

ENERGY AUDIT REPORT

of

ASM's INSTITUTE OF PROFESSIONAL STUDIES,

Pimpri, Pune 411 018



Year: 2020-21

Prepared by

Enrich Consultants

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MAHARASHTRA ENERGY DEVELOPMENT AGENCY

An ISO 9001 : 2000 Reg. no. : RQ 91 / 2462



Maharashtra Energy Development Agency

(Government of Maharashtra Institution)

Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,

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ECN/2021-22/CR-14/1577

22nd 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 Mukhtangan 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)



Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
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Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/ASMCSIT/20-21/01

Date: 19/7/2021

CERTIFICATE

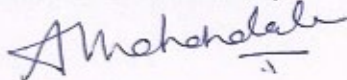
This is to certify that we have conducted Energy Audit at ASM's, Institute of Professional Studies, Pimpri, Pune 411 018 in the year 2020-21.

The Institute has adopted Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting

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

For Enrich Consultants,



A Y Mehendale,
Certified Energy Auditor
EA-8192



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ACKNOWLEDGEMENT

We Enrich Consultants, Pune, express our sincere gratitude to the management of ASM's Institute of Professional Studies Pimpri, Pune 411 018, for awarding us the assignment of Energy Audit of their Pimpri campus for the Year: 20-21.

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



EXECUTIVE SUMMARY

1. **ASM's Institute of Professional Studies, Pimpri, 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	29298	26.37
2	Maximum	3690	3.32
3	Minimum	1364	1.23
4	Average	2441	2.20

3. Various Majors Adopted for Energy Conservation:

- Usage of Energy Efficient LED fittings
- Maximum Usage of Day Lighting

4. Usage of Alternate Energy Source:

- The Institute 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 **4.08 kW**.
- The Total Lighting Load is **14.16 kW**.
- The percentage of LED Lighting Total Lighting load works out to be **28.81 %**

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
ASM	: Audyogik Shikshan Mandal
BEE	: Bureau of Energy Efficiency
CFL	: Compact Fluorescent Lamp
FTL	: Fluorescent Tube Light
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 and Present Energy Consumption
2. To Study CO₂ emissions
3. To study Scope for usage of Alternate / Renewable Energy
4. To study usage of LED Lighting

1.2 Table No-1: General Details of Institute:

No	Head	Particulars
1	Name	ASM's Institute of Professional Studies
2	Address	Pimpri, Pune 411 018
3	Year of Establishment	2008
3	Affiliation	Savitribai Phule Pune University



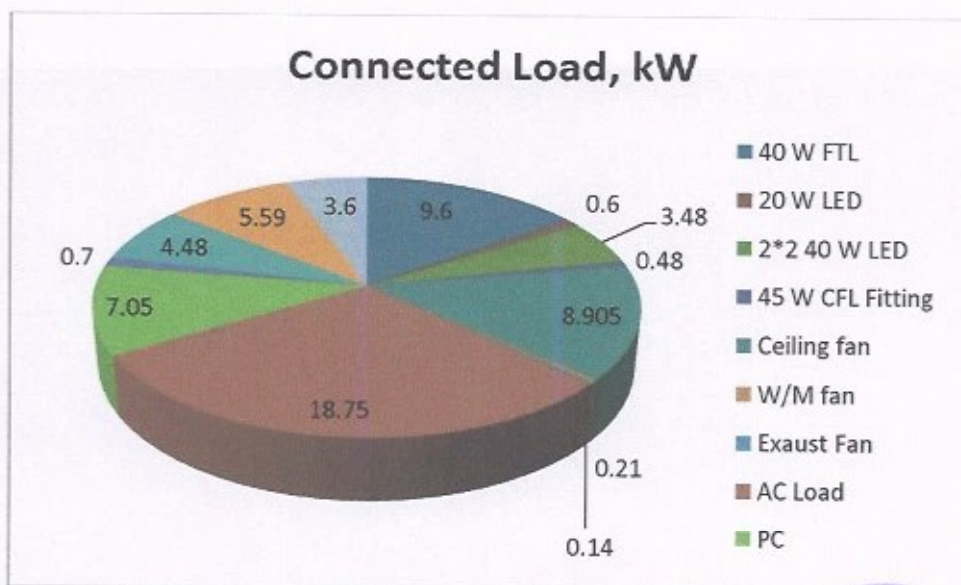
CHAPTER-II STUDY OF CONNECTED LOAD

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	40 W FTL	240	40	9.6
2	20 W LED	30	20	0.6
3	2*2 40 W LED	87	40	3.48
4	45 W CFL Fitting	10	48	0.48
5	Ceiling fan	137	65	8.905
6	W/M fan	4	52	0.21
7	Exhaust Fan	4	36	0.14
8	AC Load		1250	18.75
9	PC	47	150	7.05
10	Printer	4	175	0.7
11	Water Pump	2	2238	4.48
12	Lift	1	5595	5.60
13	Other Equipment	18	200	3.6
13	Total			64

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	Apr-20	1686
2	May-20	1676
3	Jun-20	1854
4	Jul-20	2026
5	Aug-20	2023
6	Sep-20	3257
7	Oct-20	3500
8	Nov-20	3269
9	Dec-20	4260
10	Jan-21	4534
11	Feb-21	3531
12	Mar-21	4377
13	Total	35994
14	Maximum	4534
15	Minimum	1676
16	Average	3000

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

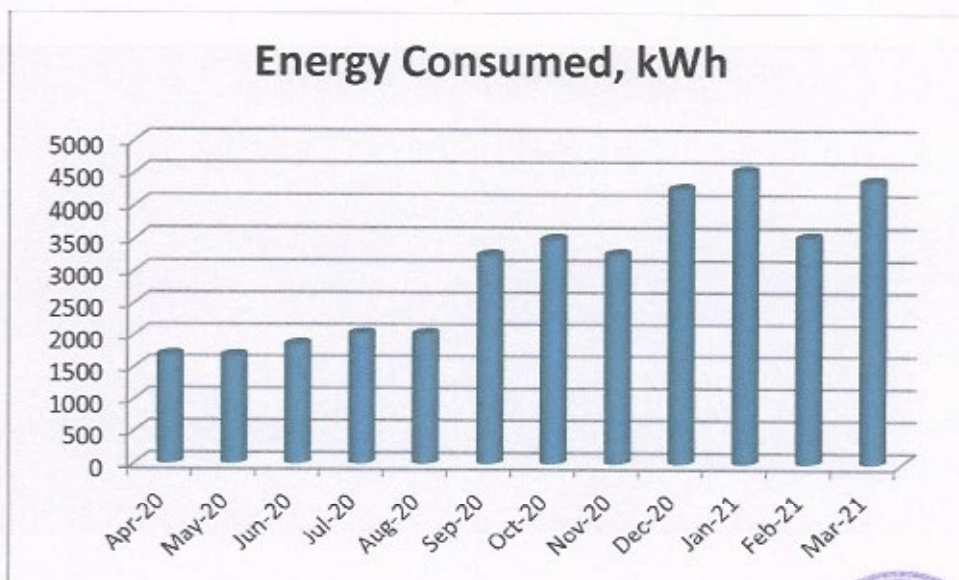


Table No 4: Important parameters:

No	Parameter	Energy Consumed, kWh
1	Total	35994
2	Maximum	4534
3	Minimum	1676
4	Average	3000



CHAPTER-IV CARBON FOOT PRINTING

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the Institute for performing its day to day activities

The Institute uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO₂ Emissions:

The basis of Calculation for CO₂ emissions due to Electrical Energy are: 1 Unit (kWh) of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere

Based on the above Data we compute the CO₂ emissions which are being released in to the atmosphere by the Institute due to its Day to Day operations

Table No 5: Month wise CO₂ Emissions:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Apr-20	1686	1.52
2	May-20	1676	1.51
3	Jun-20	1854	1.67
4	Jul-20	2026	1.82
5	Aug-20	2023	1.82
6	Sep-20	3257	2.93
7	Oct-20	3500	3.15
8	Nov-20	3269	2.94
9	Dec-20	4260	3.83
10	Jan-21	4534	4.08
11	Feb-21	3531	3.18
12	Mar-21	4377	3.94
13	Total	35994	32.39
14	Maximum	4534	4.08
15	Minimum	1676	1.51
16	Average	3000	2.70

Chart No 3: Representation of Month wise CO₂ Emissions:

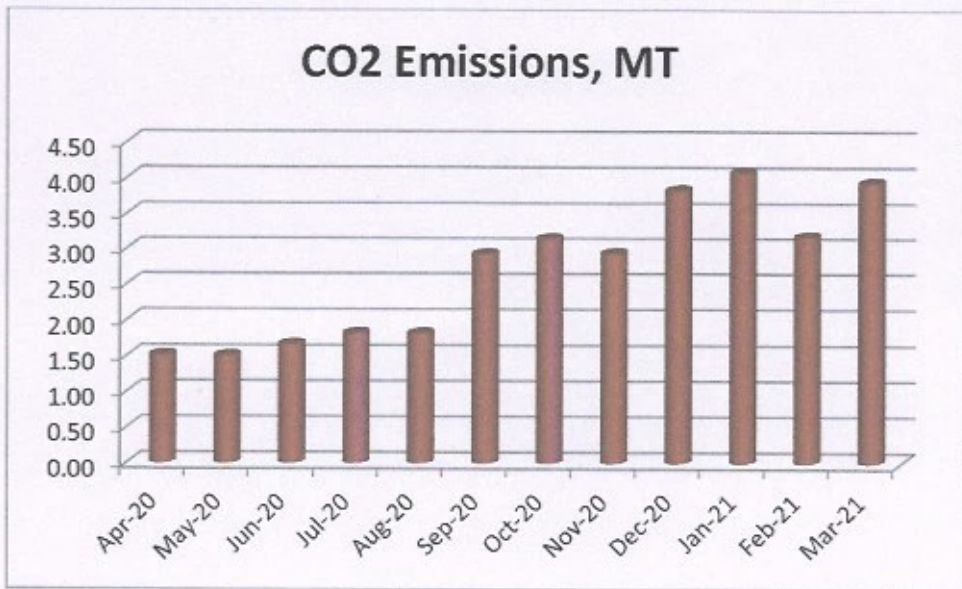


Table No 6: Key observations:

No	Parameter	Energy Consumed, kWh	CO ₂ emissions, MT
1	Total	35994	32.39
2	Maximum	4534	4.08
3	Minimum	1676	1.51
4	Average	3000	2.70

CHAPTER-V

STUDY OF USAGE OF ALTERNATE ENERGY

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

As on Date the percentage of Annual Power requirement by Alternate Energy is nil.



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 7: Study of % LED Lighting Load to Total Lighting Load:

No	Particulars	Value	Unit
1	Qty of 40 W FTL Fittings	240	Nos
2	Load per Unit of 40 W FTL Fitting	40	W/Unit
3	Total Load of 40 W FTL Fittings	9.6	kW
4	Qty of 20 W LED Fittings	30	Nos
5	Load per Unit of 20 W LED Fitting	20	W/Unit
6	Total Load of 20 W LED Fittings	0.6	kW
7	Qty of 40 W LED Fittings	87	Nos
8	Load per Unit of 40 W LED Fitting	40	W/Unit
9	Total Load of 40 W LED Fittings	3.48	kW
10	Qty of 45 W CFL Fittings	10	Nos
11	Load per Unit of 45 W CFL Fitting	48	W/Unit
12	Total Load of 45 W CFL Fittings	0.48	kW
13	Total LED Lighting Load =6+9	4.08	kW
14	Total Lighting Load= 3+6+9+12	14.16	kW
15	Percentage of LEDs to Total Lighting Load= $13 \times 100 / 14$	28.81	%