

ENVIRONMENTAL AUDIT REPORT

of

ASM's INSTITUTE OF PROFESSIONAL STUDIES,

Pimpri, Pune 411 018



Year: 2021-22

Prepared by

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society

Near Muktangan English School, Parvati, Pune 411009

Phone: 09890444795 Email: engress123@gmail.com



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'**

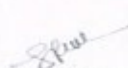
We hereby certify that, the firm having following particulars is registered with **MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)** under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

Name and Address of the firm : M/s Engress Services
Yashshree, 26, Nirmal Bag Society,
Near Muktangan 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 (FC)

 **GEM Certificate** 

ASSOCHAM 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.
ASSOCHAM feels proud to award the GEM Certified Professional title to him/her


Pankaj R. Dharkar
Chairman, GEM

GEM CP 22/788


Deepak Sood
Secretary General, ASSOCHAM



ENGRESS SERVICES

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

Ref: ES/ASMCSIT/21-22/03

Date: 23/6/2022

CERTIFICATE

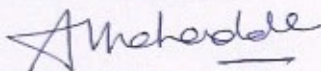
This is to certify that we have conducted Environmental Audit at ASM's Institute of Professional studies, Pimpri, Pune 411 018 in the year 2021-22.

The Institute has adopted Environment Friendly Practices:

- Usage of Energy Efficient LED Fittings
- In process installation of Roof Top 2.5 kWp Solar PV Plant
- Segregation of Waste at source
- Installation of Sanitary Waste Incinerator, for disposal of Sanitary Waste
- Installation of Rain Water Management 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 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 at Engress Services, 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 Environmental Audit of their Pimpri campus for the Year: 21-22

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. **Pollution due to Day to Day Activities:**

- **Air pollution:** Mainly CO₂ on account of Electricity Consumption
- **Solid Waste:** Bio degradable Waste, Garden Waste, Recyclable Waste and Human Waste
- **Liquid Waste:** Human Liquid waste

3. **Energy Consumed & CO₂ Emission:**

No	Parameter	Energy Consumed, kWh	CO ₂ emissions, MT
1	Total	45345	40.81
2	Maximum	4677	4.21
3	Minimum	2942	2.65
4	Average	3779	3.40

4. **Various Majors Adopted for Environmental Conservation:**

- Usage of Energy Efficient LED fittings
- Usage of BEE STAR Rated Equipment
- In process installation of **2.5 kWp** Roof Top Solar PV Plant

5. **Usage of Renewable Energy:**

- The Institute is in process of installation of **2.5 kWp** Roof Top Solar PV Plant.

6. **Indoor Air Quality Parameters:**

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	163	86	93
2	Minimum	146	65	79

7. **Indoor Comfort Condition Parameters:**

No	Parameter/Value	Temperature, °C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	30.1	41	198	45
2	Minimum	29.8	40	98	38.9

8. Waste Management:

8.1 Segregation of Waste at Source:

The Waste is segregated at source and the recyclable waste like Paper waste, Plastic Waste is handed over to authorized agency.

8.2 Sanitary Waste Management:

The Institute has installed Sanitary Waste Incinerator, for disposal of Sanitary Waste.

8.3 Organic Waste Management:

It is recommended to compost the organic waste like leafy and canteen waste.

8.4 E-Waste Management:

It is recommended to dispose of the E-Waste through Authorized Agency.

9. Rain Water Management:

The Institute has installed Rainwater Management Project. The rain water falling on the terrace is collected through pipes and is used to increase the underground water table.

10. Eco Friendly Practices:

- Internal Tree Plantation
- Creation of Awareness on Resource Conservation by Display of Posters

11. Assumption:

- 1 kWh (Unit) of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere

12. References:

1. For CO₂ calculations: www.tatapower.com
2. For Various Indoor Air Parameters: www.ishrae.com
3. For AQI & Water Quality Standards: www.cpcb.com

ABBREVIATIONS

ASM	:	Audyogik Shikshan Mandal
AQI	:	Air Quality Index
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
MT	:	Metric Ton
CO ₂	:	Carbon Di Oxide
ISHRAE	:	The Indian Society of Heating, Refrigerating & Air conditioning Engineers
CPCB	:	Central Pollution Control Board
LPD	:	Liters Per Day
PM	:	Particulate Matter

CHAPTER-I INTRODUCTION

1.1 Important Definitions:

1.1.1 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

1.1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are complied 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

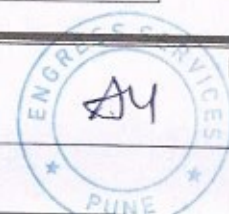
1.1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.1.4. Relevant Environmental Laws in India: Table No-1:

1927	The Indian Forest Act
1972	The Wildlife Protection Act
1974	The Water (Prevention and Control of Pollution) Act
1977	The Water (Prevention & Control of Pollution) Cess Act
1980	The Forest (Conservation) Act
1981	The Air (Prevention and Control of Pollution) Act
1986	The Environment Protection Act
1991	The Public Liability Insurance Act
2002	The Biological Diversity Act
2010	The National Green Tribunal Act

1.1.5. Some Important Environmental Rules in India: Table No-2:

1989	Hazardous Waste (Management and Handling) Rules
1989	Manufacture, Storage and Import of Hazardous Chemical Rules
2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Siting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules
2011	E-waste (Management and Handling) Rules



2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research Institute)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency)
10.	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

1.2 Objectives:

1. To study Recourse Consumption and CO₂ Emission
2. To Study CO₂ Emission Reduction
3. To Study Indoor Air Quality
4. To study Indoor Comfort Parameters
5. To Study Waste Management Practices
6. To Study Rain Water Harvesting
7. To study Environment Friendly Practices

1.3 Google Earth Image:



Institute
Campus

1.4 Table No 4: 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

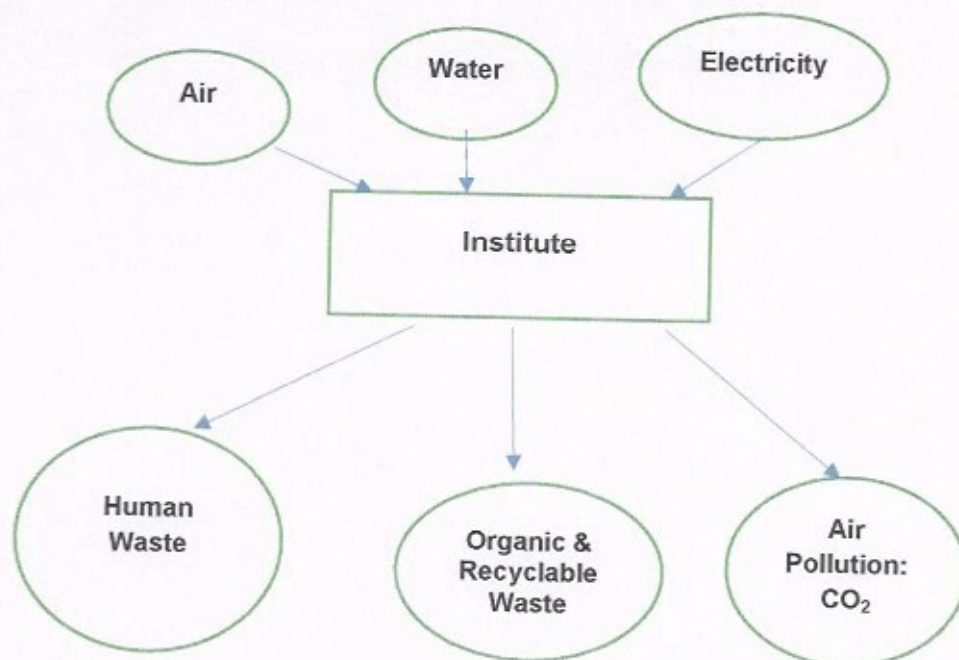
STUDY OF RESOURCE CONSUMPTION & CO₂ EMISSION

The Institute consumes following Natural/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:



We compute the Generation of CO₂ on account of consumption of Electrical Energy as under. 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.

Table No 5: Electrical Energy Usage & CO₂ Emission: 21-22:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Apr-21	3109	2.80
2	May-21	2942	2.65
3	Jun-21	3544	3.19
4	Jul-21	4159	3.74
5	Aug-21	3292	2.96

6	Sep-21	3401	3.06
7	Oct-21	4137	3.72
8	Nov-21	3992	3.59
9	Dec-21	4677	4.21
10	Jan-22	4490	4.04
11	Feb-22	3782	3.40
12	Mar-22	3820	3.44
13	Total	45345	40.81
14	Maximum	4677	4.21
15	Minimum	2942	2.65
16	Average	3779	3.40

Chart No 2: To study CO₂ Emission:

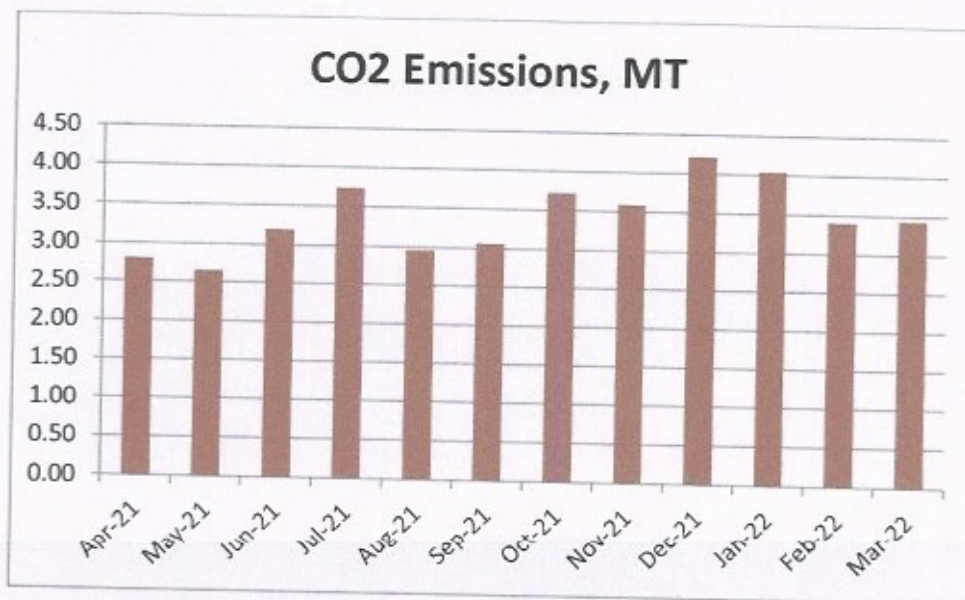


Table No 6: Important parameters:

No	Parameter	Energy Purchased, kWh	CO ₂ Emissions, MT
1	Total	45345	40.81
2	Maximum	4677	4.21
3	Minimum	2942	2.65
4	Average	3779	3.40

CHAPTER-III

STUDY OF USAGE OF RENEWABLE ENERGY

The Institute is in process of installation of 2.5 kWp Roof top Solar PV Plant.



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.

Rapid urbanization and industrialization has added other elements/compounds to the pure air and thus caused the increase in pollution. In order to prevent, control and abate air pollution, the Air (Prevention and Control of Pollution) Act was enacted in 1981.

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

According to Section 2(b) of Air (Prevention and control of pollution) Act, 1981 'air pollution' has been defined as 'the presence in the atmosphere of any air pollutant.'

As per Section 2(a) of Air (Prevention and control of pollution) Act, 1981 'air pollutant' has been defined as 'any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment

4.2 Air Quality Index:

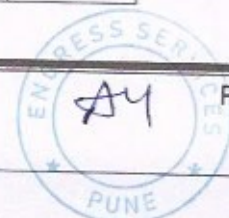
An **Air Quality Index (AQI)** is a number used by government agencies to measure the **air pollution** levels and communicate it to the population. As the AQI increases, it means that a large percentage of the population will experience severe adverse health effects. The measurement of the AQI requires an **air monitor** and an **air pollutant** concentration over a specified **averaging period**.

We present herewith following important Parameters.

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

Table No 7: Indoor Air Quality Parameters:

No	Location	AQI	PM-2.5	PM-10
	Ground Floor			
1	Porch	150	75	87
2	Seminar Hall	160	78	93



	First Floor			
3	Office	150	76	88
4	Training & Placement Office	148	80	87
	Second Floor			
5	R-201 Computer Center	163	79	90
6	R-206 Faculty Room	146	65	79
	Third Floor			
7	301-Computer Lab	150	77	90
8	302-Library	149	78	88
	Fourth Floor			
9	Staff Room	156	86	92
10	Classroom	160	78	90
	Fifth Floor			
11	Classroom	161	78	93
12	Staff Room	158	77	90
	Maximum	163	86	93
	Minimum	146	65	79

CHAPTER-V

STUDY OF INDOOR AIR COMFORT 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 8: Study of Indoor Comfort Parameters:

No	Location	Temperature, 0C	Humidity, %	Lux Level	Noise Level, dB
	Ground Floor				
1	Porch	30	40	198	45
2	Seminar Hall	30.1	41	165	44.9
	First Floor				
3	Office	30	41	147	43.6
4	Training & Placement Office	30	41	169	42.9
	Second Floor				
5	R-201 Computer Center	29.8	41	165	45
6	R-206 Faculty Room	29.9	41	195	44.8
	Third Floor				
7	301-Computer Lab	29.9	40	146	44.3
8	302-Library	30	41	169	44.2
	Fourth Floor				
9	Staff Room	30	41	146	42.5
10	Classroom	30	41	123	41
	Fifth Floor				
11	Classroom	29.8	41	98	39.6
12	Staff Room	29.8	40	102	38.9
	Maximum	30.1	41	198	45
	Minimum	29.8	40	98	38.9

CHAPTER-VI STUDY OF WASTE MANAGEMENT

6.1 Segregation of Waste at Source:

The Waste is segregated at source. Waste bins are located at various locations

Photograph of Separate Waste Collection Bin:



6.2 Sanitary Waste Management:

The Institute has a Sanitary Waste Incinerator, to dispose of the Sanitary Waste.

Photograph of Sanitary Waste Incinerator:



6.3 Organic Waste Management:

It is recommended to compost the organic waste like leafy and canteen waste.

6.4 E-Waste Management:

It is recommended to dispose of the E-Waste through Authorized Agency.

CHAPTER-VII STUDY OF RAIN WATER MANAGEMENT

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

Photograph of Rain Water Carrying Pipe:



Rain Water Pipe

GPS Map Camera

Pimpri-Chinchwad, Maharashtra, India

Asm Group Of Institute, Asm Group Of Institute,
Service Rd, MIDC, Pimpri Colony, Pimpri-Chinchwad,
Maharashtra 411019, India
Lat 18.632566°
Long 73.799246°

CHAPTER VIII

STUDY OF ENVIRONMENT FRIENDLY INITIATIVES

8.1 Internal Tree Plantation:

The Institute has well maintained Tree plantation.

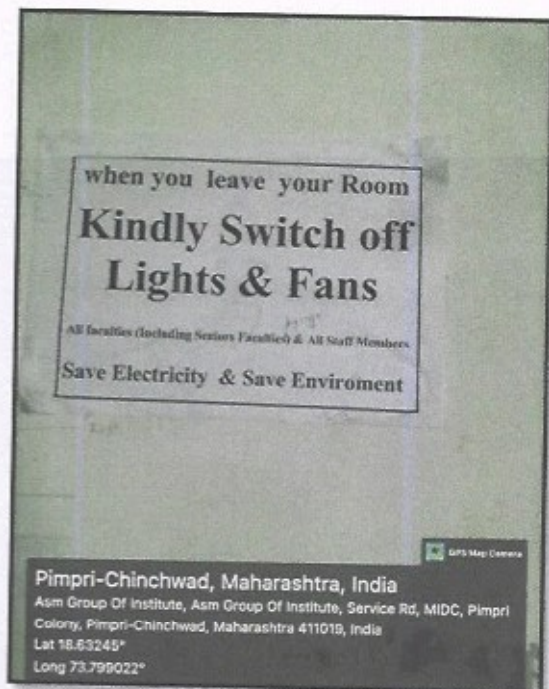
Photograph of Tree Plantation:



8.2 Creation of Awareness by Display of Posters:

The Institute has displayed posters on resource conservation.

Photograph of Poster Display Board on Resource Conservation & Cleanliness:



**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 Water Quality Standards:

No	Designated Best Use	Criteria
1	Drinking Water Source without conventional Treatment but after disinfection	pH between 6.5 to 8.5 Dissolved Oxygen 6 mg/l or more
2	Drinking water source after conventional treatment and disinfection	pH between 6 to 9 Dissolved Oxygen 4 mg/l or more
3	Outdoor Bathing (Organized)	pH between 6.5 to 8.5 Dissolved Oxygen 5 mg/l or more
4	Controlled Waste Disposal	pH between 6 to 8.5

3. 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

4. Thermal Comfort Conditions: For Non-conditioned Buildings:

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