

ENERGY AUDIT REPORT

of

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



Year: 2020-21

Prepared by

ENRICH CONSULTANTS

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REGISTRATION CERTIFICATES

Regn. No. EA-8192		No. 2942
National Productivity Council (National Certifying Agency)		
PROVISIONAL CERTIFICATE		
This is to certify that Mr. / Ms. <u>Achyut Yashavant Mehendale</u> son / daughter of Mr. <u>Yashavant</u> 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		Controller of Examination
Date : 10 th August 2007		

BEE ENERGY AUDITOR CERTIFICATE

MAHARASHTRA ENERGY DEVELOPMENT AGENCY An ISO 9001 : 2000 Reg. no. : RQ 91 / 2482	
 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/2021-22/CR-14/1577	22 nd April, 2021
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 Enrich Consultants Yashashree, Plot No. 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune - 411009.
Registration Category	: Empanelled Consultant for Energy Conservation Programme for Class 'A'
Registration Number	: MEDA/ECN/2021-22/Class A/EA-03
• 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 21st April, 2023 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 REGISTRATION CERTIFICATE

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ACKNOWLEDGEMENT

We Enrich Consultants, 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: 2020-21.

We are thankful to all 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. Energy Consumed & CO₂ Emission:

No	Parameter	Energy Consumed, kWh	CO ₂ emissions, MT
1	Total	9705	8.73
2	Maximum	1550	1.40
3	Minimum	308	0.28
4	Average	808.75	0.73

3. Various Measures Adopted for Energy Conservation:

- Usage of Energy Efficient LED fittings
- Maximum Usage of Day Lighting
- Solar Thermal Water Heating System at the Hostel Block

4. Usage of Alternate Energy Source:

- The College has installed Solar Thermal Water Heating System at the Hostel Block
- The College has yet to install Roof Top Solar PV Plant.
- The % of Annual Power requirement met by Alternate Energy is Nil

5. Usage of LED Lighting to Total Lighting Load:

- The LED Lighting Load is **2.204 kW**.
- The Total Lighting Load is **2.204 kW**.
- The percentage of LED Lighting Total Lighting load works out to be **100 %**

6. Assumption:

- 1 kWh (Unit) of Electrical Energy releases **0.9 Kg of CO₂** into atmosphere

7. Reference:

- For CO₂ Emission Calculations: www.tatapower.com

ABBREVIATIONS

AC	: Air conditioner
SWGP	: Shri Wagheshwar Gramvikas Pratishthan
BEE	: Bureau of Energy Efficiency
LED	: Light Emitting Diode
kWh	: kilo-Watt Hour
Qty	: Quantity
W	: Watt
kW	: Kilo Watt
PC	: Personal Computer
MT	: Metric Ton
MSEDCL	: Maharashtra State Electricity Distribution Company Limited

CHAPTER-I INTRODUCTION

1.1 Objectives:

1. To study Connected Load
2. To study Present Energy Consumption
3. To Study CO₂ emissions
4. To study Scope for usage of Alternate / Renewable Energy
5. To study usage of LED Lighting

1.2 Table No-1: General Details of College:

No	Head	Particulars
1	Name	Shri Wagheshwar Gramvikas Pratishthan's Loknete Shri Dada Patil Pharate College Of Pharmacy,
2	Address	Mandavgan Pharate, Taluka: Shirur, District: Pune 412 211
3	Affiliation	Savitribai Phule Pune University

CHAPTER-II

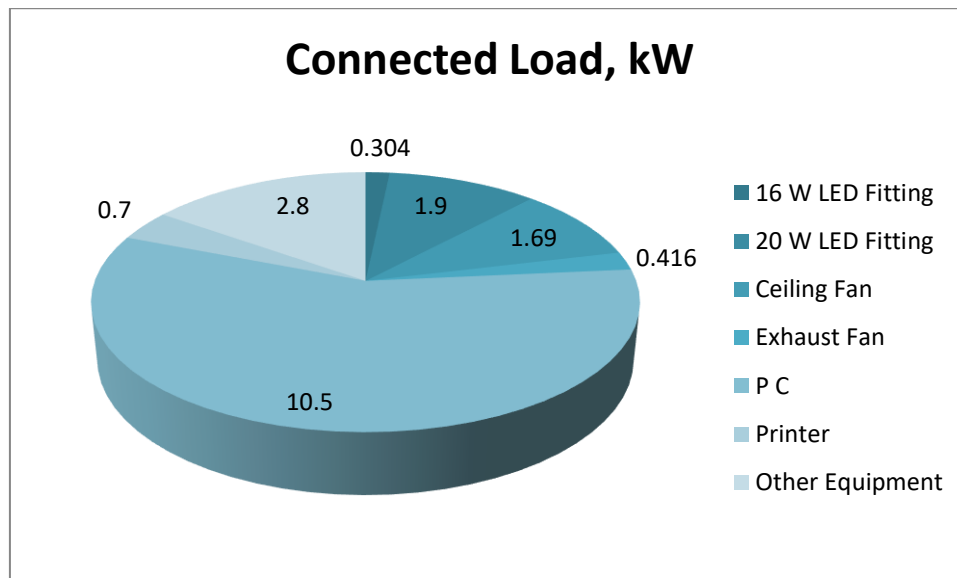
STUDY OF CONNECTED LOAD

In this chapter, we present the details of various Electrical loads as under

Table No 2: 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	14	200	2.8
8	Total			18.3

Chart No 1: Details of Connected Load:



CHAPTER-III

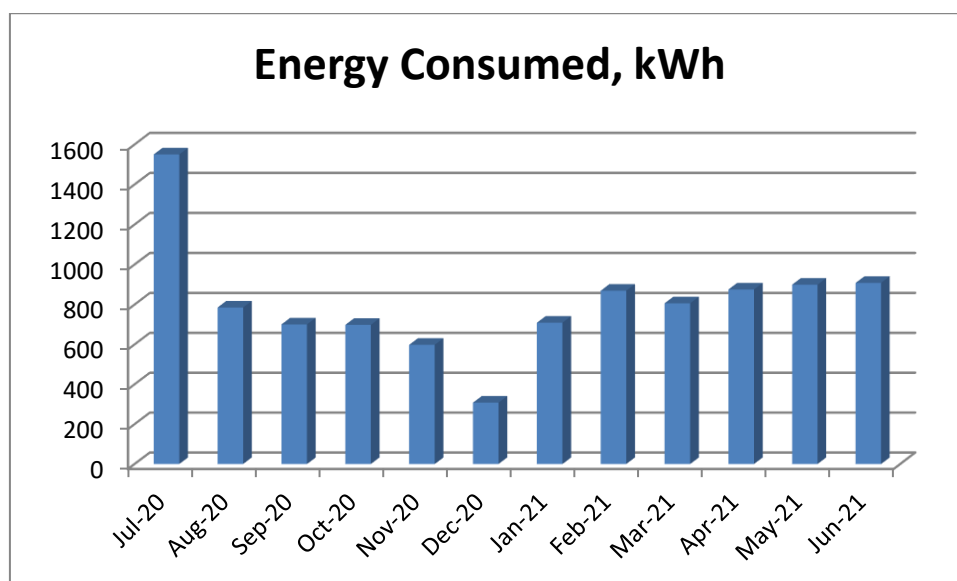
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Energy Consumed

Table No 3: Electrical Energy Consumed: 20-21:

No	Month	Energy Consumed, kWh
1	Jul-20	1550
2	Aug-20	785
3	Sep-20	700
4	Oct-20	698
5	Nov-20	598
6	Dec-20	308
7	Jan-21	709
8	Feb-21	869
9	Mar-21	806
10	Apr-21	875
11	May-21	899
12	Jun-21	908
13	Total	9705
14	Maximum	1550
15	Minimum	308
16	Average	808.75

Chart No 2: To study the variation of Month wise Energy Consumed, kWh:



CHAPTER-IV

CARBON FOOT PRINTING

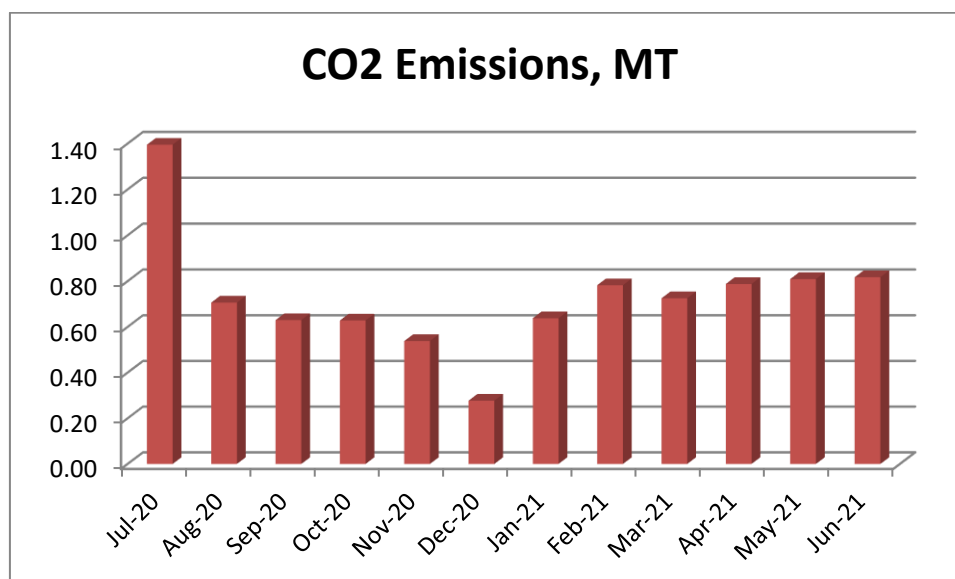
A **Carbon Foot print** is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO₂ Emissions:**

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO₂** into atmosphere

Table No 4: Month wise CO₂ Emissions:

No	Month	Energy Consumed, kWh	CO2 Emissions, MT
1	Jul-20	1550	1.40
2	Aug-20	785	0.71
3	Sep-20	700	0.63
4	Oct-20	698	0.63
5	Nov-20	598	0.54
6	Dec-20	308	0.28
7	Jan-21	709	0.64
8	Feb-21	869	0.78
9	Mar-21	806	0.73
10	Apr-21	875	0.79
11	May-21	899	0.81
12	Jun-21	908	0.82
13	Total	9705	8.73
14	Maximum	1550	1.40
15	Minimum	308	0.28
16	Average	808.75	0.73

Chart No 3: Representation of Month wise CO₂ Emissions:



CHAPTER-V

STUDY OF USAGE OF ALTERNATE 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:



CHAPTER-VI

STUDY OF USAGE OF LED LIGHTS

In the following Table, we present the percentage of usage of LED lights to Total Lighting Load.

Table No 5: Study of % LED Lighting Load to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 16 W LED Fittings	19	Nos
2	Load of 16 W LED Fitting	16	W/unit
3	Total Load of 16 W LED fitting	0.304	kW
4	No of 20 W LED Fittings	95	Nos
5	Load of 20 W LED Fitting	20	W/unit
6	Total Load of 20 W LED fitting	1.9	kW
7	Total LED Lighting Load=3+6	2.204	kW
8	Total Lighting Load=3+6	2.204	kW
9	% of LEDs to Total Lighting Load= $7 \times 100 / 8$	100	%