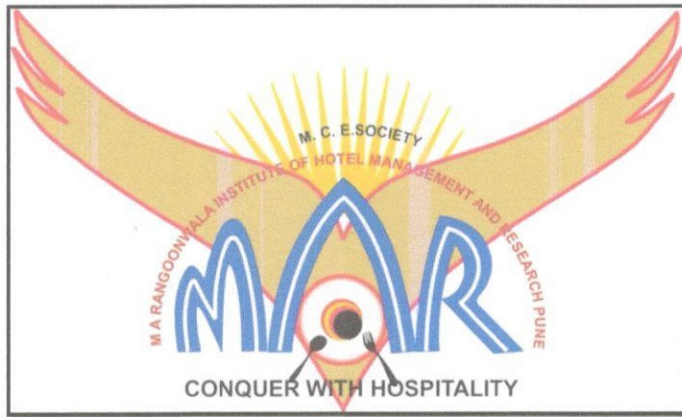


GREEN AUDIT REPORT

of

Maharashtra Cosmopolitan Education Society's,
**M. A. RANGOONWALA INSTITUTE OF HOTEL
MANAGEMENT & RESEARCH PUNE**

Azam Campus, K B Hidaytullah Road, Camp, Pune 411 001



Year: 2021-22

Prepared by

ENGRESS SERVICES

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



REGISTRATION CERTIFICATES

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

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/2022-23/CR-43/1709 10th 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
Yashshree, 26, Nirmal Bag Society,
Near Mukhtangan 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-32.*

- 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 **09th 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)

MEDA EMPANELMENT CERTIFICATE

GEM Certificate

ASOCHAM hereby certifies that

Mr. A Y Mehendale

has successfully passed the

Green and Eco-friendly Movement Certified Professional Test (GEM CP)

with

"Excellent Performance"

on

06 June, 2022

He/she is now eligible to execute the GEM Sustainability Certification Projects. ASOCHAM feels proud to award the GEM Certified Professional title to him/her.

Pankaj R. Dharkar
Chairman, GEM

Deepak Sood
Secretary General, ASOCHAM

GEM CP 22/788

ASOCHAM GEM CP CERTIFICATE



ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Mukhtangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: engress123@gmail.com

Ref: ES/MARIHM/21-22/02

Date: 15/7/2022

CERTIFICATE

This is to certify that we have conducted Green Audit at Maharashtra Cosmopolitan Education Society's M. A. Rangoonwala Institute of Hotel Management & Research Pune, Camp, Pune 411 001, in the Year 2021-22.

The Institute has adopted following Green & Sustainable Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 50 kWp Roof Top Solar PV Plant
- Segregation of Waste at source
- Vermi Composting Pit for conversion of organic Waste
- Installation of Bio Gas Plant, for conversion of Leftover Food Waste
- Implementation of Rain Water Harvesting Project
- Good Internal Road
- Internal Tree Plantation
- Provision of Ramp for Divyangajan
- Creation of awareness on Water Conservation by Display of Posters
- Tree Plantation Event in the Campus

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

For Engress Services,



A Y Mehendale,
Certified Energy Auditor, EA-8192
ASSOCHAM GEM Certified Professional: GEM: 22/788



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ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Maharashtra Cosmopolitan Education Society's M. A. Rangoonwala Institute of Hotel Management & Research Pune, Camp, Pune 411 001, for awarding us the assignment of Green Audit of their Pune Campus for the Year: 2021-22.

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

EXECUTIVE SUMMARY

1. Maharashtra Cosmopolitan Education Society's M. A. Rangoonwala Institute of Hotel Management & Research Pune, Camp, Pune 411 001 consumes Energy in the form of Electrical Energy & LPG; used for various Equipment.

2. Present Energy, LPG Consumption & CO₂ Emission:

No	Parameter /Value	Energy Purchased, kWh	LPG Consumed, Kg	CO ₂ Emissions, MT
1	Total	25240	1330	26.28
2	Maximum	2365	139	2.43
3	Minimum	1896	95	1.97
4	Average	2103.33	110.83	2.19

3. Measures Adopted for Energy Conservation:

- Usage of Energy efficient LED fittings
- Usage of BEE STAR Rated Equipment
- Installation of **50 kWp** Roof Top Solar PV Plant

4. Usage of Renewable Energy & CO₂ Emission Reduction:

- The Institute has installed **50 kWp** Roof Top Solar PV Plant
- Energy generated by Solar PV Plant in 21-22 is **60000 kWh**
- Reduction in CO₂ Emissions by usage of Solar Energy in 21-22 is **54 MT**.

5. Waste Management:

5.1 Segregation of Waste at Source:

The waste is segregated at the source. There are Waste Collection Bins at various locations, to collect the Waste.

5.2 Organic Waste Management:

The Institute has installed a Vermi Composting Pit for conversion of Organic Waste.

5.3 Bio Gas Unit:

The Institute has installed a Bio Gas Unit for conversion of Leftover Food Waste.

5.4 E Waste Management:

The E Waste is disposed by the Society.

6. Rain Water Harvesting:

The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is run down through Pipes, filtered and is stored in a well & is further used for domestic purpose.

7. Green & Sustainable Practices:

- Good internal road
- Internal Tree Plantation.
- Provision of Ramp for Divyangajan
- Creation of Awareness in respect of Water Conservation by display of Posters
- Tree Plantation Event in the Campus

8. Assumptions:

1. Electrical Energy consumption is computed based on Capacity Utilization Factor
2. **1 kWh** of Electrical Energy releases **0.9 Kg of CO₂** into atmosphere
3. **1 Kg of LPG** releases **2.68 Kg of CO₂** into atmosphere
4. Energy generated by Roof Top Solar PV Plant: **4 kWh/kWp per Day**
5. Annual Solar Energy generation Days: **300 Nos**

9. References:

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

ABBREVIATIONS

LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
MT	:	Metric Ton



CHAPTER-I INTRODUCTION

1.1 Objectives:

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

1.2 Table No 1: General Details of Institute:

No	Head	Particulars
1	Name	Maharashtra Cosmopolitan Education Society's, M. A. Rangoonwala Institute of Hotel Management & Research Pune
2	Address	K B Hidaytullah Road, Camp, Pune 411 001
3	Year of Establishment	2006

1.3 Google Earth Location Image:



Institute
Campus



CHAPTER-II

STUDY OF ENERGY CONSUMPTION

In this chapter, we present the analysis of Electricity Energy Consumption

Table No 2: Electrical Energy & LPG Consumption Analysis- 2021-22:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg
1	Apr-21	2190	114
2	May-21	2219	112
3	Jun-21	2115	113
4	Jul-21	2365	114
5	Aug-21	2164	116
6	Sep-21	2170	112
7	Oct-21	1936	116
8	Nov-21	2036	139
9	Dec-21	1996	106
10	Jan-22	1896	98
11	Feb-22	2036	95
12	Mar-22	2117	95
13	Total	25240	1330
14	Maximum	2365	139
15	Minimum	1896	95
16	Average	2103.33	110.83

Chart No 1: To study the variation of Month wise Energy Purchased, kWh:

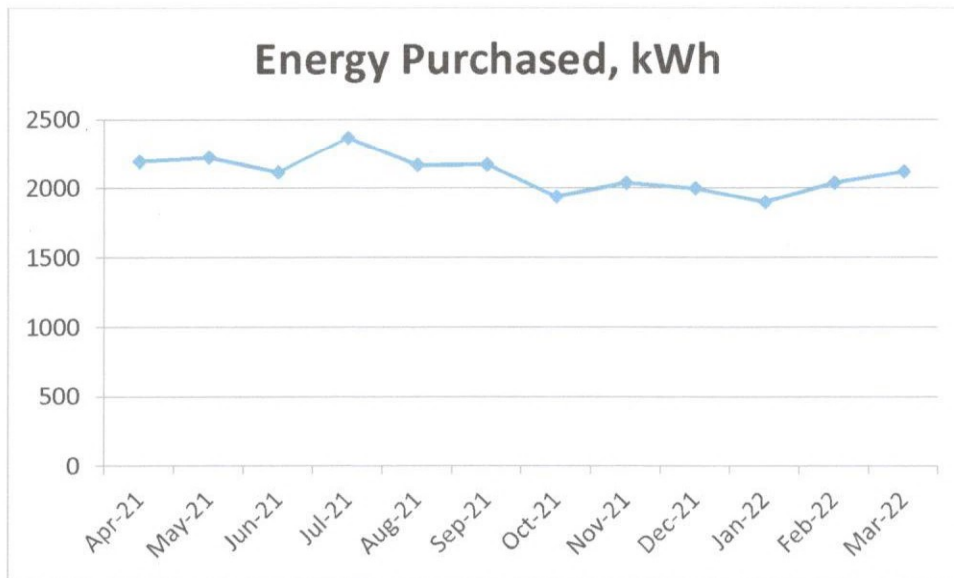
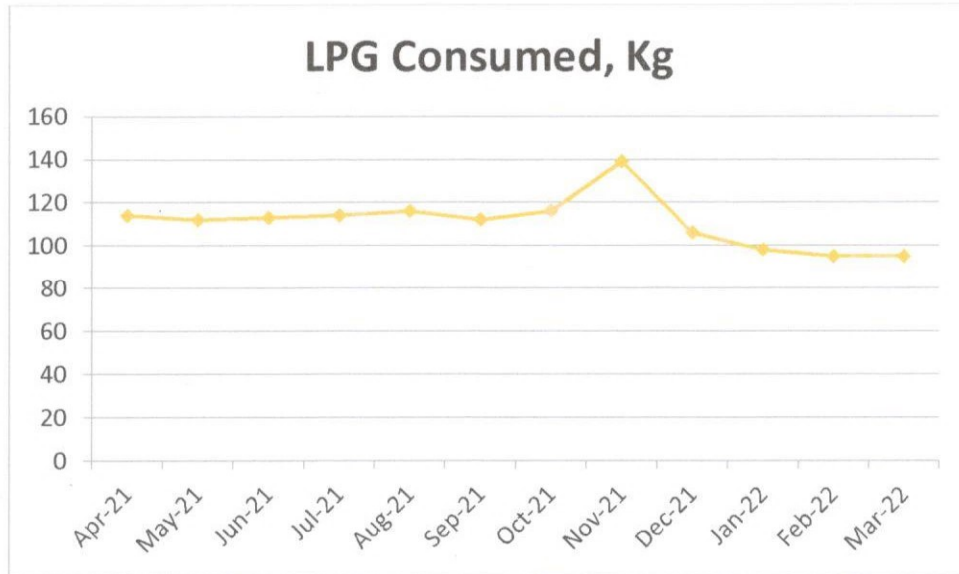


Chart No 2: To study the variation of Month wise LPG Consumed, kWh:**Table No 3: Key Parameters:**

No	Parameter	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	25240	1330
2	Maximum	2365	139
3	Minimum	1896	95
4	Average	2103.33	110.83

CHAPTER-III

STUDY OF 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 & LPG is:

- 1 kWh of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere
- 1 Kg of LPG releases 2.68 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 4: Month wise CO₂ Emissions:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg	CO ₂ Emissions, MT
1	Apr-21	2190	114	2.28
2	May-21	2219	112	2.30
3	Jun-21	2115	113	2.21
4	Jul-21	2365	114	2.43
5	Aug-21	2164	116	2.26
6	Sep-21	2170	112	2.25
7	Oct-21	1936	116	2.05
8	Nov-21	2036	139	2.20
9	Dec-21	1996	106	2.08
10	Jan-22	1896	98	1.97
11	Feb-22	2036	95	2.09
12	Mar-22	2117	95	2.16
13	Total	25240	1330	26.28
14	Maximum	2365	139	2.43
15	Minimum	1896	95	1.97
16	Average	2103.33	110.83	2.19

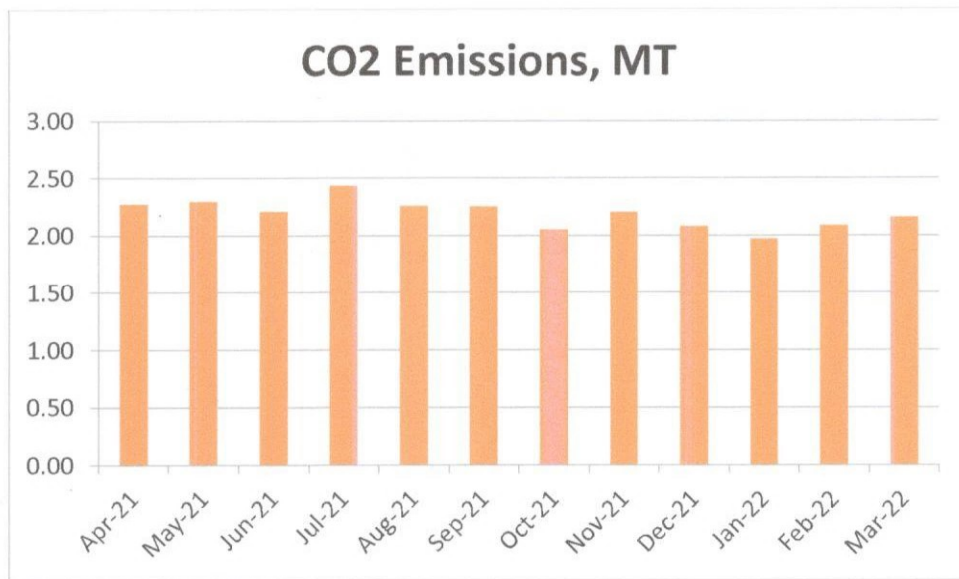
Chart No 3: Representation of Month wise CO₂ emissions:

Table No 5: Key Parameters:

No	Value	Energy Purchased, kWh	LPG Consumed, Kg	CO ₂ emissions, MT
1	Total	25240	1330	26.28
2	Maximum	2365	139	2.43
3	Minimum	1896	95	1.97
4	Average	2103.33	110.83	2.19

CHAPTER-IV

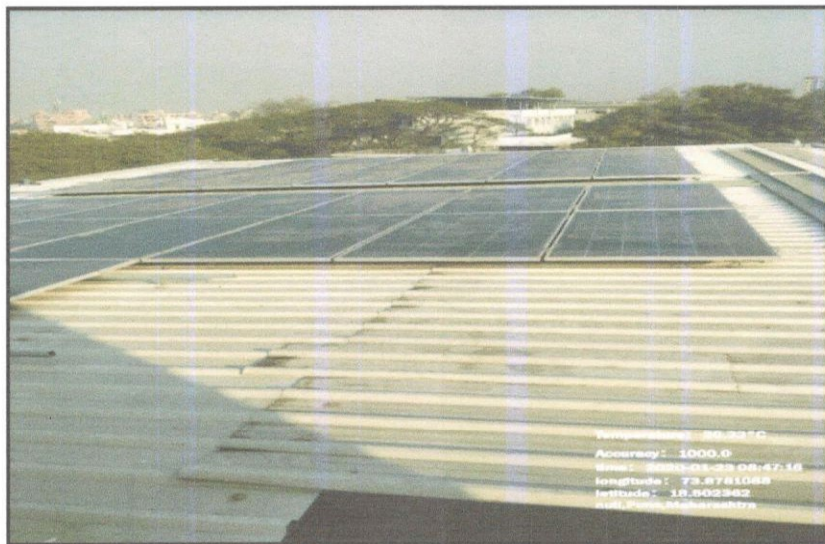
STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed Roof Top Solar PV Plant of Capacity **50 kWp**
We now calculate the reduction in CO₂ Emission due to Solar PV Plant.

Table No 6: Computation of Reduction in CO₂ Emission:

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	50	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	60000	kWh
5	1 kWh of Electrical Energy is equivalent to	0.9	Kg of CO ₂
6	Annual Reduction in CO₂ Emission = (4) * (5) /1000	54	MT

Photograph of Roof Top Solar PV Plant:



CHAPTER V STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The Institute has good housekeeping practices. The Waste is segregated at source. Waste collection Bins are placed at strategic locations.

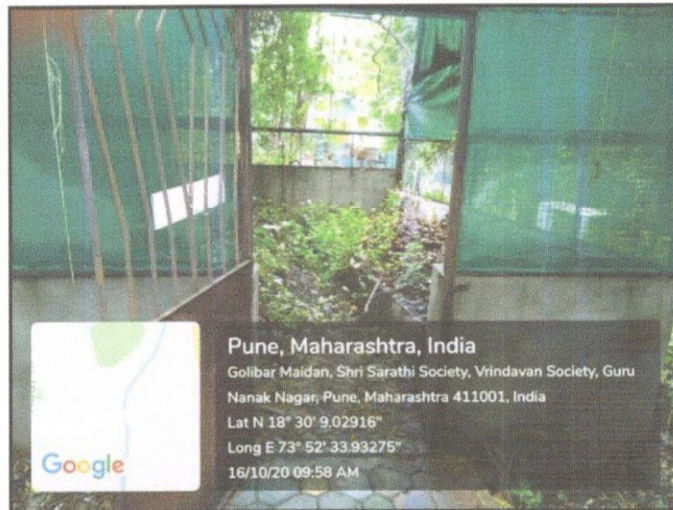
Photograph of Waste Collection Bin:



5.2 Organic Waste Management:

The Institute has installed a Vermi Composting Pit for conversion of Organic Waste.

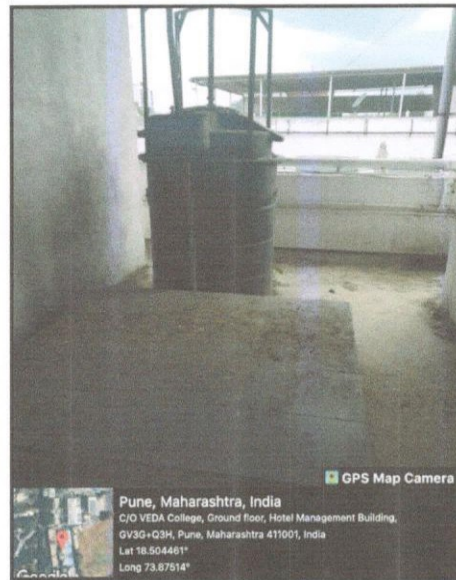
Photograph of Vermi Composting Pit:



5.3 Bio Gas Unit:

The Institute has installed a Bio Gas Unit for conversion of Leftover Food Waste.

Photograph of Bio Gas Unit:



5.4 E Waste Management:

The E Waste is disposed by the Society.

CHAPTER-VI STUDY OF RAIN WATER HARVESTING

The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is run down through Pipes, filtered and is stored in a well & is further used for domestic purpose.

Photograph of Rain Water Carrying Pipe:



Rain Water
Carrying Pipe

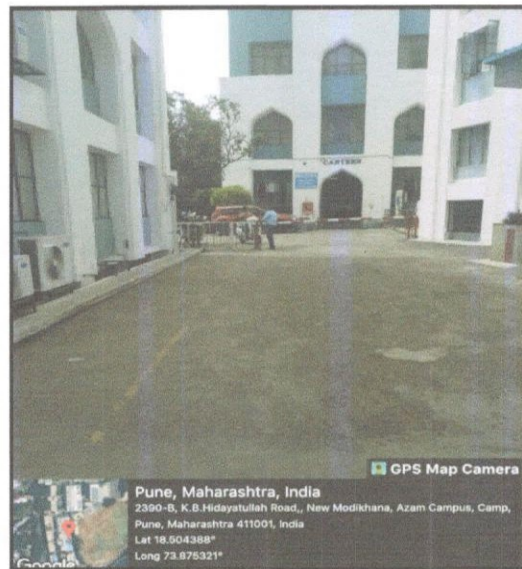
CHAPTER-VII

STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Internal Road:

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

Photograph of Internal Road:



7.2 Tree Plantation:

The Institute has Tree Plantation in the campus.

Photograph of Internal Tree Plantation:



7.3 Provision of Ramp for Divyangajan:

The Institute has made provision of Ramp for easy movement of Divyangajan.

Photograph of Ramp:



7.4 Creation of Awareness on Water Conservation:

The Institute has displayed Posters on Importance of Water Conservation.

Photograph of Poster on importance of Water Conservation:



7.5 Tree Plantation in the Campus:

On 19th March 2022, the Institute organized Tree Plantation Event in the Campus.

Photograph of Tree Plantation Program:

