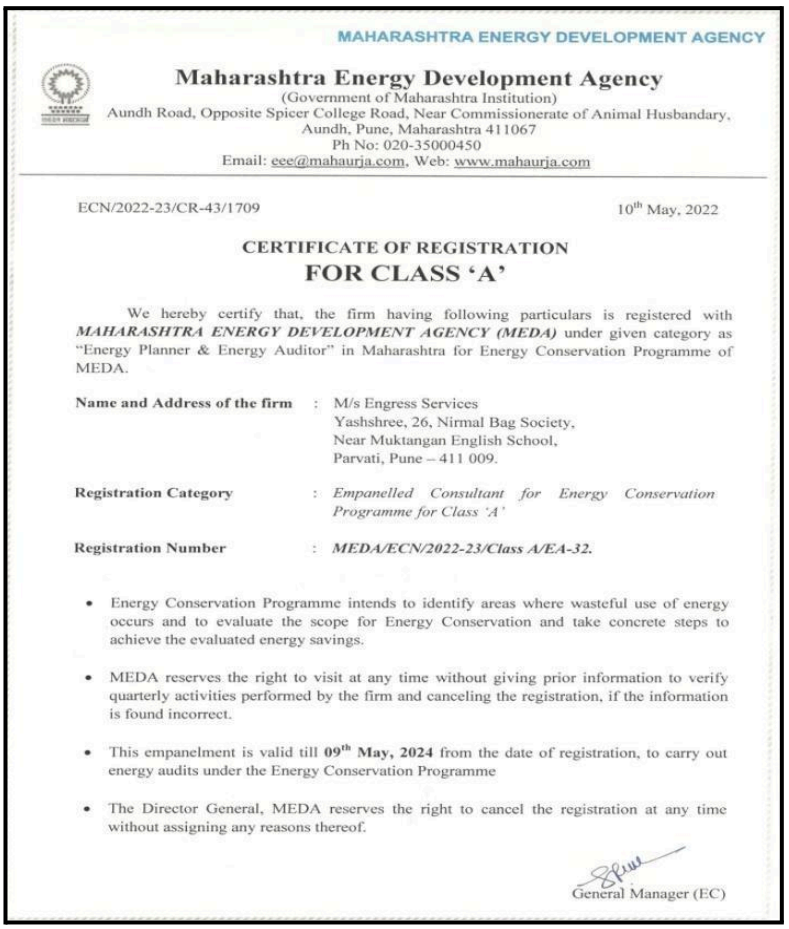
He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India
Date : 10th August 2007

Controller of Examination

BEE Auditor Certificate



MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary, Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eee@mahaurja.com, Web: www.mahaurja.com

ECN/2022-23/CR-43/1709 10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with *MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)* under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : M/s Engress Services
Yashshree, 26, Nirmal Bag Society,
Near Muktangan English School,
Parvati, Pune – 411 009.

Registration Category : *Empanelled Consultant for Energy Conservation Programme for Class 'A'*

Registration Number : *MEDA/ECN/2022-23/Class A/EA-32.*

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **09th May, 2024** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

MEDA Empanelment Certificate

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: engress123@gmail.com

Ref: ES/NIP/21-22/01 Date: 18/5/2024

ENERGY AUDIT CERTIFICATE

Certificate No:ES/NESGOI/23-24/01

This is to certify that we have conducted Energy Audit at Navsahyadri Group Of Institute, Naigaon, Taluka: Bhor, District: Pune in the Year 2023-24.

The Institute has adopted Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment.
- Usage of BEE STAR Rated Equipment
- Installation of 15 kWp Roof Top Solar PV Plant
- Installation of Solar Thermal Water Heating System at Hostel Blocks.

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

For Engress Services,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune 411 009 Tel: 09890444795 Email: engress123@gmail.com
UDYAM Regn. No: UDYAM-MH-26-0135636,
MEDA Regn. No: ECN/2023-24/CR-43/1709
ISO: 9001-2015 Certified (Cert No: 23EQKC13),
ISO: 14001-2015 Certified (Cert No: 23EEKW20)

ENERGY AUDIT CERTIFICATE

Certificate No: ES/NESGOI/23-24/01 Date: 18/5/2024

This is to certify that we have conducted Energy Audit at Navsahyadri Education Society's Group of Institutions, Naigaon, Pune in the Academic year 2023-24.

