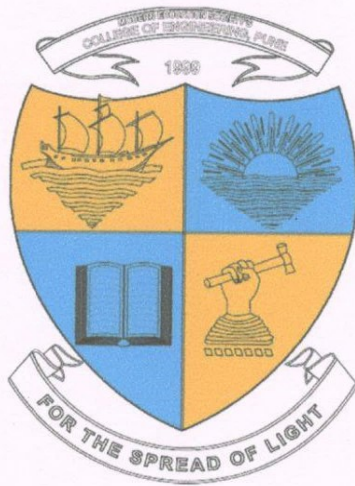


GREEN AUDIT REPORT
of
Modern Education Society's
College of Engineering, Pune 411 001



Year: 2020-21

Prepared by:

Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com



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,

Aundh, Pune, Maharashtra 411067

Ph No: 020-35000450

Email: eee@mahaurja.com, Web: www.mahaurja.com

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 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)



Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Mukhtangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/MESCOE/20-21/02

Date: 20/8/2021

CERTIFICATE

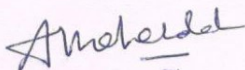
This is to certify that we have conducted Green Audit at Modern Education Society's College of Engineering, Pune 411 001, in the Academic year 2020-21.

The College has adopted following Green Initiatives:

- Usage of Energy Efficient LED Light Fitting
- Usage of BEE STAR Rated Energy Efficient Equipment
- Maximum Usage of Day Lighting
- Installation of Roof Top Solar PV Plant of Capacity **8 kWp**
- Provision of Separate bins for Dry & Wet Waste
- Installation of Vermi Composting Plant
- Maintenance of good Internal Road
- Tree Plantation in the campus
- Implementation of Rain Water Harvesting Project
- Provision of Ramp for Divyangajan
- Provision of Sanitary Waste Incinerator

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 Modern Education Society's College of Engineering, Pune 411 001, for awarding us the assignment of Green Audit of their Campus for the Academic Year: 2020-21.

We are thankful to:

- Dr. S. S. Sarawade, I/C Principal
- Dr. P. P. Mane, IQAC Coordinator

We are also thankful to other Staff members for helping us during the field study.



EXECUTIVE SUMMARY

1. **Modern Education Society's College of Engineering Pune** consumes Energy in the form of **Electrical Energy** used for various gadgets, office & other facilities

2. Present Energy Consumption & CO₂ Emissions:

No	Parameter/ Value	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Total	46213	41.59
2	Maximum	5925	5.33
3	Minimum	672	0.60
4	Average	3851.08	3.47

3. Various initiatives taken for Energy Conservation:

- Usage of Energy Efficient BEE STAR Rated Equipment
- Usage of Energy Efficient LED Lighting
- Maximum Usage of Day Lighting
- Installation of Roof Top Solar PV Plant of Capacity **8 kWp**.

4. Usage of Renewable Energy & CO₂ Emission Reduction:

- The College has installed Roof Top Solar PV Plant of Capacity **8 kWp**.
- The Electrical Energy generated in 20-21 is **9600 kWh**.
- Reduction in CO₂ Emissions in 2020-21 works out to be **8.64 MT**.

5. Waste Management:

5.1 Solid Waste Management:

The Waste is segregated at source and the recyclable waste, like paper, plastic waste is handed over to Authorized waste collecting agent for further recycling.

5.2 Organic Waste Management:

The College has installed a Vermi Composting Plant and the organic Waste is composted in the Plant, which is further used in the own garden.

5.3 E-Waste Management:

The E-Waste is disposed of through Authorized E-Waste collecting agency.

6. Rain Water Harvesting:

The College has installed the Rainwater harvesting project, the rain water falling on the terrace is collected and is used for recharging the bore well.



