ENVIRONMETAL AUDIT REPORT

of

ASM's INSTITUTE OF PROFESSIONAL STUDIES,

Pimpri, Pune 411 018

Year: 2020-21

Prepared by

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society
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MAHARASHTRA ENERGY DEVELOPMENT AGENCY
An ISO 9001 : 2000 Reg. no. : RQ 91 / 2462

Maharashtra Energy Development Agency

(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
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ECN/2021-22/CR-14/1577 — 22nd April, 2021

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

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

Name and Address of the firm : **M/s Enrich Consultants**
Yashashree, Plot No. 26, Nirmal Bag Society,
Near Muktangan English School, Parvati,
Pune - 411009.

Registration Category : *Empanelled Consultant for Energy Conservation Programme for Class 'A'*

Registration Number : ***MEDA/ECN/2021-22/Class A/EA-03***

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **21st April, 2023** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

ENRICH CONSULTANTS PUNE

ENRICH CONSULTANTS

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

Ref: EC/ASMCSIT/20-21/03

Date: 19/7/2021

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 2020-21.

The Institute has adopted Environment Friendly Practices:

- Usage of Energy Efficient LED Fittings
- 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

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor, EA-8192

ENRICH CONSULTANTS * PUNE *

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ACKNOWLEDGEMENT

We at Enrich Consultants, 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: 20-21

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 CO_2 on account of Electricity Consumption
- **Solid Waste:** Bio degradable Waste, Garden Waste, Recyclable Waste and Human Waste
- **Liquid Waste:** Human Liquid waste

3. Energy Purchased & CO_2 Emission:

No	Parameter	Energy Consumed, kWh	CO_2 emissions, MT
1	Total	35994	32.39
2	Maximum	4534	4.08
3	Minimum	1676	1.51
4	Average	3000	2.70

4. Various Majors Adopted for Environmental Conservation:

- Usage of Energy Efficient LED fittings
- Maximum Usage of Day Lighting

5. Usage of Renewable Energy:

- The Institute has yet to install Roof Top Solar PV Plant.

6. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	163	81	92
2	Minimum	140	72	87

7. Waste Management:

7.1 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.

7.2 Sanitary Waste Management:

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

7.3 E-Waste Management:

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

8. 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.

9. Eco Friendly Initiative:

- Internal Tree Plantation

10. Assumption:

- 1 kWh (Unit) of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

11. References:

1. For CO_2 calculations: www.tatapower.com
2. 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
CPCB	:	Central Pollution Control Board
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 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

1.1.3. 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 CO_2 Emission
2. To Study CO_2 Emission Reduction
3. To Study Indoor Air Quality
4. To Study Waste Management Practices
5. To Study Rain Water Harvesting
6. To study Environment Friendly Practices