The Institute has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Installation of 15 kWp Roof Top Solar PV Plant
- Installation of Solar Thermal Water Heating System, at Hostel Blocks

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient.

For Engress Services,

A Y Mehendale,
B E-Mechanical, M Tech- Energy
BEE Certified Energy Auditor, EA-8192

ENGRESS SERVICES PUNE

IAF

EGAC Accredited

INDEX

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Navsahyadri Group Of Institute, Naigaon, Taluka: Bhor, District: Pune for awarding us the assignment of Energy Audit of their Campus, for the Academic Year: 2023-24.

We are thankful to all staff members for helping us during the field study.

Dr. M. V. Dalvi
Principal
NESGI, Faculty of Engineering
Gat No.69,70,71,Naigaon, Tal. Bhor, Dist. Pune

Navsahyadri Group of Institutes NESGI PUNE

EXECUTIVE SUMMARY

1. Navsahyadri Group Of Institute, Naigaon, Taluka: Bhor, District: Pune consumes Energy in the form of **Electrical Energy and LPG** used for various gadgets, office & other facilities.

2. Present Energy Consumption:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Total	36813	112	33.43
2	Maximum	3236	18	2.93
3	Minimum	2875	6	2.64
4	Average	3067.75	9.33	2.79

3. Energy Conservation projects already installed:

- Usage of Energy Efficient LED fittings
- Usage of BEE STAR Rated Equipment
- Installation of **5 kWp** Roof Top Solar PV Plant

4. Usage of Alternate Energy:

- The Institute has installed Roof Top Solar PV Plant of Capacity **5 kWp.**
- Annual Energy generated by Solar PV Plant is **6000 kWh**
- Energy Purchased in 21-22 is **36813 kWh**
- Total Annual Energy Demand of the Institute is **42813 kWh**
- Percentage of Usage of Alternated Energy to Total Energy Demand is **14 %.**

5. Usage of LED Lighting:

- The Total LED Lighting load of Institute is **2.4 kW.**
- The Total Lighting Load of the Institute is **5.48 kW.**
- The % of LED Lighting to Total Lighting Load is **43.80 %.**

6. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2 into atmosphere
2. **1 Kg** of LPG releases **2.68 Kg of CO_2** into atmosphere
3. **1 kWp** of Solar PV Plant generates **4 kWh** of Energy per Day
4. Annual Solar Energy generation Days: **300 Nos**

7. References:

- For CO_2 Emissions: www.tatapower.com
- Solar PV Energy generation: www.solarrooftop.gov.in

ABBREVIATIONS

BEE	Bureau of Energy Efficiency
MSEDCL	Maharashtra Electricity Distribution Company Limited
kWh	Kilo Watt Hour
kWp	Kilo Watt Peak
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
LPG	Liquefied Petroleum Gas
FTL	Fluorescent Tube Light
LED	Light Emitting Diode

CHAPTER-I
INTRODUCTION

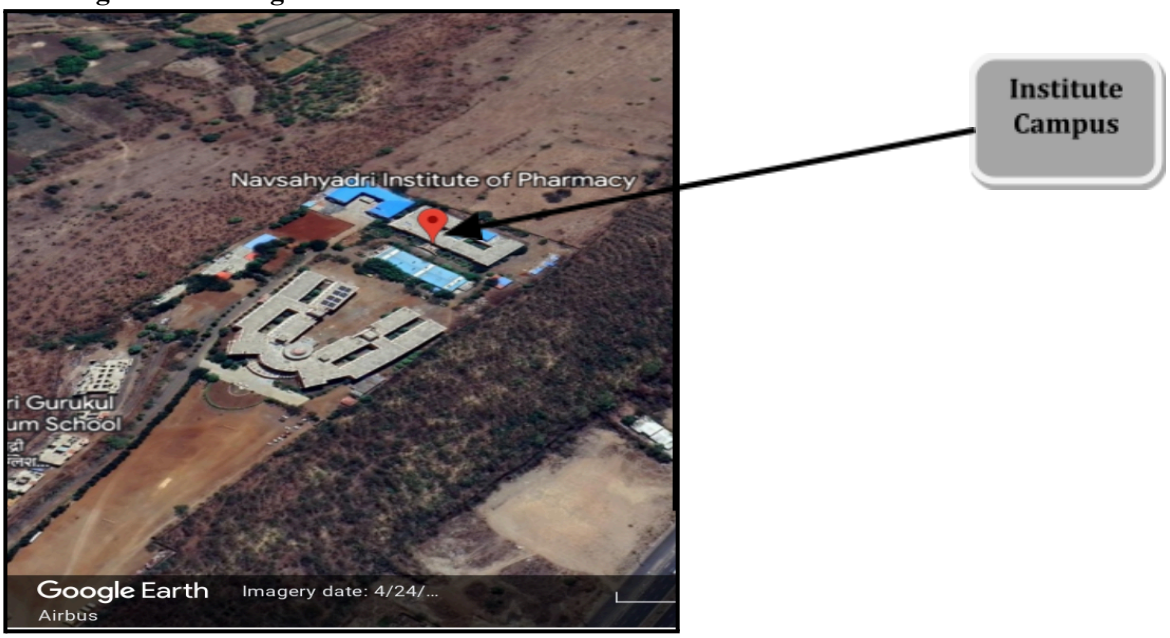
1.1 Objectives:

1. To study Connected Load
2. To study Present Energy Consumption
3. To compute the CO_2 Emissions
4. To study usage of Alternate Energy
5. To study usage of LED Lighting

1.2 Table No 1: General Details of the Institute:

No	Head	Particulars
1	Name of Institute	Navsahyadri Group Of Institute
2	Address	Naigaon, Taluka: Bhor, District: Pune 412 213
3	Year of Establishment	2017

1.3 Google Earth Image:



CHAPTER-II
STUDY OF CONNECTED LOAD

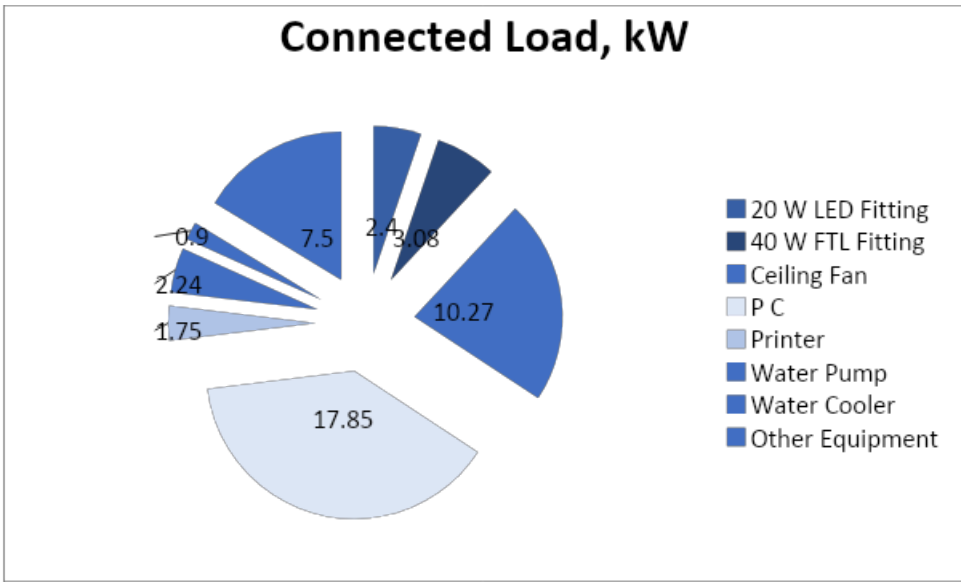
The major contributors to the connected load of the Institute are as under.

Table No 2: Equipment wise Connected Load:

No	Equipment	Qty	Load/unit	Load, kW
1	20 W LED Fitting	120	20	2.4
2	40 W FTL Fitting	77	40	3.08
3	Ceiling Fan	158	65	10.27
4	P C	119	150	17.85
5	Printer	10	175	1.75
6	Water Pump	1	2238	2.24
7	Water Cooler	2	450	0.9
8	Other Equipment	30	250	7.5
9	**Total**			**46**

We present the above Data in a PIE Chart as under.

Chart No1: Connected Load:



CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Energy Consumption

Table No 3: Study of Electrical Energy & LPG Consumption: 21-22:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg
1	Apr-21	2998	6
2	May-21	3009	8
3	Jun-21	3114	10
4	Jul-21	3218	12
5	Aug-21	3069	8
6	Sep-21	3189	6
7	Oct-21	2978	12
8	Nov-21	2875	18
9	Dec-21	2998	10
10	Jan-22	3004	8
11	Feb-22	3125	6
12	Mar-22	3236	8
13	Total	36813	112
14	Maximum	3236	18
15	Minimum	2875	6
16	Average	3067.75	9.33

Chart No 2: To study the variation of Monthly Electrical Energy Consumption:

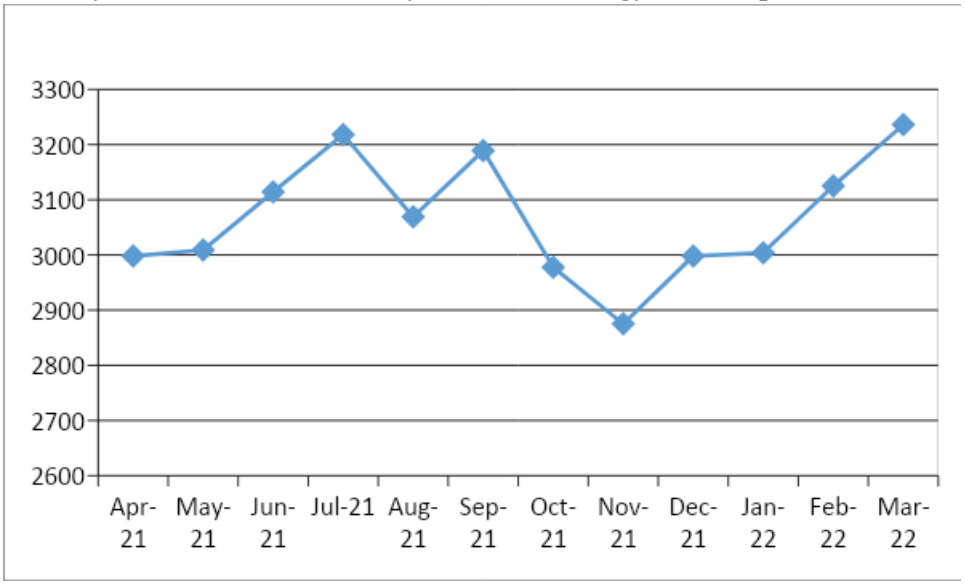
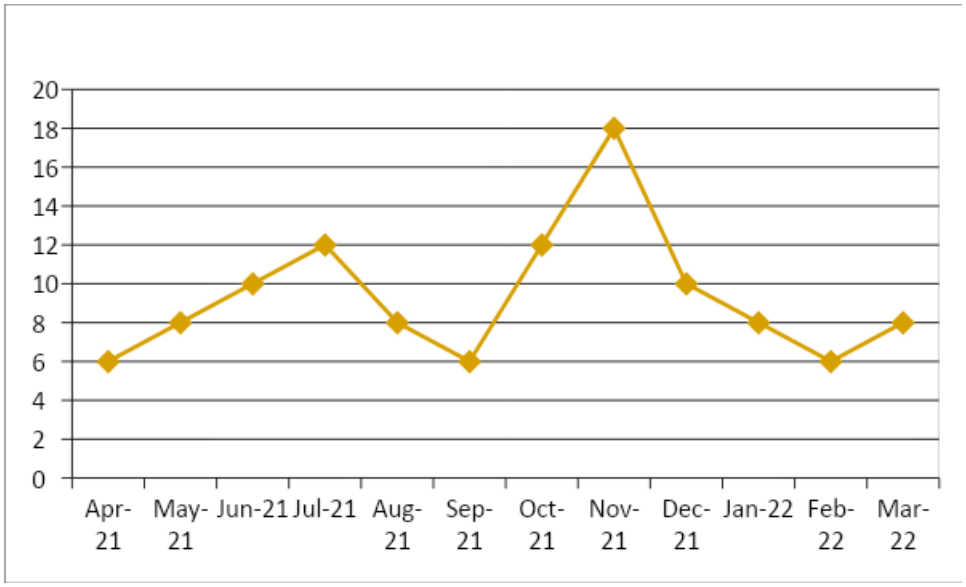


Chart No 3: Study of Month wise LPG Consumption:



CHAPTER-IV
STUDY OF CO_2 EMISSION

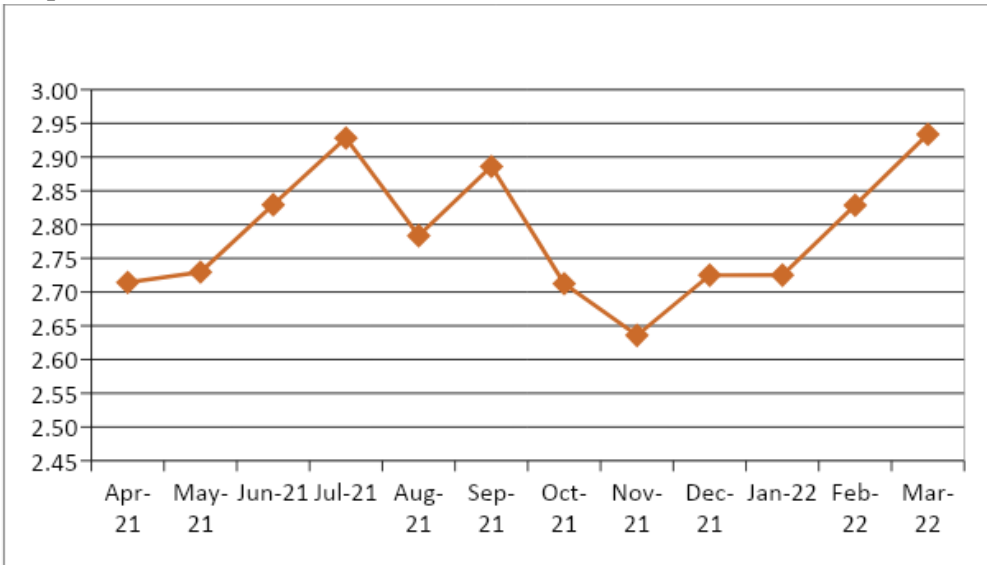
A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.
Basis for computation of CO_2 Emissions:

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere
- **1 Kg of LPG** releases **2.68 Kg** of CO_2 into atmosphere.

Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Apr-21	2998	6	2.71
2	May-21	3009	8	2.73
3	Jun-21	3114	10	2.83
4	Jul-21	3218	12	2.93
5	Aug-21	3069	8	2.78
6	Sep-21	3189	6	2.89
7	Oct-21	2978	12	2.71
8	Nov-21	2875	18	2.64
9	Dec-21	2998	10	2.73
10	Jan-22	3004	8	2.73
11	Feb-22	3125	6	2.83
12	Mar-22	3236	8	2.93
13	Total	36813	112	33.43
14	Maximum	3236	18	2.93
15	Minimum	2875	6	2.64
16	Average	3067.75	9.33	2.79

Chart No 4: Representation of Month wise CO_2 Emissions:



CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

The Institute has installed Roof Top Solar PV Plant of Capacity **5 kWp.**

In the following Table, we present the percent usage of Renewable Energy to Total Annual Energy Demand of the Institute.

Table No 5: Computation of % of Alternate Energy to Total Annual Energy Demand:

No	Particulars	Value	Unit
1	Energy Purchased from MSEDCL	**36813**	kWh
2	Installed Roof Top Solar PV Plant Capacity	5	kWp
3	Average Daily Energy Generated	4	kWh/kWp
4	Annual Generation Days	300	Nos
5	Annual Solar Energy Generated	**6000**	kWh
6	Total Energy Demand = (1) + (5)	**42813**	kWh
7	% of Usage of Alternate Energy to Total Energy Demand= (5)*100/ (6)	**14**	%

Photograph of Roof Top Solar PV Plant:

CHAPTER VI
STUDY OF USAGE OF LED LIGHTING

In this chapter, we compute the percentage of usage of LED Lighting to Total Lighting Load..

Table No 6: Percentage of Usage of LED Lighting to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	77	Nos
2	Load/unit of 40 W FTL Fitting	40	W
3	Total Load for 40 W FTL Fittings	**3.08**	kW
4	No of 20 W LED Fittings	120	Nos
5	Load/unit of 20 W LED Fitting	20	W
6	Total Load for 20 W LED Fittings	**2.4**	kW
7	Total LED Lighting Load = 6	**2.4**	kW
8	Total LED Lighting Load = 3+6	**5.48**	kW
9	% of LED to Total Lighting Load= **7*100/8**	**43.80**	%

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Navsahyadri Group of Institutes NESGI PUNE