

# ENERGY AUDIT REPORT

Shri Wagheshwar Gramvikas Pratishthan's,  
**LOKNETE SHRI DADA PATIL PHARATE**  
**COLLEGE OF PHARMACY,**  
Mandavgan Pharata, Taluka: Shirur, District: Pune



Year: 2023-24

Prepared by:

**ENGRESS SERVICES**

Yashashree, 26, Nirmal Bag Society  
Near Mukhtangan English School, Parvati, Pune 411009  
Phone: 09890444795 Email: [engress123@gmail.com](mailto:engress123@gmail.com)

## REGISTRATION CERTIFICATES: BEE, UDYAM, MEDA, ISO-9001 &amp; 14001:

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: 020-25000450  
Email: ee@maharaja.com, Web: www.maharaja.com

ECN/2022-23/CR-43/1709 10<sup>th</sup> 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  
Yashashree, 26, Nirmal Bang 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-J2.

- 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 09<sup>th</sup> 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)

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  
fulfilment 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 : 10<sup>th</sup> August 2007

Controller of Examination

भारत सरकार  
Government of India  
सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय  
Ministry of Micro, Small and Medium Enterprises

**UDYAM REGISTRATION CERTIFICATE**

UDYAM REGISTRATION NUMBER UDYAM-MH-26-0135636

NAME OF ENTERPRISE ENGRESS SERVICES

TYPE OF ENTERPRISE \*

| 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          |

MAJOR ACTIVITY SERVICES

SOCIAL CATEGORY OF ENTREPRENEUR GENERAL

NAME OF UNIT(S)

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

OFFICIAL ADDRESS OF ENTERPRISE

| Flat/Door/Block No. | 26                                   | Name of Premises/ Building | Yashashree           |
|---------------------|--------------------------------------|----------------------------|----------------------|
| Village/Town        | Pune                                 | Block                      | 1                    |
| Road/Street/Lane    | Lokmanya<br>Nagar/Nirmal Bang<br>Soc | City                       | Pune                 |
| State               | MAHARASHTRA                          | District                   | PUNE, Pin 411009     |
| Mobile              | 8767447244                           | Email:                     | engress123@gmail.com |

DATE OF INCORPORATION /  
REGISTRATION OF ENTERPRISE 13/04/2021

DATE OF COMMENCEMENT OF  
PRODUCTION/BUSINESS 13/04/2021

NATIONAL INDUSTRY  
CLASSIFICATION CODE(S)

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

DATE OF UDYAM REGISTRATION 27/07/2021

**Certificate of Registration**

This is to Certify that  
Environmental Management System of

**ENGRESS SERVICES**  
26, YASHASHREE, BLOCK 1, LOKMANYA NAGAR, NIRMAL BAUG SOC,  
PARVATI, PUNE-411009, MAHARASHTRA, INDIA

has been assessed and found to conform to the requirements of  
**ISO 14001:2015**  
for the following scope :

CONSULTANCY SERVICES FOR ENERGY AUDIT, GREEN AUDIT & ENVIRONMENTAL AUDIT  
IN EDUCATIONAL INSTITUTIONS & SUBMISSION OF AUDIT CERTIFICATE AND REPORT.

Certificate No : 23EEKW20  
Initial Registration Date : 29/03/2023 Issuance Date : 29/03/2023  
Date of Expiry : 28/03/2026  
1st Surve. Due : 29/02/2024 2nd Surve. Due : 28/02/2025

**Director**

**Magnitude Management Services Pvt. Ltd.**  
B-15, Lower Ground Floor, Sector 82, Noida-201301, U.P, India  
www.magnitudecertification.com, website: www.magnitudecertification.com  
\* subject to successful surveillance audit and surveillance audit is not allowed to be conducted, this  
certificate shall be suspended/withdrawn.  
Certificate Verification: Please check the validity of certificate on the following website: www.magnitudecertification.com

**Certificate of Registration**

This is to Certify that  
Quality Management System of

**ENGRESS SERVICES**  
26, YASHASHREE, BLOCK 1, LOKMANYA NAGAR, NIRMAL BAUG SOC, PARVATI,  
PUNE-411009, MAHARASHTRA, INDIA

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Certificate No : 23EQKC13  
Initial Registration Date : 27/03/2023 Issuance Date : 27/03/2023  
Date of Expiry : 26/03/2026  
1st Surve. Due : 27/02/2024 2nd Surve. Due : 27/02/2025

**Director**

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## **ACKNOWLEDGEMENT**

We Engress Services, Pune, express our sincere gratitude to the management of Shri Wagheshwar Gramvikas Pratishthan's Loknete Shri Dada Patil Pharate College Of Pharmacy, Mandavgan Pharate, Taluka: Shirur, District: Pune, for awarding us the assignment of Energy Audit of their Mandavgan campus for the Year: 2023-24.

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

## EXECUTIVE SUMMARY

1. Shri Wagheshwar Gramvikas Pratishthan's Loknete Shri Dada Patil Pharate College of Pharmacy, Mandavgan Pharate, Taluka: Shirur, District: Pune consumes Energy in the form of **Electrical Energy**; used for various gadgets, Office & other facilities.

### 2. Present Connected Load & Energy Consumption:

| No | Particulars            | Value | Unit |
|----|------------------------|-------|------|
| 1  | Total Connected Load   | 18.5  | kW   |
| 2  | Annual Energy Consumed | 21295 | kWh  |

### 3. Per Capita Energy Consumption Index:

| No | Particulars                               | Value | Unit      |
|----|-------------------------------------------|-------|-----------|
| 1  | Total Annual Energy Consumed              | 21295 | kWh       |
| 2  | Total No of Students                      | 545   | Nos       |
| 3  | Per Capita Energy Consumption = (1) / (2) | 39.07 | kWh/Annum |

### 4. Study of % Usage of LED Lighting:

| No | Particulars                                       | Value | Unit             |
|----|---------------------------------------------------|-------|------------------|
| 1  | Lighting Power Density                            | 6.4   | W/m <sup>2</sup> |
| 2  | % of Usage of LED Lighting to Total Lighting Load | 100   | %                |

### 5. Renewable Energy & Energy Efficiency Projects:

- Usage of Energy Efficient LED fittings
- The College has installed Solar Thermal Water Heating System at the Hostel Block
- The College has yet to install Roof Top Solar PV Plant.

### 6. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.93 Kg of CO<sub>2</sub>** into atmosphere
2. Energy consumption is computed based on Load Utilization Factor

### 7. References:

- Audit Methodology: [www.mahaurja.com](http://www.mahaurja.com)
- Energy Conservation Building Code: ECBC-2017: [www.beeindia.gov.in](http://www.beeindia.gov.in)
- For CO<sub>2</sub> Emissions: [www.ccd.gujarat.gov.in](http://www.ccd.gujarat.gov.in)

## **ABBREVIATIONS**

|                 |                                                              |
|-----------------|--------------------------------------------------------------|
| LED             | : Light Emitting Diode                                       |
| MSEDCL          | : Maharashtra State Electricity Distribution Company Limited |
| BEE             | : Bureau of Energy Efficiency                                |
| ECBC            | : Energy Conservation Building Code                          |
| MEDA            | : Maharashtra Energy Development Agency                      |
| PV              | : Photo Voltaic                                              |
| Kg              | : Kilo Gram                                                  |
| kWh             | : kilo-Watt Hour                                             |
| CO <sub>2</sub> | : Carbon Di Oxide                                            |
| MT              | : Metric Ton                                                 |

## CHAPTER-I INTRODUCTION

### 1.1 Introduction:

An Energy Audit is conducted at Loknete Shri Dada Patil Pharate College of Pharmacy Mandavgan Pharate.

The guidelines followed for conducting the Energy Audit are:

- BEE India's Energy Conservation Building Code: ECBC-2017
- Maharashtra Energy Development Agency ([www.mahaurja.com](http://www.mahaurja.com))
- Tata Power: [www.tatapower.com](http://www.tatapower.com)

### 1.2 Key Study Points:

| No | Particulars                                   |
|----|-----------------------------------------------|
| 1  | Study of Present Connected Load               |
| 2  | Study of Present Energy Consumption           |
| 3  | Study of Per Capita Energy Consumption        |
| 4  | Study of Lighting                             |
| 5  | Study of Energy Efficiency & Renewable Energy |

