



## DR. J. J. MAGDUM TRUST'S

7.1.6 The Institutional environment and energy initiatives are confirmed through the Green audit, Energy audit, Environment audit, Clean & green campus recognitions/awards, Beyond the campus environmental promotional activities during the year 2022-23.

Sr.No.	Description	Link
01	<p>Quality audits on environment and energy regularly undertaken by the Institution.</p> <p>The institutional environment and energy initiatives are confirmed through the following</p> <ol style="list-style-type: none"><li>1. Green audit 2022-23</li><li>2. Energy audit 2022-23</li><li>3. Environment audit 2022-23</li><li>4. Beyond the campus environmental promotion activities</li></ol>	

*Jh.*



B:\DAN FNAAC\2021-22-criteria7\AQAR22 23\Nkam Madam 15.11.2023.docx

**Dr. J. J. Magdum College of Engineering, Jaysingpur**

Approved by A.I.C.T.E, New Delhi  Recognized by Govt. of Maharashtra (D.T.E.)  Affiliated to SHIVAJI UNIVERSITY, Kolhapur

Gat No. 289 (314/330), Shirol-Wadi Road, (Agarbhag), JAYSINGPUR - 416 101. Dist. Kolhapur (M.S.)  
Tel. No. (02322) 221825, 221123, Fax No.: (02322) 221831



Dr. J. J. Magdum Trust's  
**Dr. J. J. Magdum College of Engineering,  
Jaysingpur.**

# **Green Audit 2022-23**



# GREEN AUDIT REPORT

of

Dr. J. J. Magdum Trust's,  
**DR. J. J. MAGDUM COLLEGE OF ENGINEERING,**  
Jaysingpur, 416 101



Year: 2022-23



Prepared by:

## **ENGRESS SERVICES**

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



## INDEX

Sr. No	Particulars	Page No
I	Acknowledgement	5
II	Executive Summary	6
III	Abbreviations	7
1	Introduction	8
2	Study of Energy Consumption & CO <sub>2</sub> Emission	9
3	Study of Usage of Renewable Energy	10
4	Study of Waste Management	11
5	Study of Water Conservation & Rain water Management	13
6	Study of Green & Sustainable Practices	14
	<b>Annexure</b>	
I	List of Trees & Plants	16



## ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Dr. J. J. Magdum Trust's Dr. J. J. Magdum College of Engineering Jaysingpur, 416 101, for awarding us the assignment of Green Audit of their Campus for the Year: 2022-23.

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



## EXECUTIVE SUMMARY

1. Dr. J. J. Magdum Trust's Dr. J. J. Magdum College of Engineering Jaysingpur uses Energy in the form of **Electrical Energy**; used for various Electrical Equipment.

### 2. Present Energy Consumption & CO<sub>2</sub> Emission:

No	Particulars	Value	Unit
1	Annual Energy Consumed	105329	kWh
2	Annual CO <sub>2</sub> Emissions	94.80	MT

### 3. Usage of Renewable Energy:

- Installation of Solar Thermal Water Heating System at the Hostel block.
- Installation of Solar Street Lights

### 4. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Organic Waste	Installed Bio- tumbler Unit
3	Food Waste	In process installation of Bio Gas plant
4	E Waste	Disposed of through Authorized Agency

### 5. Water Conservation & Rain Water Management:

The rain water falling on the terrace is channelized through pipes and is used for recharging the bore well as well as stored in a Water Tank, which is further used for watering the Trees and Plants.

### 6. Green & Sustainable Practices:

- Maintenance of good Internal Road
- Tree Plantation in the campus.
- Provision of Ramp for Divyangajan
- Creation of awareness on Energy Conservation Display of Posters



### 7. Assumption:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO<sub>2</sub> into atmosphere

### 8. Reference:

- For CO<sub>2</sub> Emissions: [www.tatapower.com](http://www.tatapower.com)



## ABBREVIATIONS

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

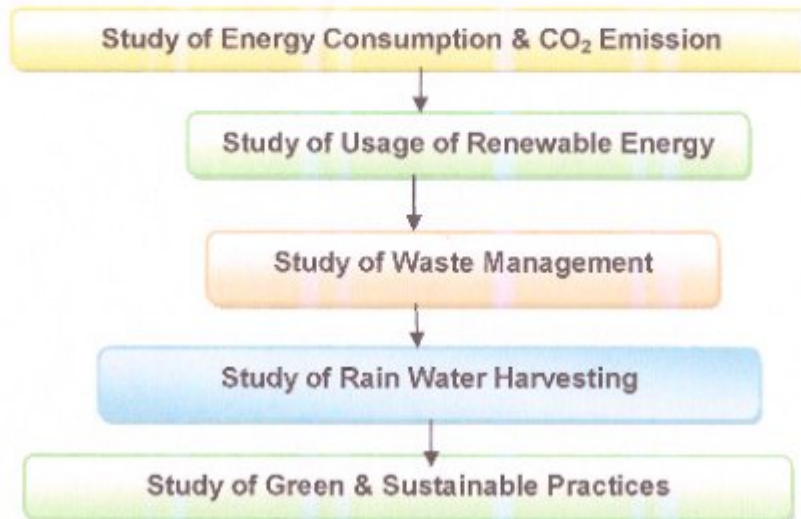


## CHAPTER-I INTRODUCTION

### 1.1 Introduction:

A Green Audit is conducted at Dr. J. J. Magdum Trust's Dr. J. J. Magdum College of Engineering Jaysingpur,

### 1.2 Audit Procedural Steps:



### 1.3 Institute Location Image:



College  
Campus



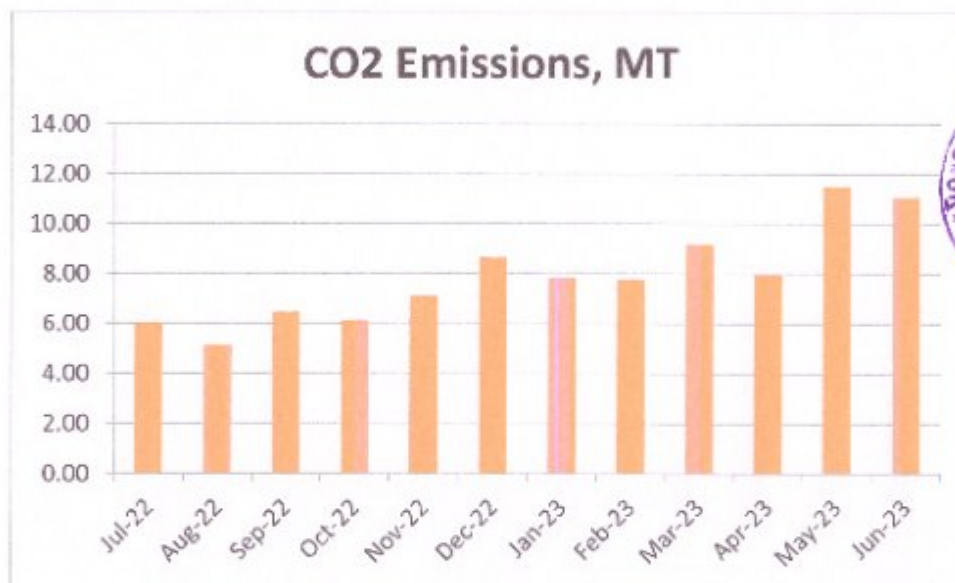
## CHAPTER-II STUDY OF ENERGY CONSUMPTION & CO<sub>2</sub> EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. Basis for computation of CO<sub>2</sub> Emissions: 1 kWh of Electrical Energy releases 0.9 Kg of CO<sub>2</sub> into atmosphere.

Table No 1: Month wise Energy Consumption & CO<sub>2</sub> Emissions:

No	Month	Energy Consumed, kWh	CO2 Emissions, MT
1	Jul-22	6681	6.01
2	Aug-22	5713	5.14
3	Sep-22	7188	6.47
4	Oct-22	6819	6.14
5	Nov-22	7919	7.13
6	Dec-22	9616	8.65
7	Jan-23	8732	7.86
8	Feb-23	8606	7.75
9	Mar-23	10196	9.18
10	Apr-23	8840	7.96
11	May-23	12730	11.46
12	Jun-23	12289	11.06
13	Total	105329	94.80
14	Maximum	12730	11.46
15	Minimum	5713	5.14
16	Average	8777.42	7.90

Chart No 1: Month wise CO<sub>2</sub> Emissions:



## CHAPTER IV STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed Solar Thermal Water Heating System of Capacity 2000 LPD at the Hostel block.

The College has Solar Street Lights

Photographs of Solar Street Light and Solar Thermal Water Heating System:

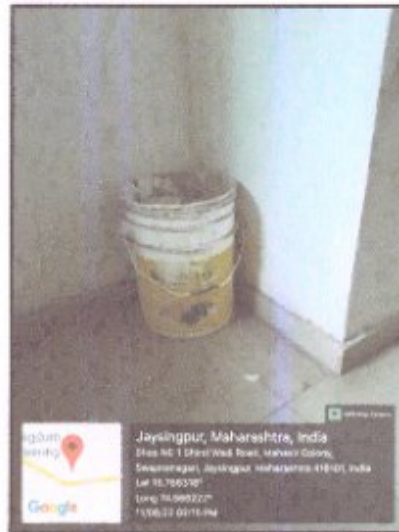


## CHAPTER V STUDY OF WASTE MANAGEMENT

### 5.1 Segregation of Waste at Source:

The recyclable waste, like paper, plastic waste is segregated at source by making provision of waste collection bins at different locations.

#### Photograph of Waste Collection Bins:



### 5.2 Bio Tumbler Unit:

The College is installing Bio Tumbler Unit, to convert the leafy waste into Bio compost.

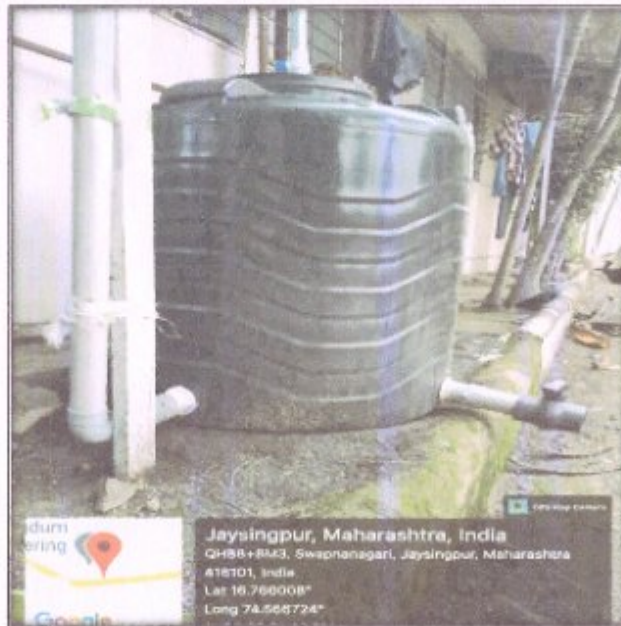
#### Photograph of Bio Tumbler Unit being constructed at College Work Shop:



### 5.3 Bio Gas Plant:

The College is installing a Bio Gas Unit to convert the Canteen Waste into Bio Gas.

