

ENERGY AUDIT REPORT

Priyadarshini College of Engineering,

Priyadarshini Campus, C.R.P.F., Nagpur - 440019 (MH)



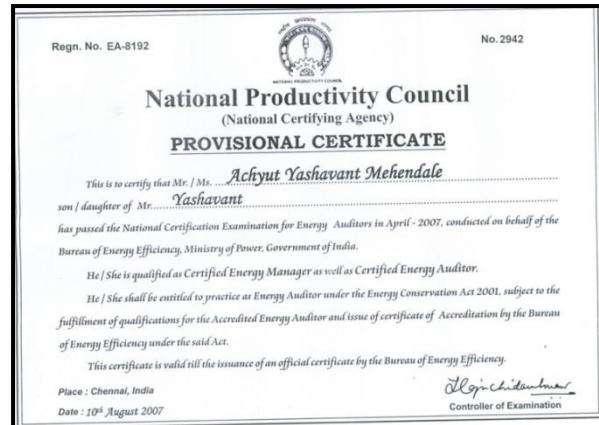
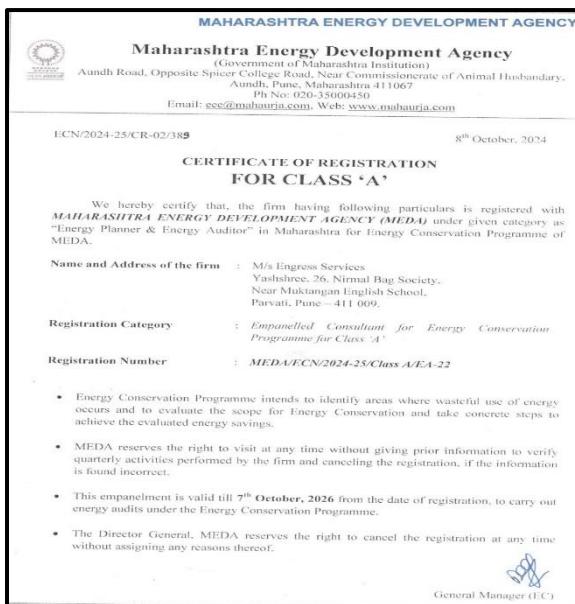
Year: 2024-25

Prepared by:

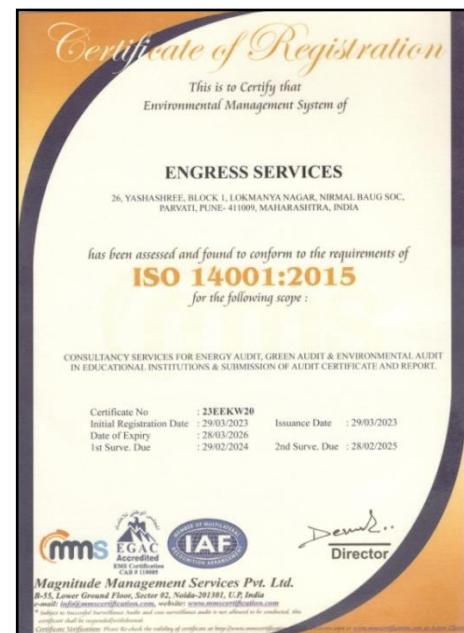
ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society
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REGISTRATION CERTIFICATES: BEE, UDYAM, MEDA, ISO-9001 & 14001:



UDYAM REGISTRATION NUMBER		UDYAM-MH-26-0135636																					
NAME OF ENTERPRISE		ENGRESS SERVICES																					
TYPE OF ENTERPRISE *		<table border="1"> <thead> <tr> <th>S.No.</th> <th>Classification Year</th> <th>Enterprise Type</th> <th>Classification Date</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2023-24</td> <td>Micro</td> <td>03/02/2024</td> </tr> <tr> <td>2</td> <td>2022-23</td> <td>Micro</td> <td>26/06/2022</td> </tr> <tr> <td>3</td> <td>2021-22</td> <td>Micro</td> <td>27/07/2021</td> </tr> </tbody> </table>		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				
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ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Priyadarshini College of Engineering, Nagpur, for awarding us the assignment of Energy Audit of their campus for the Academic Year: 2024-25.

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

EXECUTIVE SUMMARY

1. **Priyadarshini College of Engineering, Nagpur**, consumes Energy in the form of **Electrical Energy and** used for various gadgets, office & other facilities

2. Study of Connected Load & Present Energy Consumption:

No	Particulars	Value	Unit
1	Total Connected Load	367	kW
2	Annual Energy Purchased	111355	kWh

3. Per Capita Energy Consumption:

No	Particulars	Value	Unit
1	Annual Energy Consumed	111355	kWh
2	No of students studying in the Institute	5556	Nos
3	Per Capita Energy Consumption =(1) / (2)	20.04	kWh/Annum

4. Study of % Usage of LED Lighting:

No	Particulars	Value	Unit
1	% of Usage of LED Lighting to Total Lighting Load	84.51	%

5. Renewable Energy & Energy Efficiency Projects:

- Usage of Energy Efficient LED fittings
- Usage of BEE STAR Rated Equipment
- Installation of 400 kWp Solar Power Plant on College Building

6. Assumptions:

1. Emission Factor of Electricity: **0.93 Kg of CO₂/kWh**
2. Average Solar PV Energy Generation: **4 kWh/Day**
3. Annual Solar Energy Generation Days: **300 Nos**
4. CO₂ Emissions are computed For **Scope-2**
5. CO₂ Emissions are computed based on Electrical Energy purchased

7. References:

- Audit Methodology: www.mahaurja.com
- Energy Conservation Building Code: ECBC-2017: www.beeindia.gov.in
- For CO₂ Emission Factors: www.ccd.gujarat.gov.in
- For Solar PV Energy Generation: www.rooftopsolar.gov.in

ABBREVIATIONS

LED	: Light Emitting Diode
MSEDCL	: Maharashtra State Electricity Distribution Company Limited
IQAC	: Internal Quality Assurance Cell
BEE	: Bureau of Energy Efficiency
FTL	: Fluorescent Tube Light
CFL	: Compact Fluorescent Light
PV	: Photo Voltaic
Kg	: Kilo Gram
kWh	: kilo-Watt Hour
CO ₂	: Carbon Di Oxide
MT	: Metric Ton

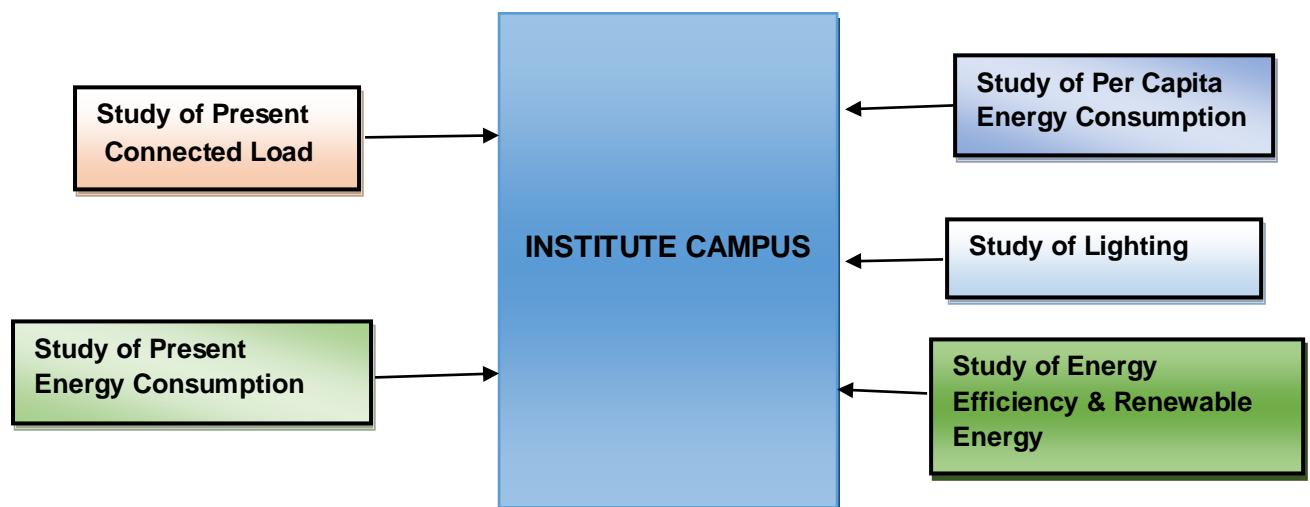
CHAPTER-I

INTRODUCTION

1.1 Introduction:

An Energy Audit is conducted at **Priyadarshini College of Engineering, Nagpur**.

1.2 Key Study Points:



1.3 Institute Location Image:



CHAPTER-II

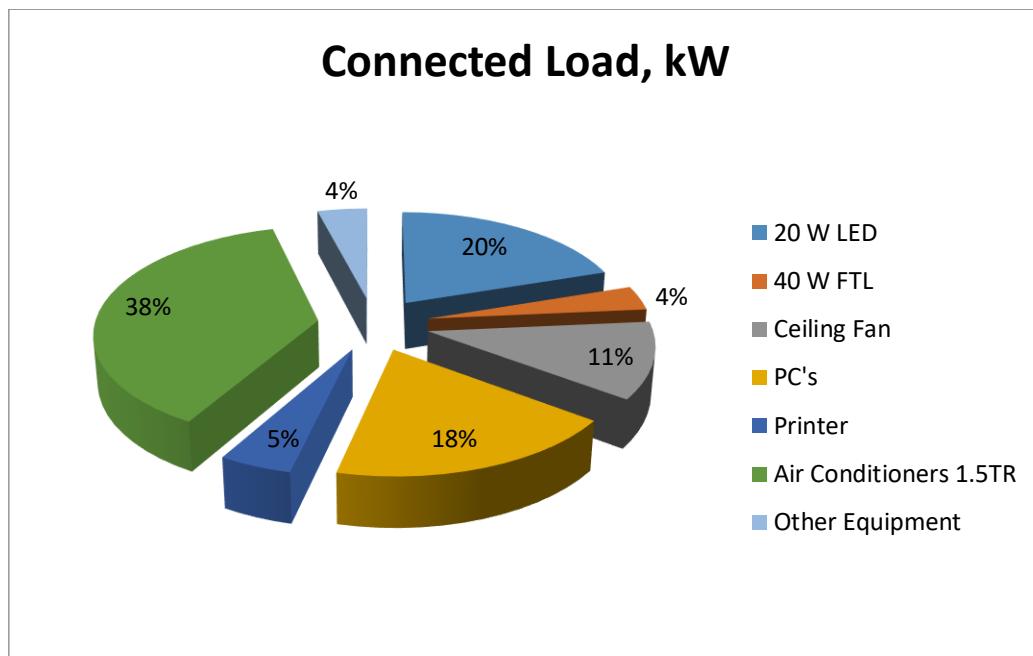
STUDY OF CONNECTED LOAD

In this Chapter we present the major contributors to the connected load.

Table No 1: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	20 W LED	3655	20	73.1
2	40 W FTL	335	40	13.4
3	Ceiling Fan	650	65	42.25
4	PC's	455	150	68.25
5	Printer	113	150	16.95
6	Air Conditioners 1.5TR	125	1104	138
8	Other Equipment	150	100	15
9	Total			367

Chart No 1: Study of Connected Load:



CHAPTER-III

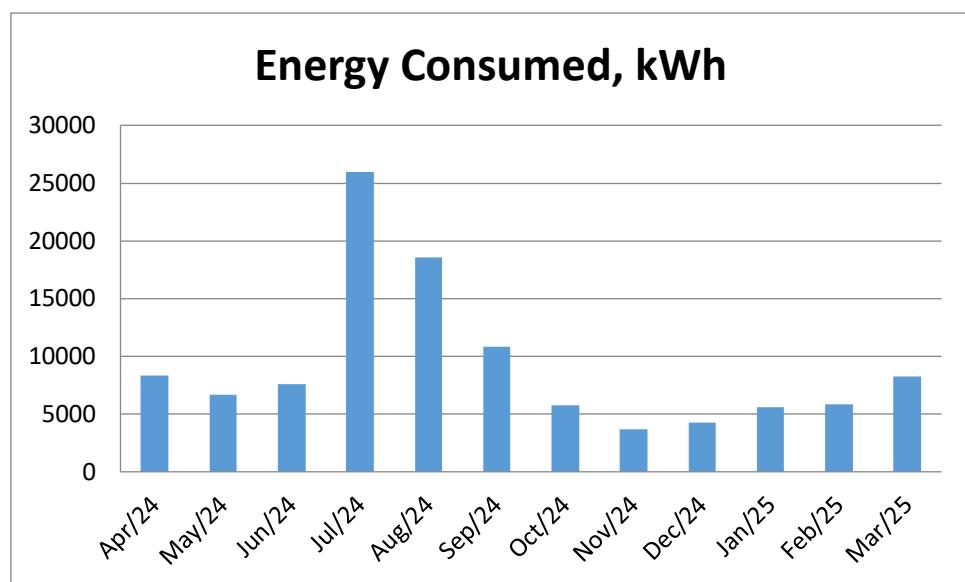
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Energy Consumption of the Institute.