### 1.3 College Location Image:



College  
Campus

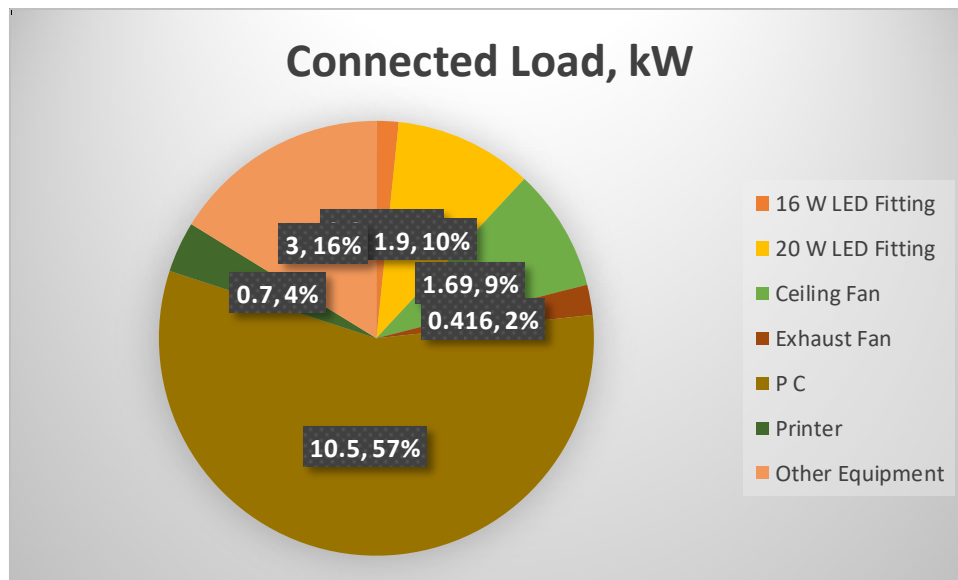
## CHAPTER-II STUDY OF CONNECTED LOAD

The major contributors to the connected load of the College include:

**Table No 1: Study of Equipment wise Connected Load:**

| No | Equipment        | Qty | Load, W/Unit | Load, kW    |
|----|------------------|-----|--------------|-------------|
| 1  | 16 W LED Fitting | 19  | 16           | 0.304       |
| 2  | 20 W LED Fitting | 95  | 20           | 1.9         |
| 3  | Ceiling Fan      | 26  | 65           | 1.69        |
| 4  | Exhaust Fan      | 8   | 52           | 0.416       |
| 5  | P C              | 70  | 150          | 10.5        |
| 6  | Printer          | 4   | 175          | 0.7         |
| 7  | Other Equipment  | 15  | 200          | 3           |
| 8  | <b>Total</b>     |     |              | <b>18.5</b> |

**Chart No 1: Study of Connected Load:**



## CHAPTER-III

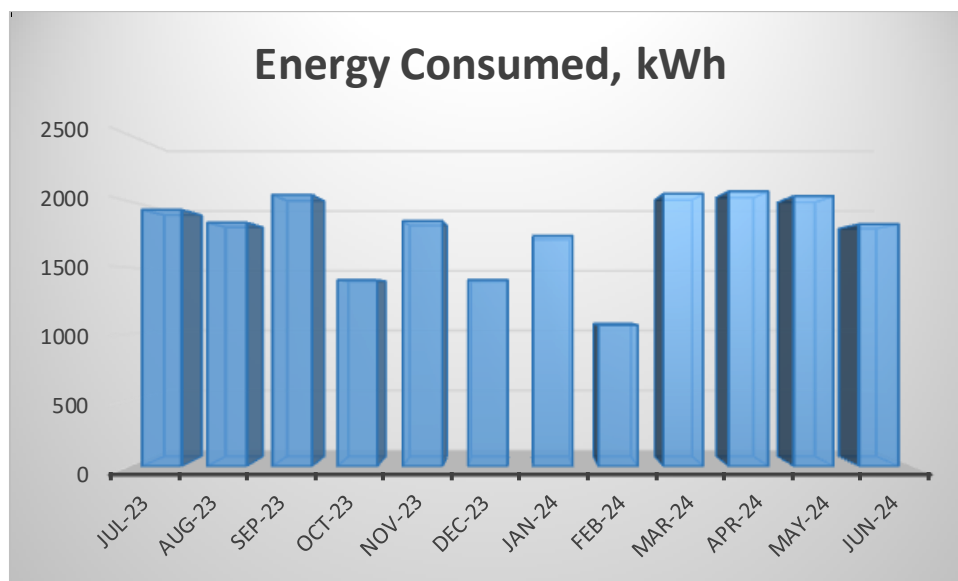
### STUDY OF PRESENT ENERGY CONSUMPTION

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

**Table No 2: Electrical Energy Consumption Analysis- 2023-24:**

| No | Month   | Energy Consumed, kWh | CO <sub>2</sub> Emissions, MT |
|----|---------|----------------------|-------------------------------|
| 1  | Jul-23  | 1936                 | 1.80                          |
| 2  | Aug-23  | 1839                 | 1.71                          |
| 3  | Sep-23  | 2050                 | 1.91                          |
| 4  | Oct-23  | 1406                 | 1.31                          |
| 5  | Nov-23  | 1852                 | 1.72                          |
| 6  | Dec-23  | 1406                 | 1.31                          |
| 7  | Jan-24  | 1740                 | 1.62                          |
| 8  | Feb-24  | 1067                 | 0.99                          |
| 9  | Mar-24  | 2057                 | 1.91                          |
| 10 | Apr-24  | 2075                 | 1.93                          |
| 11 | May-24  | 2039                 | 1.90                          |
| 12 | Jun-24  | 1828                 | 1.70                          |
| 13 | Total   | 21295                | 19.80                         |
| 14 | Maximum | 2075                 | 1.93                          |
| 15 | Minimum | 1067                 | 0.99                          |
| 16 | Average | 1774.58              | 1.65                          |

**Chart No 2: Variation in Monthly Energy Consumed, kWh:**



## CHAPTER-IV

### STUDY OF PER CAPITA ENERGY CONSUMPTION

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

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:**

| No | Particulars                               | Value | Unit      |
|----|-------------------------------------------|-------|-----------|
| 1  | Total Annual Energy Consumed              | 21295 | kWh       |
| 2  | Total No of students                      | 545   | Nos       |
| 3  | Per Capita Energy Consumption = (1) / (2) | 39.07 | 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/m<sup>2</sup>)

**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 of Class Room and the percentage usage of LED Lighting to total Lighting Load of the College.

Now, we compute the usage of LED Lighting to Total Lighting Load, as under.

**Table No 4: Computation of Lighting Power Density: Class Room:**

| No | Particulars                         | Value | Unit             |
|----|-------------------------------------|-------|------------------|
| 1  | Qty of 20 W Fittings in Class Room: | 24    | Nos              |
| 2  | Load of 20 W Fitting                | 20    | W/unit           |
| 3  | Total Load of 6 Nos, 40 W Fittings  | 480   | W                |
| 4  | Built up area of Class Room:        | 75    | m <sup>2</sup>   |
| 5  | Lighting Power Density = (3)/(4)    | 6.4   | W/m <sup>2</sup> |

#### Computation of Percentage Usage of LED Lighting to Total Lighting Load:

- The Total Lighting Load of the College is **2.68 kW**
- All the Fittings are **LEDs**
- The percentage of LEDs to Total Lighting Load is **100 %**

## CHAPTER-VI

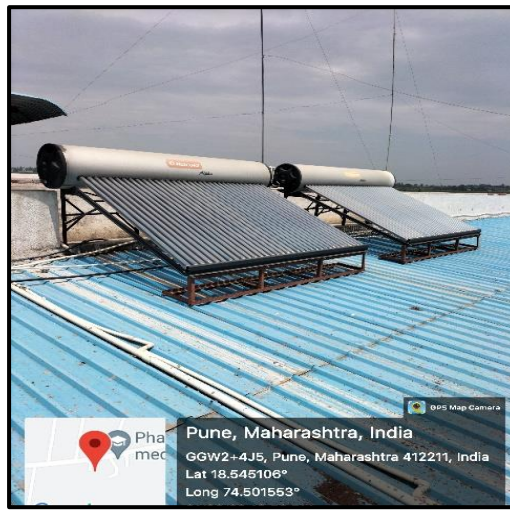
### STUDY OF RENEWABLE ENERGY & ENERGY EFFICIENCY

#### 6.1 Usage of Renewable Energy:

The College has installed Solar Thermal Water Heating System at the Hostel Block

The College has yet to install Roof top Solar PV Plant.

#### Photograph of Roof Top Solar Thermal Water Heating System:



#### 6.2 Energy Efficiency Measures adopted:

- The College has Energy Efficient LED Fittings.
- Usage of BEE STAR Rated Equipment

#### Photographs of STAR Rated AC & LED Lighting:

