



Since 1994

Marathwada MitraMandal's
INSTITUTE OF MANAGEMENT EDUCATION RESEARCH AND TRAINING
(IMERT), Pune

**S. No. 18, Plot No. 5/3, CTS No. 205, Behind Vandevi Temple, Karvenagar,
Pune – 411052**



Green Campus Initiatives and Sustainability Policy



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Pune – 411052



7.1.2 Green Campus Initiatives and Sustainability Policy

Introduction:

MM's IMERT acknowledges the critical importance of sustainability across its operations. In line with our dedication to environmental consciousness and ethical responsibility, we are dedicated to cultivating a green campus with sustainable practices. Our aim is to promote ecological equilibrium, enhance resource efficiency, and cultivate environmental awareness among all. This policy states the objectives, strategies and guidelines to achieve a sustainable campus.

Objectives:

MM's IMERT Green Campus Policy outlines several key objectives to advance sustainability efforts:

1. **Reduce Carbon Footprint:** MM's IMERT aims to significantly reduce greenhouse gas emissions across campus operations through energy efficiency measures, adoption of renewable energy sources, and encouraging use of e vehicles etc. Initiatives include the installation of LED lights and use of alternate energy sources.
2. **Conserve Natural Resources:** MM's IMERT is committed to conserving water and energy resources through efforts such as rainwater harvesting. The Institute also has ample tree cover and landscaped garden to enhance its green cover.
3. **Plastic Usage and Waste management:** IMERT is committed to reduce usage of plastic. It strives to minimize waste generation, increase recycling rates, and implement responsible waste management practices. The Institute aims to handle waste disposal in a proper manner
4. **Preserve Biodiversity:** The institution focuses on preserving and enhancing biodiversity on campus by protecting natural habitats, supporting native flora and fauna, and employing landscaping practices that are sensitive to ecological needs.
5. **Educate and Engage:** MM's IMERT endeavors to educate and engage students, faculty, staff, and visitors on environmental issues, sustainable practices, and the importance of collective action for a sustainable future.



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Sustained efforts: MM's IMERT commits to regularly monitoring and evaluating its sustainability performance, setting targets for improvement, and adjusting strategies in response to evolving environmental challenges and opportunities.

These objectives underscore MM's IMERT dedication to fostering a sustainable campus environment while promoting environmental stewardship and community involvement.

Initiatives:

To achieve its objectives, the Institute will implement the following strategies:

1. **Reduce Carbon Footprint:** IMERT in association with Climekare Sustainability Private Limited carried out the carbon audit for the year 2023 and got a Carbon Footprint done for its institute. IMERT is a pioneer organisation in India to get a Carbon Offset Certificate. The institute also uses Digital Signature for various document authorisation purposes.
2. **Efficient use of energy:** IMERT will deploy energy-efficient technologies and promote conservation practices campus-wide. LED lights have been installed across colleges to reduce energy consumption and greenhouse gas emissions.
3. **Alternative Energy:** IMERT is investing in renewable sources like solar energy, to diversify the energy portfolio and move towards a carbon-neutral campus. Solar water heaters are installed on the hostel roof to achieve the objective.
4. **Use of E-vehicles:** The Institute encourages the use of sustainable transportation options such as e-vehicles or use of public transport. The use of electric vehicles by college management promotes sustainable practices, with plans to improve supporting infrastructure.
5. **Water Conservation:** IMERT has a rainwater harvesting system in place. This system channels rain water into the borewells thereby increasing the groundwater availability and level.
6. **Waste Reduction and Recycling:** The college initiates waste reduction programs, enhances recycling infrastructure, and educates the community on effective waste separation and recycling practices. Opportunities for composting organic waste are also explored. For honouring guests, the institute gives various types of plants in ceramic pots; instead of plastic pots, in keeping with its objective of reducing plastic usage.



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7. **Biodiversity Conservation:** IMERT has great biodiversity in place. It has formed a Green Cell which aims to conserve the same and promote environmental activities like tree plantation.

8. **Memorandum of Understandings (MOUs):** IMERT has various MOU's in place for the scientific disposal of non- biodegradable waste. These collaborations aim to advance regional sustainability goals effectively.

By implementing these strategies, IMERT aims to achieve its sustainability objectives comprehensively, contributing to environmental leadership and community engagement.

CARBON OFFSET CERTIFICATE

This certificate represents the avoidance of 480 tones of CO₂ emissions equivalent from the atmosphere. Presented to

MMCOE & IMERT, Pune, Maharashtra,

for the retirement of 480 Carbon Offset Units (CoUs).

Title of Project: **2.0 MW Solar Grid Power Project** by VSESPL,
Chittoor, Andhra Pradesh

Type of Project - **Energy Industries (Renewable Sources)**

Retired Serial Numbers Range:

0001-000021-000263-UCR-CoU-IN-325-31032017-31122017

0001-000264-000500-UCR-CoU-IN-325-31032017-31122017

Retirement Date: 07/02/2024, Standard & Registry: Universal Carbon Registry
(ucarbonregistry.io) UCR Project ID: 325, Vintage Year: 2017



Sneha Kumari
Chief Sustainability Officer
Climekare Sustainability Pvt. Ltd.



Climekare



UCR
Universal Carbon Registry

Carbon Footprint Report For MMCOE & IMERT College Campus



About Climekare Sustainability Pvt. Ltd. –

At ClimeKare Sustainability Pvt. Ltd., we are committed to helping organizations achieve their sustainability goals. We provide comprehensive services related to climate change mitigation, including carbon footprint accounting, carbon neutral advisory, ESG reporting, and CSR for climate change mitigation. Our experts understand the complex regulations and policies related to carbon Emissions and will help you develop a plan to meet your emissions targets.

Our mission is to help organizations reduce their carbon footprint and achieve their sustainability goals. We strive to provide comprehensive services to enable our clients to develop a comprehensive strategy for climate change mitigation.

Our vision is to create a future where organizations are able to reduce their environmental impact and contribute to the global effort to mitigate climate change. We believe that companies should be held accountable for their carbon emissions and have a responsibility to develop sustainable solutions. We are committed to helping our clients reduce their carbon footprint and create a more sustainable future.

About this Report -

This report provides a detailed greenhouse gas emissions arising in June 2022 to May 2023 at MMCOE & IMERT College Campus. The report content brief Information about Scope I, Scope II & Scope III calculation of emission & Mitigation to MMCOE & IMERT College Campus.

It has been prepared following a review of internal and external documentation, questionnaires with coordinator and interrogation of source data and data collection systems. All data collected and analysed within this report follow the World Resources Institute GHG Protocol principles of relevance, completeness, consistency, transparency and accuracy.

Objective of this Report –

Calculate the Carbon footprint emission of Institute and suggest the mitigation to make carbon neutral.

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Abbreviations –

MMCOE - MARATHWADA MITRA MANDAL'S COLLEGE OF ENGINEERING

IMERT - INSTITUTE OF MANAGEMENT EDUCATION RESEARCH AND TRAININ

GHG – GREENHOUSE GAS

RCP - REPRESENTATIVE CONCENTRATION PATHWAY

LPG - LIQUEFIED PETROLEUM GAS

Kwh – KILOWATT HOUR

IPCC - INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

CO_{2e} – CARBON DIOXIDE EQUIVALENT

FMCI^{III} - FOUNDATION FOR MAKE IT HAPPEN CENTER FOR INVENTION
INNOVATION INCUBATION

Introduction ...

We have eight planets in our solar system, each one circling the sun at a different distance. Earth is the third planet and we are in what is called the ‘Goldilocks Zone’. That means we aren’t too hot and we aren’t too cold; we are just right. This has allowed life to thrive on earth because the temperature is perfect enough to allow liquid water, which is believed to be one of the key elements to have life on a planet. Venus has what is called a runaway greenhouse effect. It’s a never ending cycle of heat being trapped inside due to the rising carbon dioxide levels. This is what happens when an atmosphere absorbs too much carbon dioxide: the heat has nowhere to go. As the temperature rises it effects the entire planet, creeping deep into the depths of the core.

Greenhouse gases (GHGs) are gases that increase the temperature of the Earth due to their absorption of infrared radiation. Although some emissions are natural, the rate of which they are being produced has increased because of humans. These gases are emitted from fossil fuel usage in electricity, in heat and transportation, as well as being emitted as by product of manufacturing. The most common GHGs are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and many fluorinated gases. A greenhouse gas footprint is the numerical quantity of these gases that a single entity emits. The calculations can be computed ranging from a single person to the entire world. The latest climate science is published in the IPCC Sixth Assessment Report. The report presents key scientific findings linking the increase in anthropogenic GHGs emissions in current climate change. According to the report, it is only possible to avoid warming of 1.5 °C or 2 °C if massive and immediate cuts in greenhouse gas emissions are made. Intergovernmental Panel on Climate Change (IPCC) – Assessment Report 6

- In next 20 years, global temperature is expected to reach or exceed 1.5°C of warming
 - Strong and sustained efforts are required.
 - To achieve “Net Zero” by mid of the century - To avoid catastrophic effects
-
- ❑ UNFCCC global target to achieve Zero Emission by 2050
 - ❑ Globally, Businesses have set 2050 as target year for Net-Zero

Global warming is currently one of the most important concerns confronting the international community at the local, national, and global levels. The most immediate and visible effect of global warming is an increase in global temperatures. The global averaged combined land and ocean surface temperature has risen by 0.85 °C over the last 130 years (1880-2012) and is expected to climb further. The increase in global mean surface temperature is expected to be 0.3°C to 1.7°C under RCP 2.6, 1.1°C to 2.6°C under RCP4.5, 1.4°C to 3.1°C under RCP 6.0 and 2.6°C to 4.8°C under RCP 8.5 by the end of the 21st century as compared to 1986-2005. Increasing greenhouse gas emissions is one of the primary causes of global warming. According to the different climate models, it was projected that earth surface temperatures will increase in the range of 1.6 up to 5.8°C by end of this century in line with current rates of population growth and GHG emissions .

Carbon footprint has become a widely used concept in general public on responsibility and abatement action against global warming over the last few years. It can be defined as a measurement of the total GHG emissions caused directly and indirectly by an individual, an organization, event or product and is expressed as a carbon dioxide equivalent (CO₂e).

An organizational carbon footprint measures the GHG emissions from all the activities across the organization, including energy used in buildings, LPG use in kitchen and student and staff commuting etc. calculating an organization's carbon footprint can be an effective tool for ongoing energy and environmental management.

Methodology for Calculations...

The carbon footprint measures the impact on the planet in terms of how many greenhouse gas emissions we emit directly or indirectly in our daily activities as an organisation.

Study Area –

Area - MMCOE & IMERT College Campus.

Geographical Coordinates - 18°29'25"N Logitude, 73°48'33"E latitude

Address - Sr.No.18, Plot No.5/3, CTS No.205,

Behind Vandevi Temple, Karve Nagar, Pune,

Maharashtra 411052

Table 2.1 Name of the Departments

Computer Engineering	Mechanical Engineering
E & TC Engineering	Electrical Engineering
Information Technology	Engineering Science
Artificial Intelligence & data Science	IMERT - MBA
FMCI	

Assessment of Carbon Footprint –

Carbon Footprint of an MMCOE & IMERT college Campus has been assessed using four basic steps, by setting the organizational boundary, setting operational boundary and collection of data and finally calculation of emissions using appropriate emissions factors.

The emissions inventory includes emissions generated by the activity at the organisational level, such as emissions generated directly and indirectly by the use of the offices. In terms of the activities carried out for the implementation of projects, only the emissions generated by

associated work-related travel are included, both through vehicles managed by the organisation and other means of transport.

In the following table the GHG emissions identified to calculate the carbon footprint are presented, which are classified in three scopes,

Table 2.2 Emission Activities

Emission Activities			
Scope	Category	Emission Activities	Activity data
Scope I	Direct Emission	LPG use In canteen & mess	Gas in Kg
Scope II	Indirect Emission	Electricity consumption	kWh of electricity purchase
Scope III	Other Indirect Emission	goods and services used by the organisation ,	Origin and destination of the travel and type of transport used
		Student and staff Commuting	Survey Regarding Travelling
		Waste Generation in Organization	Transport Details
		Business Travel	Transport Details

Data Collections –

Two types of data were collected namely activity data and Emission Factors. Since sampling is not carried out for this kind of study, activity data were collected from all activities within the defined boundaries for one-year period (June 2022- May 2023). Specially, commuting data were collected from all employees of the office as well. Parameters and relevant sources of the activity data related to each and every operations.

Table 2.3 Data Collection

Aspects	Parameters of Activity Data	Sources
LPG - on site	LPG consumption Annually (kg)	Invoices
Electricity – on site	Electricity consumption Annually (kWh)	Electricity Bills

Commuting	Distance traveled annually (km) -Average fuel efficiency of Vehicles -Type of vehicle -No of days per week traveled -No of weeks per year worked in the office -Type of fuel -Average No. of persons	questionnaire
Waste Disposal	Amount of food waste generation annually Amount of waste generation in daily routine	questionnaire
Purchase goods & Services Transportation	Distance traveled	Purchase Book
Business Travel	Distance traveled	questionnaire

Emission Factors have been developed with the use of **2006 IPCC Guidelines for National Greenhouse Gas Inventories**, which can be used to the derivation of Emission Factors for any activity at any place in the world.

Table 2.4 Emission Factors

Activity	Emission Factors
LPG	2.98 kg/kg
Electricity	0.79 kg/kWh
Petrol	2.27 kg/lit
Diesel	2.64 kg/lit

Formula For Calculation –

Carbon Footprint of each emission sources and activities were calculated in kg CO₂e/year by multiplying activity data with Emission Factor.

$$\text{Carbon Footprint (CO}_2\text{e)} = \text{Activity Data} * \text{Emission Factor}$$

Result & Analysis...

Results of the June 2022 to June 2023 Carbon Footprint –

The results of the carbon footprint calculation for June 2022 to May 2023 by scope are detailed below:

Table 3.1 Carbon Emission by Scope I for June 2022 to May 2023

SCOPE I CARBON EMISSION - MMCOE & IMERT							
MONTH	YEAR	FMCIII Canteen		Carbon Emission (2.98 kg/kg)	MMCOE Canteen & mess		Emission (2.98 kg/kg)
		No of Cylinder	19 kg gas/cylinder		No. of Cylinder	19 Kg gas/Cylinder	
JUNE	2022	3	57	169.86	85	1615	4812.7
JULY	2022	3	57	169.86	90	1710	5095.8
AUGUST	2022	3	57	169.86	88	1672	4982.56
SEPTEMBER	2022	3	57	169.86	90	1710	5095.8
OCTOBER	2022	2	38	113.24	70	1330	3963.4
NOVEMBER	2022	2	38	113.24	70	1330	3963.4
DECEMBER	2022	3	57	169.86	90	1710	5095.8
JANUARY	2023	3	57	169.86	95	1805	5378.9
FEBRUARY	2023	3	57	169.86	90	1710	5095.8
MARCH	2023	3	57	169.86	90	1710	5095.8
APRIL	2023	3	57	169.86	95	1805	5378.9
MAY	2023	3	57	169.86	95	1805	5378.9
Total (kg)		34	646	1925.08	1048	19912	59337.76
Total (ton)				1.92508			59.33776
Total Co2 emission (ton)				61.26284			

Scope I is related to fuel which is use under the campus premises. It included FMCIII canteen & MMCOE canteen or mess. By **FMCIII canteen** carbon emission is **1.92508 ton** & by **MMCOE canteen or Mess** is **59.33776 ton**. The total carbon emission of **scope I** is **61.26284 ton**.

Table 3.2 Carbon Emission by Scope II for June 2022 to May 2023

SCOPE II CARBON EMISSION - MMCOE & IMERT				
MONTH	YEAR	UNITS	CARBON EMISSION (0.79kg/kWh)	Carbon Avoided by Solar Water Heater (kg)
JUNE	2022	30421	24032.59	13272
JULY	2022	25674	20282.46	
AUGUST	2022	20683	16339.57	
SEPTEMBER	2022	26344	20811.76	
OCTOBER	2022	21382	16891.78	
NOVEMBER	2022	27745	21918.55	
DECEMBER	2022	30034	23726.86	
JANUARY	2023	28703	22675.37	
FEBRUARY	2023	29018	22924.22	
MARCH	2023	35792	28275.68	
APRIL	2023	37781	29846.99	
MAY	2023	49843	39375.97	
Total (kg)		363420	287101.8	13272
Total (ton)			287.1018	13.272
Total CO2 emission			273.8298	
Total CO2 Avoided in %			4.418494556	

Scope II is related to indirect emission which emit by purchase electricity. The carbon emission by electricity is **287.1018 ton**. There is a solar water heater for heating water for the hostel, which help to reduce the use of electricity. It help to reduced **13.272** ton which is about **4.41%** reduction.

Table 3.3 Carbon Emission by Scope III for June 2022 to May 2023

Scope III CARBON EMISSION - MMCOE & IMERT From June 2022 to May 2023	
Category	Carbon Emission (ton CO ₂ e/yr)
Category 1 - Purchased Goods & Services	0.31152
Category 5 - Waste Generation	3.37656
Category 6 - Business travelled	0.1598307
Category 7 - Student, staff & FMCIII employee Commuting	137.12334
Total (ton CO₂e /yr)	140.9712507

Scope III is related to other indirect emissions which included the different 15 categories but as a discussion four categories are applicable to this campus which are mention as above. The total Scope III carbon emission is 140.971 ton.

Table 3.3 Total Carbon Emission

TOTAL CARBON EMISSION FOR MMCOE & IMERT FROM JUNE 2022 TO MAY 2023	
Scope I	61.26284
Scope II	273.8298
Scope III	140.9712
Total CO₂e in ton	476.06384

Total Carbon Footprint of the campus is 476.06384 t CO₂-e for the June 2022 – May 2023. Electricity is the main factor that most affected to carbon footprint. It accounts 57.51% of the total. Indirect GHG emissions show the highest value, than direct emissions. The Direct emission is only 12.61 % & other indirect carbon emission is about 29.61%.

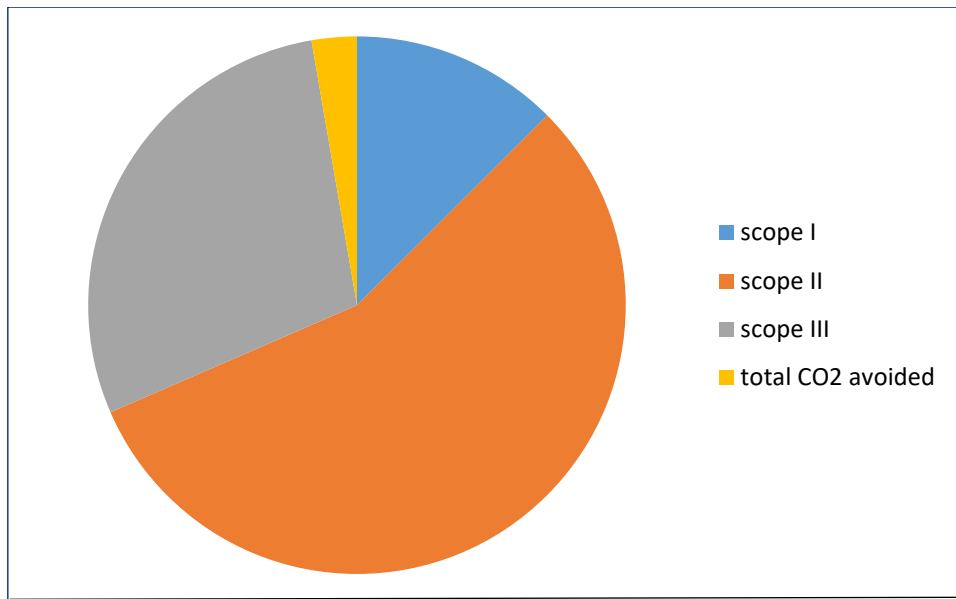


Image - Pie Chart for Carbon emission

METHODS USED TO REDUCE AND OFFSET CARBON FOOTPRINT IN THE CAMPUS –

INSTALLATION OF ROOF TOP SOLAR –

By using rooftop solar energy systems, users can significantly reduce their carbon emissions. Solar power does not produce greenhouse gases or other pollutants after installation.

Suggestion – As per the MMCOE can undergo solar power plant as per the load sanction capacity of 170 kw (reference – electricity bill June 2023 meter no- 055-X1096527) this will offset about 300 CoU .

USING BIO FUELS FOR TRANSPORTATION

Bio diesel can be used in any diesel powered vehicle, it is biodegradable and non-toxic. Bio Diesel is a helps to reduce CFP as it only releases CO₂ that the plants absorbed whilst Growing; therefore there is no negative impact on the carbon cycle.

Bio diesel which is used in Faculty owned two wheel tractors, has produced from the plant oil Extracted from the Jatropha oil, palm oil and used scraped coconut with transesterification Process within the Faculty. It was found that, the emission of CO from engine exhaust is 45% less than mineral diesel. Therefore it contributes to reduce present and future total CFP in the Faculty. Some researchers are being conducted to produce bio fuels from Algae in the Faculty also.

PUBLIC AWARENESS

The most suitable way to reduce Carbon Footprint is adapting of zero cost activities. People may be aware of those activities through posters. There are some posters used to make student and staff aware such as Turn light off when offices and meeting rooms are empty, ensure electric equipment is off When not in use, and dispose the waste separately in the Faculty.

PLANTATION –

Carbon Sequestration by tree plantation (Silver Maple, Oak, Dogwood, Pine, Neem)

WASTE MANAGEMENT

Students and all staff members are encouraged for segregating waste at the point of origin in the Faculty. Three containers have been established at every building to dispose the waste Separately. It helps to prevent of mixing of recyclable waste with biodegradable waste.

REFERENCES –

- 1) IPCC guidelines for national greenhouse gas inventories, 2006. volume i, ii, iii, iv, v
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- 4) biogas purification and bottling into cng cylinders: producing bio-cng from biomass for rural automotive applications virendra k. vijay1,*, ram chandra1 , parchuri m. v. subbarao2 and shyam s. kapdi3
- 5) the united nations intergovernmental panel on climate change. climate change 2007. synthesis report [r]. ipcc, geneva, switzerland, 2007, 10.
- 6) greenhouse gas assessment handbook, 2008. a practical guidance document for the assessment of project level greenhouse gas emissions .
- 7) carbon footprint of an organization: a case study, faculty of agriculture, university of ruhunam.g.g. awanthi and c.m.navaratne

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Mukhtangan English School,
Parvati, Pune 411 009 Tel: 09890444795 Email: engress123@gmail.com
MEDA Registration No: ECN/2022-23/CR-43/1709
ISO: 9001-2015 Certified (Cert No: 23EQKC13),
ISO: 14001-2015 Certified (Cert No: 23EEKW20)

ENVIRONMENTAL AUDIT CERTIFICATE

Certificate No: ES/MMMIMERT /22-23/03

Date: 18/4/2023

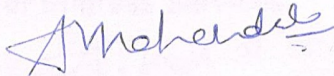
This is to certify that we have conducted Environmental Audit at Marathwada Mitra Mandal's Institute of Management Education Research & Training, Karvenagar, Pune, in the Academic year 2022-23.

The Institute has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Light Fitting
- Usage of BEE STAR Rated Energy Efficient Equipment
- Maximum Usage of Day Lighting
- Installation of Solar Thermal Water Heating System at Hostel block
- Segregation of Waste at source
- Installation of Bio Composting Unit for conversion of Organic Waste
- Provision of Sanitary Waste Incinerator, for disposal of Sanitary Waste
- Installation of Rain Water Harvesting Project
- Tree Plantation in the campus
- Creation of awareness on Resource Conservation by display of posters

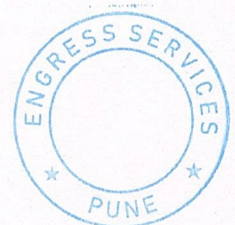
We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Eco Friendly.

For Engress Services,



A Y Mehendale,

B E- Mech, M Tech-Energy, Certified Energy Auditor, EA-8192
ASSOCHAM GEM Certified Professional: GEM: 22/788



ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune 411 009

Tel: 09890444795 Email: engress123@gmail.com

MEDA Registration No: ECN/2022-23/CR-43/1709

ISO: 9001-2015 Certified (Cert No: 23EQKC13),

ISO: 14001-2015 Certified (Cert No: 23EEKW20)

ENERGY AUDIT CERTIFICATE

Certificate No: ES/MMMIMERT/22-23/01

Date: 18/4/2023

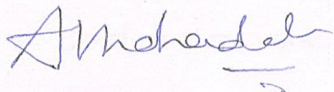
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The Institute has adopted following Energy Efficient Practices:

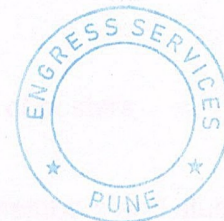
- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of Solar Thermal Water Heating System at Hostel block

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient.

For Engress Services,



A Y Mehendale,
B E-Mechanical, M Tech- Energy
BEE Certified Energy Auditor, EA-8192



Natural Infocom And Engineers Pvt. Ltd.



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Pune-411026

Contact No. 9158214594

Website: www.niceled.in

Ref No: NICE/MMIMERT/14

Date: 10/06/2022

Energy and Green Audit: Summary

1. Name of the Client: Marathwada Mitra Mandal's Institute of Management Education Research and Training, Karvenagar, Pune.
2. Form of Usage of Energy: Electrical Energy and LPG
3. Important Parameters: Electrical Energy Usage:

No	Parameter	Max	Min	Average
1	Units Consumed, kWh	7078	1478	3033
2	Max Demand, kVA	19.98	14.19	16.75

4. Floor wise Calculation of Energy Consumption

6th Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	Director's Office	Led Lights	8	8
2		Fans	1	5
3		A/c	2	6
4	CRD Room	Fans	6	8
5		Led Lights	17	8
6	Board Room	A/c	2	4
7		Led Lights	6	5
8	Pantry	Led Lights	2	6
9		Fans	1	6

Natural Infocom And Engineers Pvt. Ltd.



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CIN No.: U72400PN2009PTC133897 • GSTIN : 27AADCN0033A1Z9



10	Exam Control Room	Led Lights	5	6
11		Fans	2	8
12	Faculty Room	Led Lights	10	8
13		Fans	6	8
14	Corridor	Led Lights	10	4
15	Washroom	Led Lights	4	4

5th Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	NACC Office	Led Tube Lights	2	6
2		Fans	2	5
3	Account Office	Fans	4	8
4		Led Tube Lights	6	8
5	Library	Fans	8	8
6		Led Tube Lights	14	4
7	Class Room	Fans	2	6
8		Led Tube Lights	4	6
9	Corridor	Led Tube Lights	10	4
10	Washroom	Led Tube Lights	4	4

4th Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	Tutorial Room	Led Tube Lights	4	6
2		Fans	2	5
3	OIA	Fans	2	6
4		Led Tube Lights	2	6
5	Class Room 5	Fans	4	8
6		Led Tube Lights	6	4
7	OIA	Fans	2	6
8		Led Tube Lights	2	6
9	Computer Room	Fans	14	5

Natural Infocom And Engineers Pvt. Ltd.



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10		Led Lights	15	4
11		Computers	60	3
12	Corridor	Led Tube Lights	10	4
13	Washroom	Led Tube Lights	4	4

3rd Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	Faculty Room	Led Tube Lights	2	6
2		Fans	2	7
3	Seminar Hall	Fans	14	5
4		Led Lights	17	5
5	Corridor	Led Tube Lights	10	4
6	Washroom	Led Tube Lights	4	4

2nd Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	Faculty Room	Led Tube Lights	4	8
2		Fans	2	8
3	Class Room 1	Fans	4	7
4		Led Tube Lights	4	7
5	Class Room 2	Fans	4	7
6		Led Tube Lights	6	7
7	Class Room 3	Fans	4	7
8		Led Tube Lights	4	7
9	Girls Room	Fans	4	7
10		Led Tube Lights	4	7
11	Corridor	Led Tube Lights	10	4
12	Washroom	Led Tube Lights	4	4

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1st Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	First Aid Room	Led Tube Lights	2	2
2		Fans	2	2
3	Central Room	Fans	2	7
4		Led Tube Lights	4	7
5	Cafeteria	Fans	4	7
6		Led Tube Lights	8	7
7	Class Room	Fans	4	7
8		Led Tube Lights	6	7
9	Girls Room	Fans	4	7
10	Corridor	Led Tube Lights	10	4
11	Washroom	Led Tube Lights	4	4

Ground Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	Premises	Led Tube Lights	11	12
2		Fans	7	18
3	Washroom	Led Tube Lights	4	4
4	Lift	Lift	1	14

5. Findings

- Marathwada Mitra Mandal's Institute of Management Education Research and Training at the time of inception took in consideration the recommendations of the Audit Report dated 10/06/2022, resulting in shifting from Conventional CFL Tube lights to Led Lights and Tubes.
- Average Monthly consumption of Units as per average of year is 3033 Units.
- Average Monthly bill payment is 47460 rupees.
- Average Monthly Unit Rate is 16.75 rupees per unit.

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6. Recommendations

Sir No	Recommendations
1.	Common Street lights to be shifted into Solar Paneled Lights.
2.	Installation of Photovoltaic Solar System On- grid of 24 KW. Generation through solar PV Panels would be approximately 3000 Units/ Month.
3.	Area required for installation of 24 KW system will be 1680 Sqft.
4.	Additional Benefits of Solar PV Installation: - Government subsidy of rupees 13400/KW. - Saving of 5% on Property Tax every Year. - The Payback period of the installation is only 3 Years whereas the system has the life of more than 30 Years. - Options available for Installations are Bank Loans, BOT, Opex, Capex, etc.
5.	Area required for installation of 24 KW system will be 1680 Sqft.
6.	Estimated Monitory savings by installation of Solar PV would be around - - Rs 47460 Monthly and Rs 569520 per Year.

For Natural Info Com and Engineers Pvt. Ltd.




Mr. Rakesh Bajoria
(Chief Executive Officer)

Natural Infocom And Engineers Pvt. Ltd.



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Natural Info Com and Engineers Pvt. Ltd.

Plot No. 58, Sec No. 7

MIDC Bhosari

Pune-411026

Contact No. 9158214594

Website: www.niceled.in

Ref No: NICE/MMIMERT/14

Date: 04/06/2021

Energy and Green Audit: Summary

1. Name of the Client: Marathwada Mitra Mandal's Institute of Management Education Research and Training, Karvenagar, Pune.
2. Form of Usage of Energy: Electrical Energy and LPG
3. Important Parameters: Electrical Energy Usage:

No	Parameter	Max	Min	Average
1	Units Consumed, kWh	3394	1133	2097
2	Max Demand, kVA	20.4	18.8	19.06

4. Floor wise Calculation of Energy Consumption

6th Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	Director's Office	Led Lights	8	8
2		Fans	1	5
3		A/c	2	6
4	CRD Room	Fans	6	8
5		Led Lights	17	8
6	Board Room	A/c	2	4
7		Led Lights	6	5
8	Pantry	Led Lights	2	6
9		Fans	1	6

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10	Exam Control Room	Led Lights	5	6
11		Fans	2	8
12	Faculty Room	Led Lights	10	8
13		Fans	6	8
14	Corridor	Led Lights	10	4
15	Washroom	Led Lights	4	4

5th Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	NACC Office	Led Tube Lights	2	6
2		Fans	2	5
3	Account Office	Fans	4	8
4		Led Tube Lights	6	8
5	Library	Fans	8	8
6		Led Tube Lights	14	4
7	Class Room	Fans	2	6
8		Led Tube Lights	4	6
9	Corridor	Led Tube Lights	10	4
10	Washroom	Led Tube Lights	4	4

4th Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	Tutorial Room	Led Tube Lights	4	6
2		Fans	2	5
3	OIA	Fans	2	6
4		Led Tube Lights	2	6
5	Class Room 5	Fans	4	8
6		Led Tube Lights	6	4
7	OIA	Fans	2	6
8		Led Tube Lights	2	6
9	Computer Room	Fans	14	5

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11		Computers	60	3
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3rd Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	Faculty Room	Led Tube Lights	2	6
2		Fans	2	7
3	Seminar Hall	Fans	14	5
4		Led Lights	17	5
5	Corridor	Led Tube Lights	10	4
6	Washroom	Led Tube Lights	4	4

2nd Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	Faculty Room	Led Tube Lights	4	8
2		Fans	2	8
3	Class Room 1	Fans	4	7
4		Led Tube Lights	4	7
5	Class Room 2	Fans	4	7
6		Led Tube Lights	6	7
7	Class Room 3	Fans	4	7
8		Led Tube Lights	4	7
9	Girls Room	Fans	4	7
10		Led Tube Lights	4	7
11	Corridor	Led Tube Lights	10	4
12	Washroom	Led Tube Lights	4	4

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1st Floor

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2		Fans	2	2
3	Central Room	Fans	2	7
4		Led Tube Lights	4	7
5	Cafeteria	Fans	4	7
6		Led Tube Lights	8	7
7	Class Room	Fans	4	7
8		Led Tube Lights	6	7
9	Girls Room	Fans	4	7
10	Corridor	Led Tube Lights	10	4
11	Washroom	Led Tube Lights	4	4

Ground Floor

Sir No	Premises Type	Electrical Appliance	Present Quantity	Usage Hours
1	Premises	Led Tube Lights	11	12
2		Fans	7	18
3	Washroom	Led Tube Lights	4	4
4	Lift	Lift	1	14

5. Findings

- Marathwada Mitra Mandal's Institute of Management Education Research and Training at the time of inception took in consideration the recommendations of the Audit Report dated 04/06/2021, resulting in shifting from Conventional CFL Tube lights to Led Lights and Tubes.
- Average Monthly consumption of Units as per average of year is 2097.25 Units.
- Average Monthly bill payment is 35153 rupees.
- Average Monthly Unit Rate is 16.76 rupees per unit.

Natural Infocom And Engineers Pvt. Ltd.



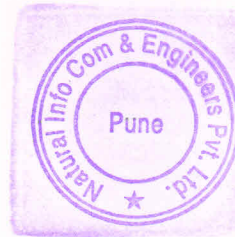
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6. Recommendations

Sir No	Recommendations
1.	Common Street lights to be shifted into Solar Paneled Lights.
2.	Installation of Photovoltaic Solar System On- grid of 16.778 KW. Generation through solar PV Panels would be approximately 2097.25 Units/ Month.
3.	Area required for installation of 16.778 KW system will be 1174 Sqft.
4.	Additional Benefits of Solar PV Installation: - Government subsidy of rupees 13400/KW. - Saving of 5% on Property Tax every Year. - The Payback period of the installation is only 3 Years whereas the system has the life of more than 30 Years. - Options available for Installations are Bank Loans, BOT, Opex, Capex, etc.
5.	Area required for installation of 16.778 KW system will be 1174 Sqft.
6.	Estimated Monitory savings by installation of Solar PV would be around - - Rs 35153 Monthly and Rs 421842 per Year.

For Natural Info Com and Engineers Pvt. Ltd.



Mr. Rakesh Bajoria
(Chief Executive Officer)