7. Green & Sustainable Initiatives

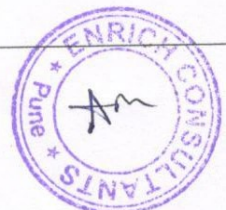
- Maintenance of good Internal Road
- Maintenance of Internal Garden: 500 Plus Trees, Plants
- Provision of Ramp for Divyangajan
- Provision of Sanitary Waste Incinerator
- Display of Posters on Resource Conservation

8. Notes & Assumptions:

1. 1 kWh of Electrical Energy releases **0.9 Kg** of **CO₂** into atmosphere
2. Annual Solar Energy Generation Days: **300 Nos.**

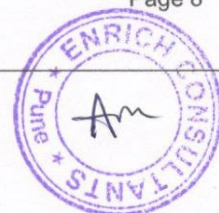
9. References:

- For CO₂ Emissions: www.tatapower.com
- For Roof Top Solar Energy generation: www.solarrooftop.gov.in



ABBREVIATIONS

BEE	Bureau of Energy Efficiency
kWh	Kilo Watt Hour
LPD	Liters Per Day
Kg	Kilo Gram
MT	Metric Ton
CO ₂	Carbon Di Oxide
Qty	Quantity



CHAPTER-I INTRODUCTION

1.1 Objectives:

1. To study present Energy Consumption
2. To Study CO₂ emissions
3. To study usage of Renewable Energy
4. Study of Waste Management
5. Study of Rain Water Harvesting
6. Study of Green & Sustainable Practices

1.2 General Details of College: Table No 1:

No	Head	Particulars
1	Name of Institution	Modern Education Society's College of Engineering
2	Address	19, Late Prin. V. K. Joag Path, Wadia College Campus, Pune 411 001
3	Year of Establishment	July 1999
4	Affiliation	Savitribai Phule Pune University



CHAPTER-II

STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Electrical Bill Analysis- 2020-21:

No	Month	Energy Consumed kWh
1	Jul-20	672
2	Aug-20	1891
3	Sep-20	2213
4	Oct-20	4550
5	Nov-20	3660
6	Dec-20	3921
7	Jan-21	4110
8	Feb-21	5470
9	Mar-21	5925
10	Apr-21	4667
11	May-21	4641
12	Jun-21	4493
13	Total	46213
14	Maximum	5925
15	Minimum	672
16	Average	3851.08

Chart No 1: Variation in Monthly Energy Consumption:

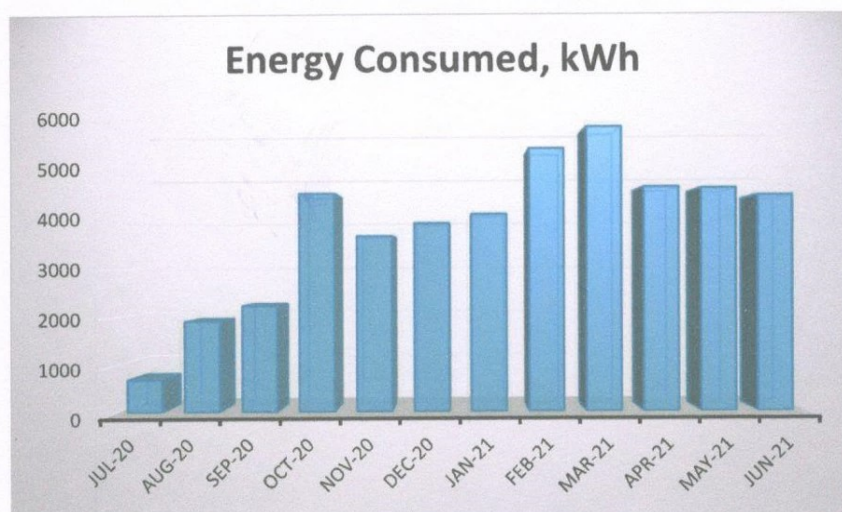


Table No 3: Variation in Important Parameters:

No	Parameter/ Variation	Energy Consumed, kWh
1	Total	46213
2	Maximum	5925
3	Minimum	672
4	Average	3851.08



CHAPTER III

STUDY OF CARBON FOOTPRINTING

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 College for performing its day to day activities

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO₂ Emissions:

The basis of Calculation for CO₂ emissions due to LPG & Electrical Energy are as under

- 1 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 College due to its Day to Day operations

Table No 4: Month wise CO₂ Emissions:

No	Month	Energy Consumed kWh	CO ₂ Emissions, MT
1	Jul-20	672	0.60
2	Aug-20	1891	1.70
3	Sep-20	2213	1.99
4	Oct-20	4550	4.10
5	Nov-20	3660	3.29
6	Dec-20	3921	3.53
7	Jan-21	4110	3.70
8	Feb-21	5470	4.92
9	Mar-21	5925	5.33
10	Apr-21	4667	4.20
11	May-21	4641	4.18
12	Jun-21	4493	4.04
13	Total	46213	41.59
14	Maximum	5925	5.33
15	Minimum	672	0.60
16	Average	3851.08	3.47



Chart No 2: Month wise CO₂ Emissions:

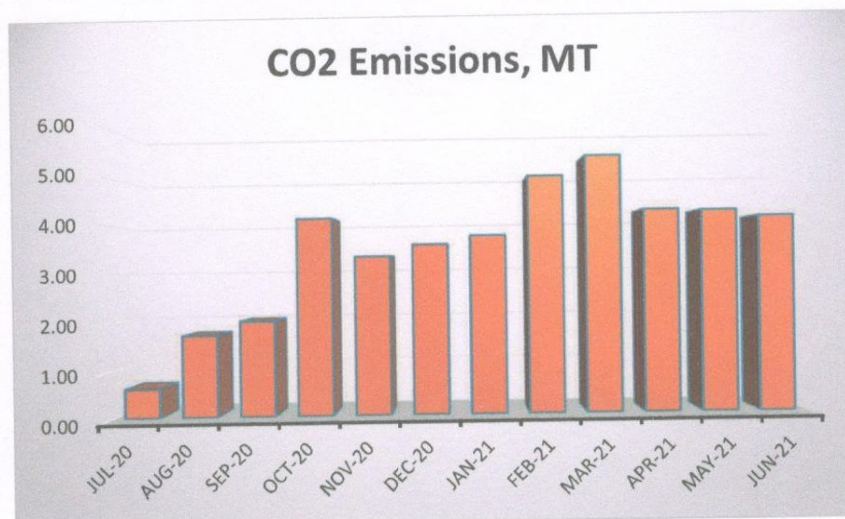


Table No 5: Variation in Important Parameters:

No	Parameter/ Value	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Total	46213	41.59
2	Maximum	5925	5.33
3	Minimum	672	0.60
4	Average	3851.08	3.47



CHAPTER IV STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed Roof Top Solar PV Plant of Capacity **8 kWp**.

In the following Table, we compute the Annual Reduction in CO₂ Emissions due to installation of Roof Top Solar PV Plant.

Table No 6: Computation of Annual Reduction in CO₂ Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	8	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy generation Days	300	Nos
4	Energy Generated in the Year: 20-21	9600	kWh
5	1 kWh of Electrical Energy saves	0.9	Kg/kWh
6	Qty of CO ₂ Saved by Solar PV Plant = (4)*(5) /1000	8.64	MT of CO ₂

Photograph of Roof Top Solar PV Plant:



CHAPTER V STUDY OF WASTE MANAGEMENT

5.1 Solid Waste Management:

The Waste is segregated at source and the recyclable waste, like paper waste is handed over to authorized waste collecting agent for further recycling.

Photograph of Waste Collection Bins:



5.2 Organic Waste Management:

The Bio degradable waste like leafy waste is composted in a Vermi composting Plant.

Photograph of Vermi Composting Plant:



5.3 E-Waste Management: The E-Waste is disposed of through Authorized Agency.

CHAPTER-VI

STUDY OF RAIN WATER HARVESTING

The College has implemented the Rain Water Harvesting Project. The College has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to increase the underground water level.

Photograph of Rain water Harvesting Pipe:



Photograph of Rain water Harvesting Recharging Well Section:



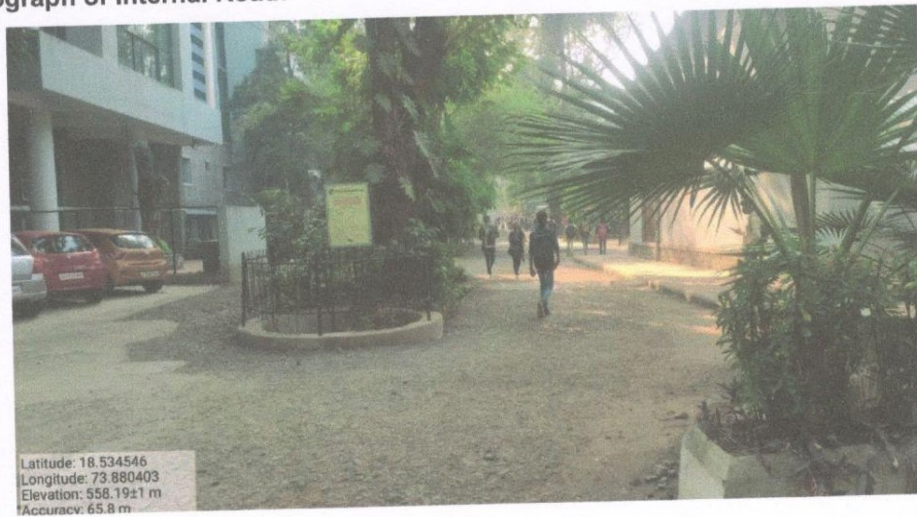
CHAPTER-VII

STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads:

The College has well maintained internal road to facilitate the easy movement of the students within the campus.

Photograph of Internal Road:



7.2 Internal Tree Plantation:

The College has well maintained landscaped garden in the campus.

Photograph of Tree plantation:



7.3 Provision of Ramp:

For easy movement of Divyangajan, the College has made provision of Ramp at the main entrance.

Photograph of Ramp:



7.4 Provision of Sanitary Waste Incinerator:

For disposal of Sanitary Waste, a Sanitary Waste Incinerator is installed in the campus.

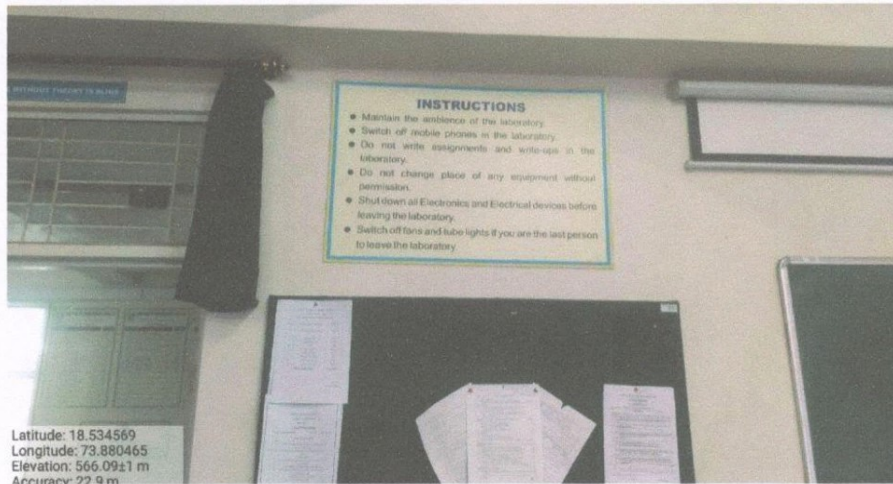
Photograph of Sanitary Waste Incinerator:



7.5 Creation of Awareness about Energy Conservation:

The College has displayed posters emphasizing on importance of Energy Conservation.

Photograph of Poster on Energy Conservation:



**ANNEXURE-1:
LIST OF TREES:**

Sr. No.	Tree Variety	No. of Trees
1	Ordinary	331
2	Neem	009
3	Mango	016
4	Jamun	004
5	Ashoka	124
6	Umber	003
7	Nilgiri	015
8	Subabul	010
9	Coconut	013
10	Pepal	009
11	Badam	003
12	Palm	019
13	Gulmohar	008
14	Total	564

Photograph of Internal Garden:



Latitude: 18.532783
Longitude: 73.860101
Elevation: 560.89±1 m
Accuracy: 56.8 m