Table No 2: Study of Energy Consumption: 2024-25:

No	Month	Energy Purchased, kWh	CO ₂ Emissions, MT
1	Apr-24	8295	7.47
2	May-24	6652	5.99
3	Jun-24	7600	6.84
4	Jul-24	25990	23.39
5	Aug-24	18535	16.68
6	Sep-24	10815	9.73
7	Oct-24	5794	5.21
8	Nov-24	3697	3.33
9	Dec-24	4287	3.86
10	Jan-25	5620	5.06
11	Feb-25	5820	5.24
12	Mar-25	8250	7.42
13	Total	111355	100.22
14	Maximum	25990	23.39
15	Minimum	3697	3.33
16	Average	9280	8.35

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



CHAPTER-IV

STUDY OF PER CAPITA ENERGY CONSUMPTION

Per Capita Energy Consumption Index: Per Capita Energy Consumption Index of an educational Institute/Institute is its Annual Energy Consumption in Kilo Watt Hours per student studying in the Institute/Institute.

It is determined by:

$$\text{Per Capita Energy Consumption Index} = \frac{\text{Annual Energy Consumption in kWh}}{\text{(Total No of students studying)}}$$

Table No 3: Computation of Per Capita Energy Consumption Index:

No	Particulars	Value	Unit
1	Total Annual Energy Purchased	111355	kWh
2	No of students studying in the Institute	1870	Nos
3	Per Capita Energy Consumption = (3) / (4)	24.80	kWh/Annum

CHAPTER-V

STUDY OF LIGHTING

Terminology:

- 1. Lumen** is a unit of light flow or luminous flux. The lumen rating of a lamp is a measure of the total light output of the lamp. The most common measurement of light output (or luminous flux) is the lumen. Light sources are labeled with an output rating in lumens.
- 2. Lux** is the metric unit of measure for illuminance of a surface. One lux is equal to one lumen per square meter.
- 3. Circuit Watts** is the total power drawn by lamps and ballasts in a lighting circuit under assessment.
- 4. Installed Load Efficacy** is the average-maintained illuminance provided on a horizontal working plane per circuit watt with general lighting of an interior. Unit: lux per watt per square metre (lux/W/m²)
- 5. Lamp Circuit Efficacy** is the amount of light (lumens) emitted by a lamp for each watt of power consumed by the lamp circuit, i.e. including control gear losses. This is a more meaningful measure for those lamps that require control gear. Unit: lumens per circuit watt (lm/W)
- 6. Lighting Power Density:** It is defined as Total Lighting Load in a room divided by the Area of that Room in square meters.

In this Chapter we compute the Lighting Power density and the percentage usage of LED Lighting to total Lighting Load of the Institute.

Table No 4: Computation of % Usage of LEDs to Total Lighting Load:

No	Particulars	Value	Unit
1	Total LED Lighting Load	73.10	kW
2	Total Lighting Load	86.50	kW
3	% of LED to Total Lighting Load=1*100/2	84.51	%

CHAPTER-VI

STUDY OF RENEWABLE ENERGY & ENERGY EFFICIENCY

Usage of Renewable Energy & Energy Conservation Projects:

No	Head	Observation	Photograph
1	Usage of Renewable Energy	Installation of 400 kWp Roof Top Solar PV Plant	<p>Solar Power Plant</p> 
2	Energy Conservation Projects	Usage of LED Tubes	<p>LED Tube</p> 

ENGRESS SERVICES

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UDYAM, MEDA Registered, ISO-9001 & ISO-14001 Certified



ENERGY AUDIT CERTIFICATE

Certificate No: ES/PCE/24-25/01

Date: 8/5/2025

This is to certify that we have conducted Energy Audit **Priyadarshini College of Engineering, Nagpur**, in the Academic Year 2024-25.

The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Installation of Solar Power Plant on College Building

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