Photograph of under construction Bio Gas Plant:



### 5.4 E Waste Management:

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



## CHAPTER-VI STUDY OF WATER CONSERVATION & RAIN WATER MANAGEMENT

The rain water falling on the terrace is channelized through pipes and is used for recharging the bore well as well as stored in a Water Tank, which is further used for watering the Trees and Plants.

Photograph of Rain Water Storage Tank and Bore well Recharge Point:



## CHAPTER-VII STUDY OF GREEN & SUSTAINABLE PRACTICES

### 7.1 Pedestrian Friendly Road:

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 and Lawn in the campus.

Photograph of Internal Tree plantation:



### 7.3 Provision of Ramp:

Engress Services, Pune



For easy movement of Divyangajan, the College has made provision of Ramp as well as wheel chair.

**Photograph of Ramp & Dedicated Wheel Chair:**



#### 7.4 Creation of Awareness about Energy Conservation:

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

**Photograph of Poster on Energy Conservation:**



**ANNEXURE-I****LIST OF TREES AND PLANTS**

No	Common Name of Plant	No	Common Name of Plant
1	Nimba	28	Trailing Lantana
2	Karanj	29	kaner
3	Bamboo	30	Spider Lily
4	Vad	31	Mango
5	Vasa	32	Mankachu
6	Karaveer	33	Tri Colour Dragon tree
7	Kamal	34	Cordyline Firebrand
8	Aragagvadh	35	Nilgiri
9	Tulasi	36	Shevari
10	Chafa	37	Fire Dragon Plant
11	Saptarni	38	Ruffled Fan Palm
12	Sadafuli	39	Butterfly Palm
13	PiwalimendiPiwaliMendi	40	Queen Palm
14	Almond	41	Royal Palm
15	Jasmin	42	Travelers Palm
16	Kadehura	43	King Sago
17	Puerto Rican royal palm	44	Bermuda Grass
18	Chinese Abelia	45	Croton
19	Sago Palm	46	Rubber Tree
20	Qunine Tree	47	Adulsa
21	Golden Quinine	48	Ghaneri
22	Ixora	49	Champa
23	Nandaruk,	50	Gulab
24	Khajoti	51	Yellow Creeping Daisy
25	Copper leaf	52	Indian Pulai,
26	Bandgul	53	Purple Heart
27	Yellow Flame	54	Gulmochar







Dr. J. J. Magdum Trust's  
**Dr. J. J. Magdum College of Engineering,  
Jaysingpur.**

# **Energy Audit**

## **2022-23**



# ENERGY AUDIT REPORT

of

Dr. J. J. Magdum Trust's,  
**DR. J. J. MAGDUM COLLEGE OF ENGINEERING,**  
Jaysingpur, 416 101



Year: 2022-23



Prepared by:

## ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,  
Near Muktangan English School, Parvati, Pune 411009  
Phone: 09890444795, Email: [engress123@gmail.com](mailto:engress123@gmail.com)



## INDEX

Sr. No	Particulars	Page No
I	Acknowledgement	5
II	Executive Summary	6
III	Abbreviations	7
1	Introduction	8
2	Study of Connected Load	9
3	Study of Present Energy Consumption	10
4	Study of Energy Performance Index	11
5	Study of Lighting	12
6	Study of Renewable Energy & Energy Efficiency	14



## ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Dr. J. J. Magdum Trust's Dr. J. J. Magdum College of Engineering Jaysingpur, 416 101 for awarding us the assignment of Energy Audit of their Campus for the Year: 2022-23.

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



## EXECUTIVE SUMMARY

1. Dr. J. J. Magdum Trust's Dr. J. J. Magdum College of Engineering Jaysingpur uses Energy in the form of **Electrical Energy**; used for various Electrical Equipment.

### 2. Present Connected Load & Energy Consumption:

No	Particulars	Value	Unit
1	Total Connected Load	223.31	kW
2	Annual Energy Purchased	105329	kWh

### 3. Energy Performance Index:

No	Particulars	Value	Unit
1	Total Annual Energy Purchased	105329	kWh
2	Total Built up area of Institute	15222.12	m <sup>2</sup>
3	Energy Performance Index =(1) / (2)	6.92	kWh/m <sup>2</sup>

### 4. Study of % Usage of LED Lighting:

No	Particulars	Value	Unit
1	% of Usage of LED Lighting to Total Lighting Load	9.86	%

### 5. Renewable Energy & Energy Efficiency Projects:

1. Installation of Solar Thermal Water Heating System at the Hostel block.
2. Usage of Solar Street Lights
3. Usage of LED Lighting

### 6. Assumption:

1. 1 kWh of Electrical Energy releases 0.9 Kg of CO<sub>2</sub> into atmosphere

### 7. References:

- Audit Methodology: [www.mahaurja.com](http://www.mahaurja.com)
- Energy Conservation Building Code: ECBC-2017: [www.beeindia.gov.in](http://www.beeindia.gov.in)
- For CO<sub>2</sub> Emissions: [www.tatapower.com](http://www.tatapower.com)
- For Solar PV Energy generation: [www.solarrooftop.gov.in](http://www.solarrooftop.gov.in)



## ABBREVIATIONS

LED	:	Light Emitting Diode
MSEDCL	:	Maharashtra State Electricity Distribution Company Limited
BEE	:	Bureau of Energy Efficiency
FTL	:	Fluorescent Tube Light
PV	:	Photo Voltaic
Kg	:	Kilo Gram
kWh	:	kilo-Watt Hour
CO <sub>2</sub>	:	Carbon Di Oxide
MT	:	Metric Ton



## CHAPTER-I INTRODUCTION

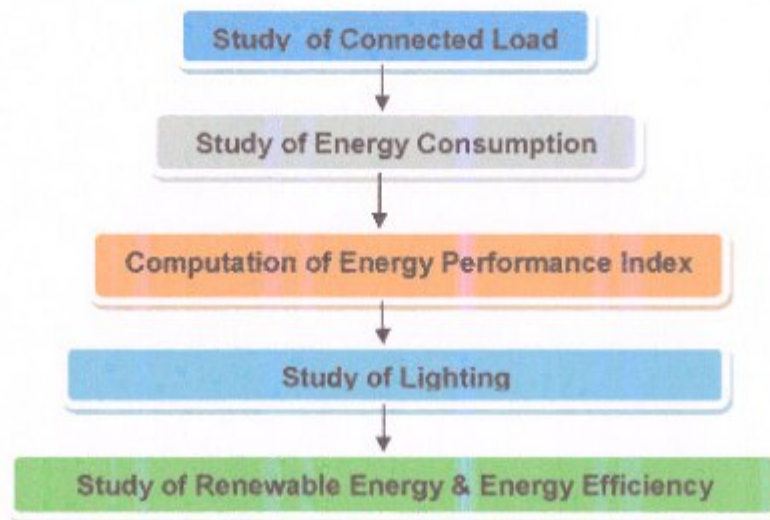
### 1.1 Introduction:

An Energy Audit is conducted at Dr. J. J. Magdum Trust's Dr. J. J. Magdum College of Engineering Jaysingpur.

The guidelines followed for conducting the Energy Audit are:

- BEE India's Energy Conservation Building Code: ECBC-2017
- Maharashtra Energy Development Agency ([www.mahaurja.com](http://www.mahaurja.com))
- Tata Power: [www.tatapower.com](http://www.tatapower.com)

### 1.2 Audit Procedural Steps:



### 1.3 Institute Location Image:



Institute  
Campus



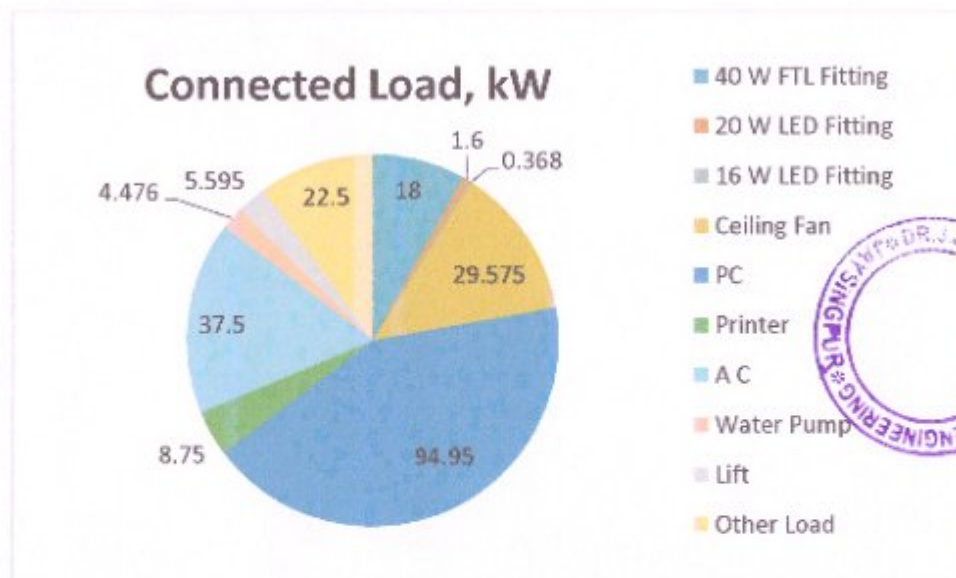
## CHAPTER-II STUDY OF CONNECTED LOAD

The major contributors to the connected load of the College include:

Table No 1: Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	40 W FTL Fitting	450	40	18
2	20 W LED Fitting	80	20	1.6
3	16 W LED Fitting	23	16	0.368
4	Ceiling Fan	455	65	29.575
5	PC	633	150	94.95
6	Printer	50	175	8.75
7	A C	20	1875	37.5
8	Water Pump	2	2238	4.476
9	Lift	1	5595	5.595
10	Other Load	150	150	22.5
11	<b>Total</b>			<b>223.31</b>

Chart No 1: Study of Connected Load:





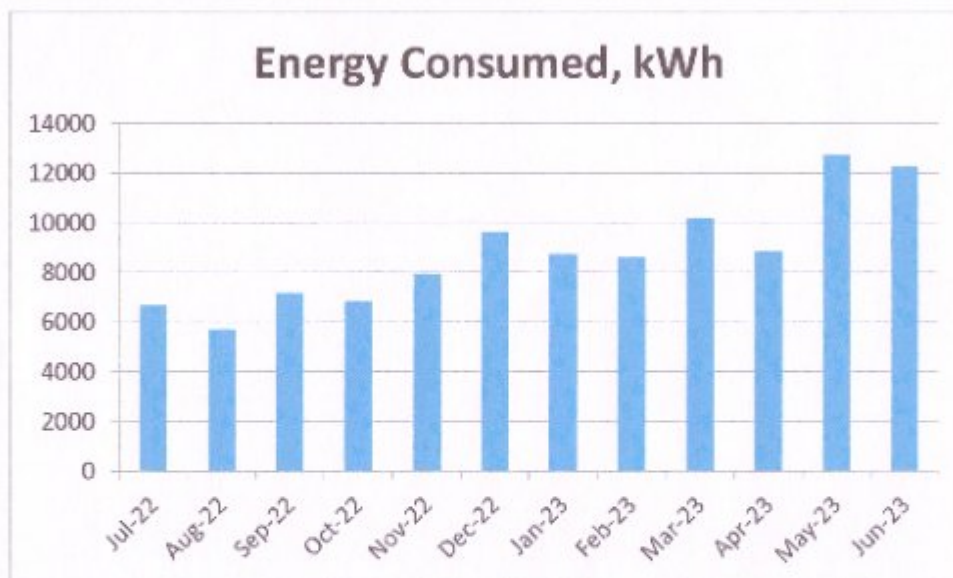
### CHAPTER-III STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Electrical Bill Analysis- 2022-23:

No	Month	Energy Consumed, kWh	CO2 Emissions, MT
1	Jul-22	6681	6.01
2	Aug-22	5713	5.14
3	Sep-22	7188	6.47
4	Oct-22	6819	6.14
5	Nov-22	7919	7.13
6	Dec-22	9616	8.65
7	Jan-23	8732	7.86
8	Feb-23	8606	7.75
9	Mar-23	10196	9.18
10	Apr-23	8840	7.96
11	May-23	12730	11.46
12	Jun-23	12289	11.06
13	Total	105329	94.80
14	Maximum	12730	11.46
15	Minimum	5713	5.14
16	Average	8777.42	7.90

Chart No 2: Variation in Monthly Energy Consumption:



## CHAPTER-IV STUDY OF ENERGY PERFORMANCE INDEX

**Energy Performance Index:** Energy Performance Index of a Building is its Annual Energy Consumption in Kilo Watt Hours per square meter of the Building

It is determined by:

$$\text{EPI} = \frac{\text{(Annual Energy Consumption in kWh)}}{\text{(Total Built-up area in m}^2\text{)}}$$

Now we compute the EPI for the Institute as under:

**Table No 3: Computation of Energy Performance Index:**

No	Particulars	Value	Unit
1	Total Annual Energy Purchased	105329	kWh
2	Total Built up area of Institute	15222.12	m <sup>2</sup>
3	Energy Performance Index =(1) / (2)	6.92	kWh/m <sup>2</sup>



## CHAPTER V STUDY OF LIGHTING

### Terminology:

1. **Lumen** is a unit of light flow or luminous flux. The lumen rating of a lamp is a measure of the total light output of the lamp. The most common measurement of light output (or luminous flux) is the lumen. Light sources are labeled with an output rating in lumens.

2. **Lux** is the metric unit of measure for illuminance of a surface. One lux is equal to one lumen per square meter.

3. **Circuit Watts** is the total power drawn by lamps and ballasts in a lighting circuit under assessment.

4. **Installed Load Efficacy** is the average maintained illuminance provided on a horizontal working plane per circuit watt with general lighting of an interior. Unit: lux per watt per square metre ( $\text{lux/W/m}^2$ )

5. **Lamp Circuit Efficacy** is the amount of light (lumens) emitted by a lamp for each watt of power consumed by the lamp circuit, i.e. including control gear losses. This is a more meaningful measure for those lamps that require control gear. Unit: lumens per circuit watt ( $\text{lm/W}$ )

6. **Installed Power Density.** The installed power density per 100 lux is the power needed per square metre of floor area to achieve 100 lux of average maintained illuminance on a horizontal working plane with general lighting of an interior. Unit: watts per square metre per 100 lux ( $\text{W/m}^2/100 \text{ lux}$ ) 100 Installed power density ( $\text{W/m}^2/100 \text{ lux}$ )

7. **Lighting Power Density:** It is defined as Total Lighting Load in a room divided by the Area of that Room in square meters.

In this Chapter we compute the percentage usage of LED Lighting to total Lighting Load of the Institute.

Table No 4: Percentage Usage of LED Lighting to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL fittings	450	Nos
2	Load/Unit of 40 W FTL fitting	40	W/unit
3	Demand of 40 W FTL fittings	18	kW
4	No of 20 W LED fitting	80	Nos
5	Load/Unit of 20 W LED fitting	20	W/unit



6	Demand of 20 W LED fitting	1.6	kW
7	No of 16 W LED Fitting	23	Nos
8	Load/Unit of 16 W LED fitting	16	W/unit
9	Demand of 16 W LED fitting	0.368	kW
10	Total LED Lighting Load= 8+9	1.968	kW
11	Total LED Lighting Load= 8+9	19.968	kW
12	% of LED s to Total Lighting Load = $(10) \times 100 / (11)$	9.86	%



## CHAPTER-VI STUDY OF RENEWABLE ENERGY & ENERGY EFFICIENCY

### 6.1 Usage of Renewable Energy:

The Institute has installed Roof Top Solar Thermal Water Heating System at Hostel Block and Solar Street Lights.

Photographs of Solar Street Light and Solar Thermal Water Heating System:



### 6.2 Energy Efficiency Projects implemented:

- Usage of Energy Efficient LED Fittings





Dr. J. J. Magdum Trust's  
**Dr. J. J. Magdum College of Engineering,**  
Jaysingpur.

# **Environment Audit**

## **2022-23**



**ENVIRONMENTAL AUDIT REPORT**  
of  
Dr. J. J. Magdum Trust's,  
**DR. J. J. MAGDUM COLLEGE OF ENGINEERING,**  
Jaysingpur, 416 101



Year: 2022-23

*J.*



Prepared by:

**ENGRESS SERVICES**

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



## INDEX

Sr. No	Particulars	Page No
I	Acknowledgement	5
II	Executive Summary	6
III	Abbreviations	8
1	Introduction	9
2	Study of Resource Consumption & CO <sub>2</sub> Emission	11
3	Study of Usage of Renewable Energy	13
4	Study of Indoor Air Quality	14
5	Study of Indoor Comfort Condition Parameters	15
6	Study of Waste Management	16
7	Study of Water Conservation & Rain water Management	18
8	Study of Eco Friendly Initiatives	19
	<b>Annexure</b>	
I	Indoor Air Quality, Noise, & Indoor Comfort Standards	20





## ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Dr. J. J. Magdum Trust's Dr. J. J. Magdum College of Engineering Jaysingpur, 416 101, for awarding us the assignment of Environmental Audit of their Campus for the Year: 2022-23.

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



## EXECUTIVE SUMMARY

1. Dr. J. J. Magdum Trust's Dr. J. J. Magdum College of Engineering Jaysingpur uses Energy in the form of **Electrical Energy**; used for various Electrical Equipment.

### 2. Pollution due to Institute Activities:

- **Air pollution:** Mainly CO<sub>2</sub> on account of Electricity Consumption
- **Solid Waste:** Bio degradable Garden Waste, Paper Waste
- **Liquid Waste:** Human Liquid waste

### 3. Present Energy Consumption & CO<sub>2</sub> Emission:

No	Particulars	Value	Unit
1	Annual Energy Consumed	105329	kWh
2	Annual CO <sub>2</sub> Emissions	94.80	MT

### 4. Usage of Renewable Energy:

- Installation of Solar Thermal Water Heating System at the Hostel block.
- Installation of Solar Street Lights

### 5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	40	24	31
2	Minimum	36	22	24

### 6. Indoor Comfort Conditions:

No	Parameter/Value	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	27.6	52.1	165	45
2	Minimum	27	51.8	119	39

### 7. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Organic Waste	Installed Bio- tumbler Unit
3	Food Waste	In process installation of Bio Gas plant
4	E Waste	Disposed of through Authorized Agency

### 8. Water Conservation & Rain Water Management:

The rain water falling on the terrace is channelized through pipes and is used for recharging the bore well as well as stored in a Water Tank, which is further used for watering the Trees and Plants.

### 9. Environment Friendly Initiatives:

- Tree Plantation in the campus.
- Creation of awareness on Energy Conservation Display of Posters

### 10. Assumption:

1. 1 kWh of Electrical Energy releases 0.9 Kg of CO<sub>2</sub> into atmosphere

### 11. References:

- For CO<sub>2</sub> Emissions: [www.tatapower.com](http://www.tatapower.com)
- For Various Indoor Air Parameters: [www.ishrae.com](http://www.ishrae.com)
- For AQI & Water Quality Standards: [www.cpcb.com](http://www.cpcb.com)



## ABBREVIATIONS

Kg	: Kilo Gram
MSEDCL	: Maharashtra State Distribution Company Limited
MT	: Metric Ton
kWh	: kilo-Watt Hour
LED	: Light Emitting Diode
AQI	: Air Quality Index
PM-2.5	: Particulate Matter of Size 2.5 Micron
PM-10	: Particulate Matter of Size 10 Micron
CPCB	: Central Pollution Control Board
ISHRAE	: The Indian Society of Heating & Refrigerating & Air Conditioning Engineers



## CHAPTER-I INTRODUCTION

### 1. Important Definitions:

#### 1.1. Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

#### 1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

*According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment"*

**1.3. Environmental Pollutant:** means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

#### 1.4 Audit Procedural Steps:



### 1.3 Institute Location Image:



Institute  
Campus

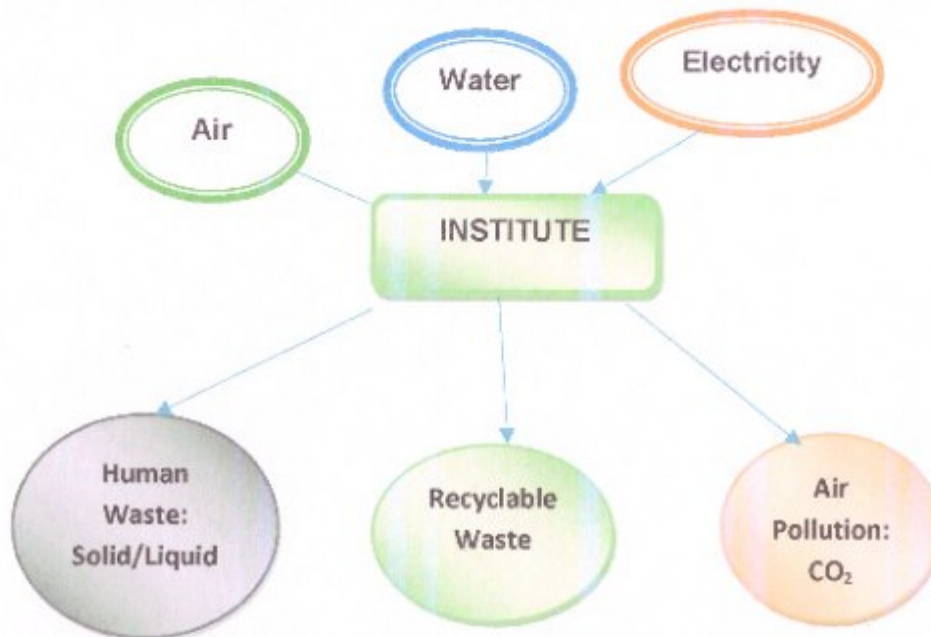


## CHAPTER-II STUDY OF RESOURCE CONSUMPTION & CO<sub>2</sub> EMISSION

The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the Institute System & Environment as under.  
Chart No 1: Representation of Institute as System & Study of Resources & Waste



Now we compute the Generation of CO<sub>2</sub> on account of consumption of Electrical Energy. The basis of Calculation for CO<sub>2</sub> emissions due to Electrical Energy is as under.

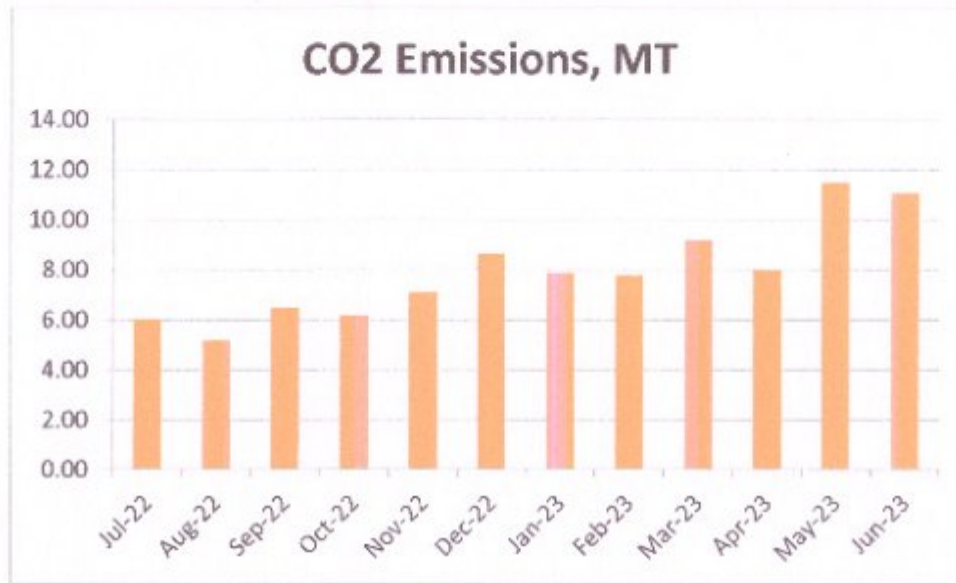
- 1 kWh of Electrical Energy releases 0.9 Kg of CO<sub>2</sub> into atmosphere

Table No 1: Study of Purchase of Energy & CO<sub>2</sub> Emissions: 22-23:

No	Month	Energy Consumed, kWh	CO <sub>2</sub> Emissions, MT
1	Jul-22	6681	6.01
2	Aug-22	5713	5.14
3	Sep-22	7188	6.47
4	Oct-22	6819	6.14
5	Nov-22	7919	7.13
6	Dec-22	9616	8.65
7	Jan-23	8732	7.86
8	Feb-23	8606	7.75

9	Mar-23	10196	9.18
10	Apr-23	8840	7.96
11	May-23	12730	11.46
12	Jun-23	12289	11.06
13	Total	105329	94.80
14	Maximum	12730	11.46
15	Minimum	5713	5.14
16	Average	8777.42	7.90

Chart No 2: Month wise CO<sub>2</sub> Emissions:





### CHAPTER III STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed Solar Thermal Water Heating System of Capacity 2000 LPD at the Hostel block.

The College has Solar Street Lights

Photographs of Solar Street Light and Solar Thermal Water Heating System:



## CHAPTER IV STUDY OF INDOOR AIR QUALITY

### 4.1 Importance of Air Quality:

**Air:** The common name given to the atmospheric gases used in breathing and photosynthesis.

By volume, Dry Air contains 78.09% Nitrogen, 20.95% Oxygen, 0.93% Argon, 0.039% carbon dioxide, and small amounts of other gases.

On average, a person inhales about **14,000 liters** of air every day. Therefore, poor air quality may affect the quality of life now and for future generations by affecting the health, the environment, the economy and the city's livability.

**Air quality is a measure of the suitability of air for breathing by people, plants and animals.**


### 4.2 Air Quality Index:

An **Air Quality Index (AQI)** is a number used by government agencies to measure the air pollution levels and communicate it to the population. As the AQI increases, it means that a large percentage of the population will experience severe adverse health effects.

We present herewith following important Parameters.

1. AQI- Air Quality Index
2. PM-2.5- Particulate Matter of Size 2.5 micron
3. PM-10- Particulate Matter of Size 10 micron

**Table No 4: Indoor Air Quality Parameters:**



No	Location	AQI	PM-2.5	PM-10
1	Transportation Lab	40	24	29
2	Class Room	36	22	24
3	Faculty Room	40	24	31
4	Computer Lab	36	22	25
5	Library	38	24	30
	Maximum	40	24	31
	Minimum	36	22	24

## CHAPTER V STUDY OF INDOOR COMFORT CONDITION PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit. The Parameters include:

1. Temperature
2. Humidity
3. Lux Level
4. Noise Level.

Table No 5: Study of Indoor Comfort Condition Parameters:

No	Location	Temperature, 0C	Humidity, %	Lux Level	Noise Level, dB
1	Dean Sir Office	27	52	127	39
2	Transportation Lab	27.3	52.1	129	41
3	Class Room	27.5	51.9	135	43
4	Faculty Room	27.6	51.8	165	41
5	PG Tutorial Room	27.6	51.9	119	45
	Maximum	27.6	52.1	165	45
	Minimum	27	51.8	119	39

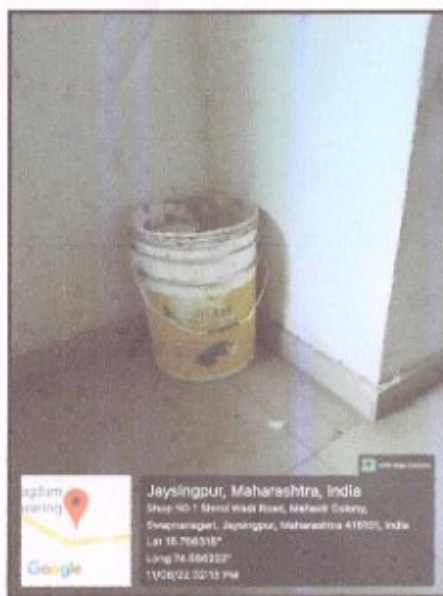


## CHAPTER VI STUDY OF WASTE MANAGEMENT

### 6.1 Segregation of Waste at Source:

The recyclable waste, like paper, plastic waste is segregated at source by making provision of waste collection bins at different locations.

#### Photograph of Waste Collection Bins:



### 6.2 Bio Tumbler Unit:

The College is installing Bio Tumbler Unit, to convert the leafy waste into Bio Compost.

#### Photograph of Bio Tumbler Unit being constructed at College Work Shop:



### 6.3 Bio Gas Plant:

The College is installing a Bio Gas Unit to convert the Canteen Waste into Bio Gas.

#### Photograph of under construction Bio Gas Plant:



### 6.4 E Waste Management:

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



## CHAPTER-VII STUDY OF WATER CONSERVATION & RAIN WATER MANAGEMENT

The rain water falling on the terrace is channelized through pipes and is used for recharging the bore well as well as stored in a Water Tank, which is further used for watering the Trees and Plants.

Photograph of Rain Water Storage Tank and Bore well Recharge Point:

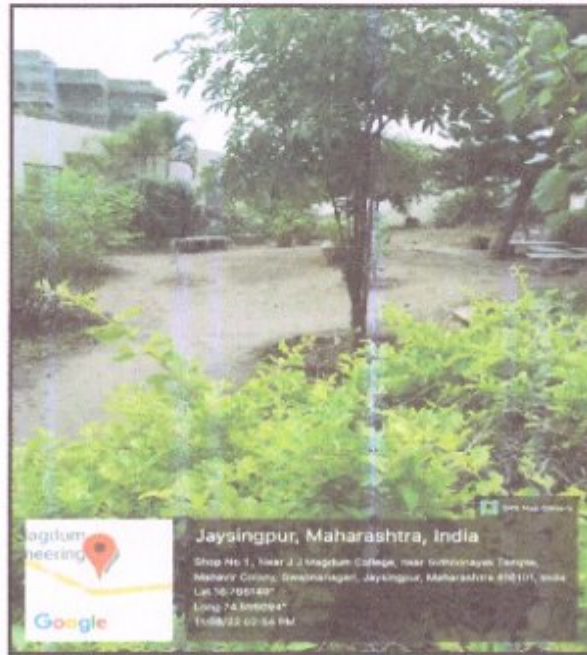


## CHAPTER-VIII STUDY OF ECO FRIENDLY INITIATIVES

### 8.1 Internal Tree Plantation:

The Institute has well maintained landscaped garden in the campus.

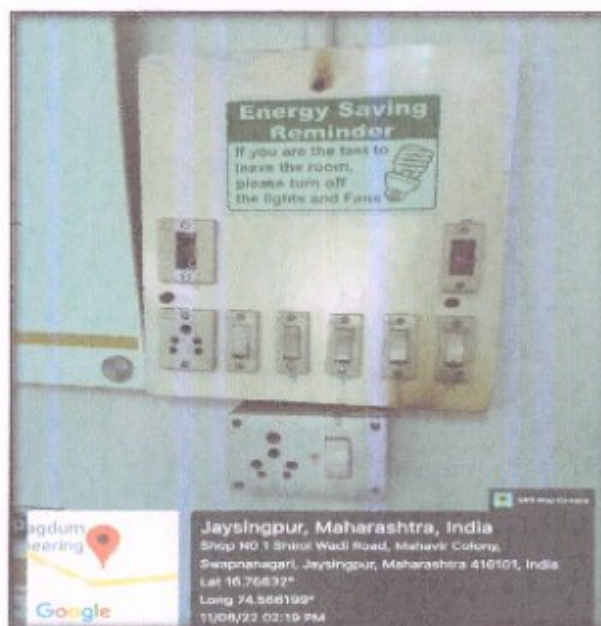
Photograph of Tree plantation:



### 8.2 Creation of Awareness about Energy Conservation:

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

Photograph of Poster on Energy Conservation:



**ANNEXURE-I:  
VARIOUS AIR QUALITY, WATER QUALITY, NOISE & INDOOR  
COMFORT STANDARDS:**

**1. Category Wise Air Quality Index Values & Concentration of PM 2.5 & PM10:**

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

**2. Recommended Noise Level Standards:**

No	Location	Noise Level dB
1	Auditoriums	20-25
2	Outdoor Playground	55
3	Occupied Class Room	40-45
4	Un occupied Class Room	35
5	Apartment, Homes	35-40
6	Offices	45-50
7	Libraries	35-40
8	Restaurants	50-55

**3. Thermal Comfort Conditions: For Non-conditioned Buildings:**

No	Parameter	Value
1	Temperature	Less Than 33°C
2	Humidity	Less Than 70%

