ENERGY AUDIT REPORT

of

NAVSAHYADRI GROUP OF INSTITUTE

Naigaon, Taluka: Bhor, Dist: Pune 412 213

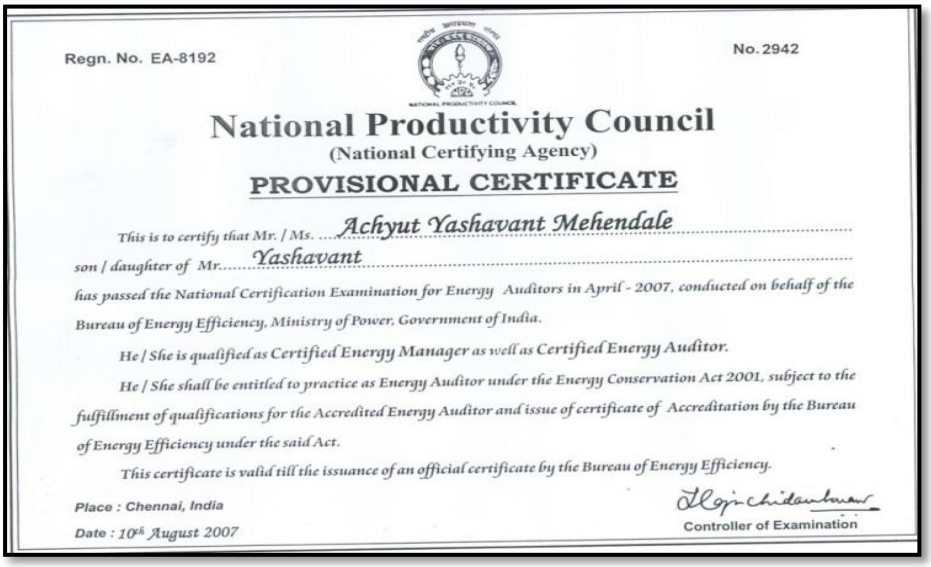
Year: 2023-24

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: 16/5/2024

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
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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

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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: 2021-22.

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

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

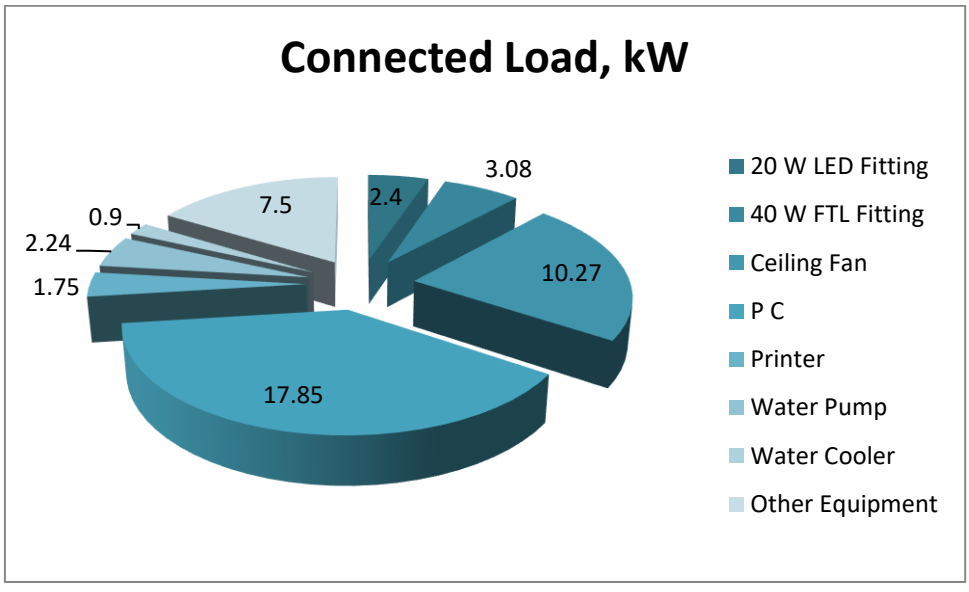
The major contributors to the connected load of the Institute are as under.

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:

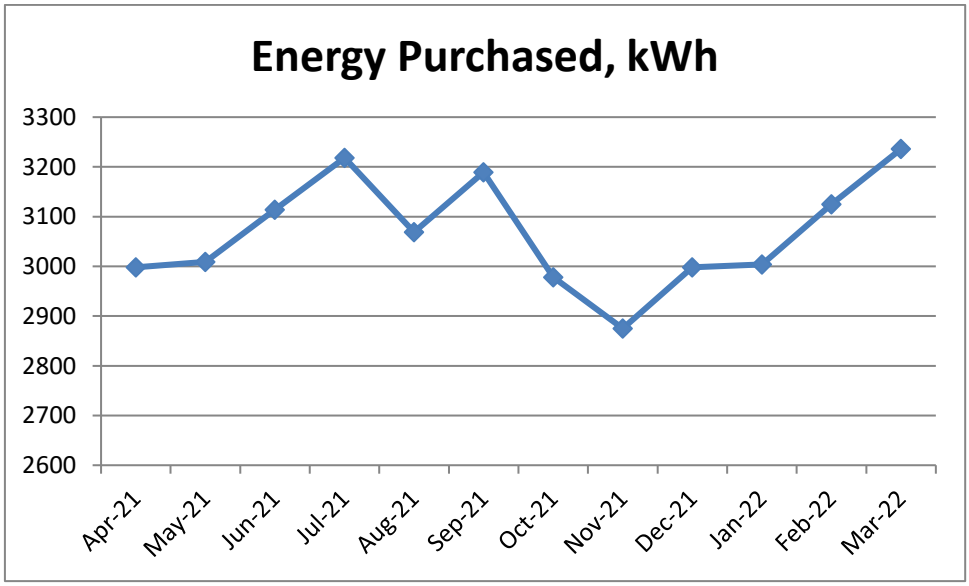
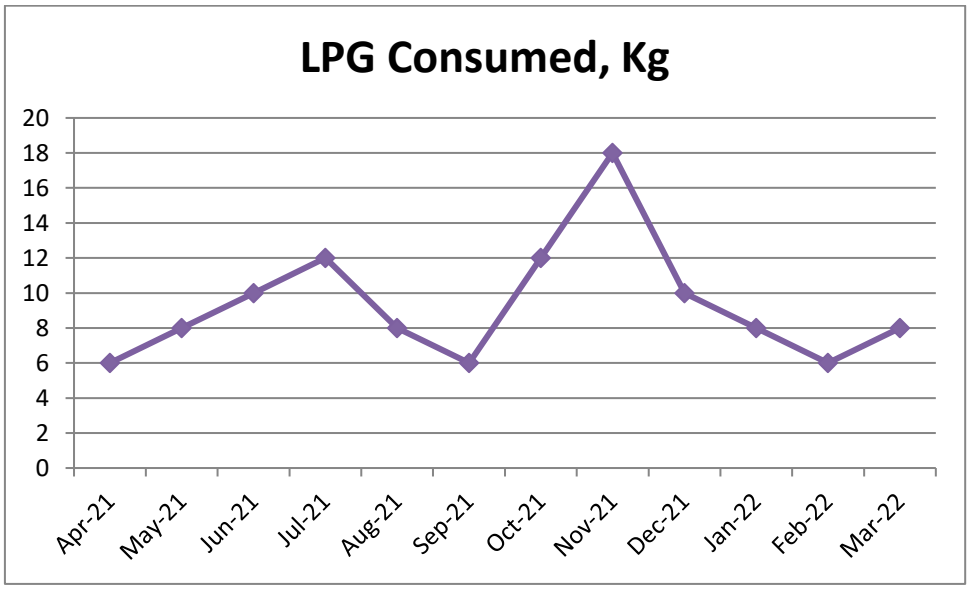


Chart No 3: Study of Month wise LPG Consumption:



CHAPTER-IV
STUDY OF CO_2 EMISSION

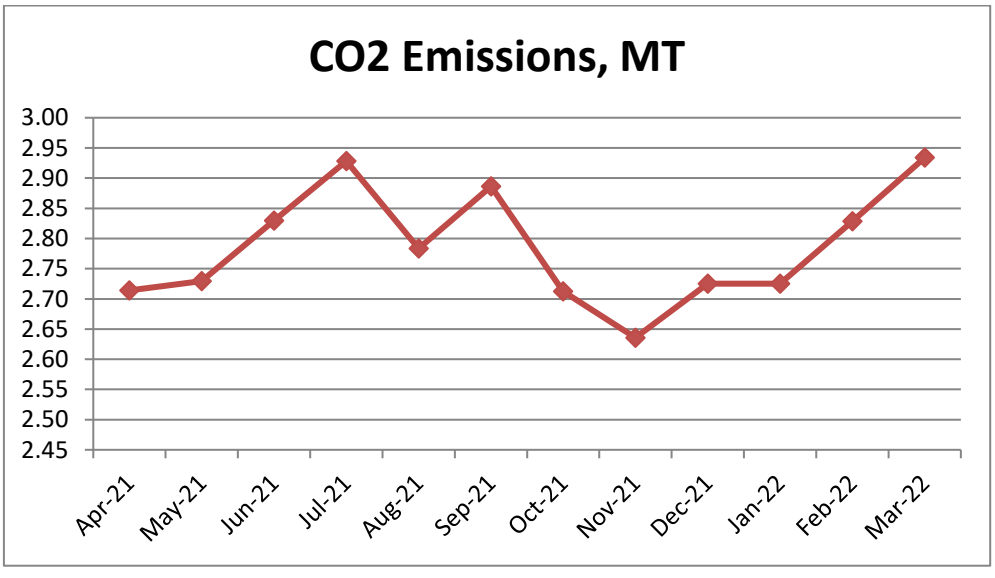
A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO_2 Emissions:**

- **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**	%