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

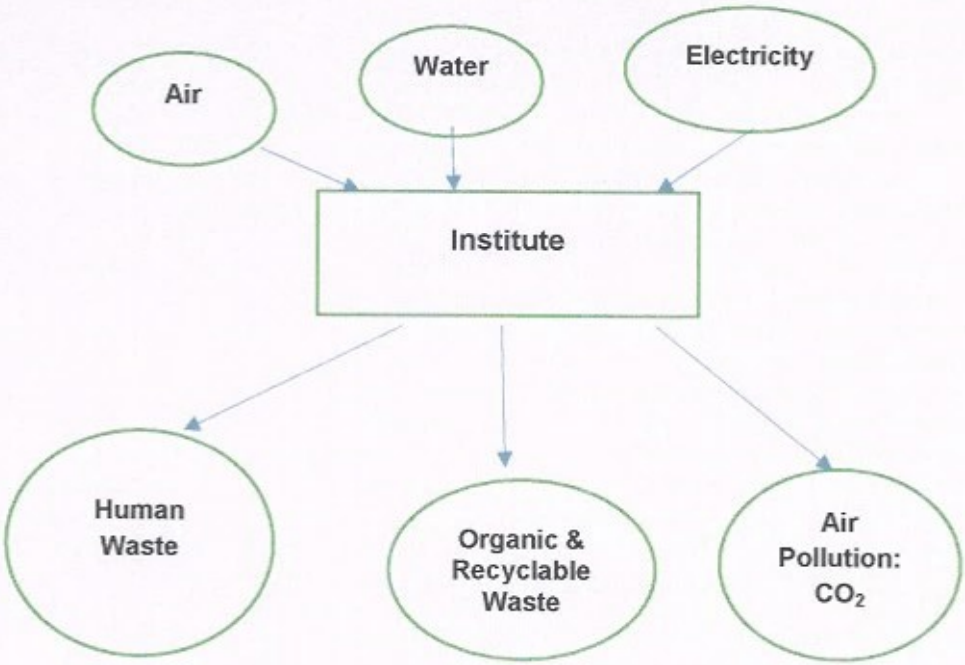
CHAPTER-II
STUDY OF RESOURCE CONSUMPTION & CO_2 EMISSION

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 CO_2 on account of consumption of Electrical Energy as under. The basis of Calculation for CO_2 emissions due to Electrical Energy are: 1 Unit (kWh) of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere.

Table No 5: Electrical Energy Usage & CO_2 Emission: 20-21:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Apr-20	1686	1.52
2	May-20	1676	1.51
3	Jun-20	1854	1.67
4	Jul-20	2026	1.82
5	Aug-20	2023	1.82

6	Sep-20	3257	2.93
7	Oct-20	3500	3.15
8	Nov-20	3269	2.94
9	Dec-20	4260	3.83
10	Jan-21	4534	4.08
11	Feb-21	3531	3.18
12	Mar-21	4377	3.94
13	Total	35994	32.39
14	Maximum	4534	4.08
15	Minimum	1676	1.51
16	Average	3000	2.70

Chart No 2: To study CO_2 Emission:

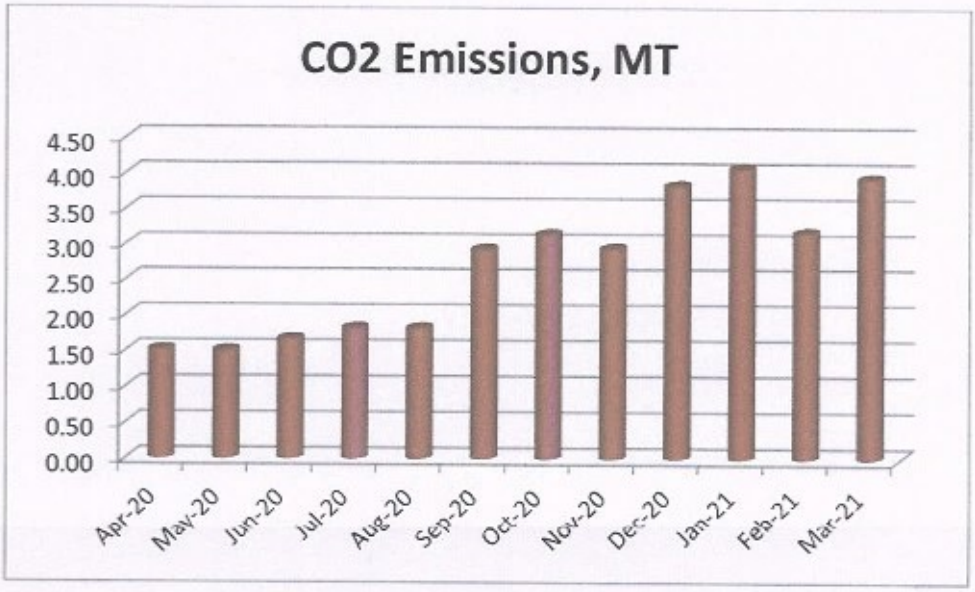


Table No 6: Important parameters:

No	Parameter	Energy Consumed, kWh	CO_2 emissions, MT
1	Total	35994	32.39
2	Maximum	4534	4.08
3	Minimum	1676	1.51
4	Average	3000	2.70

CHAPTER-III
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has yet to install 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	Store	150	75	87
2	Hall-01	163	81	92

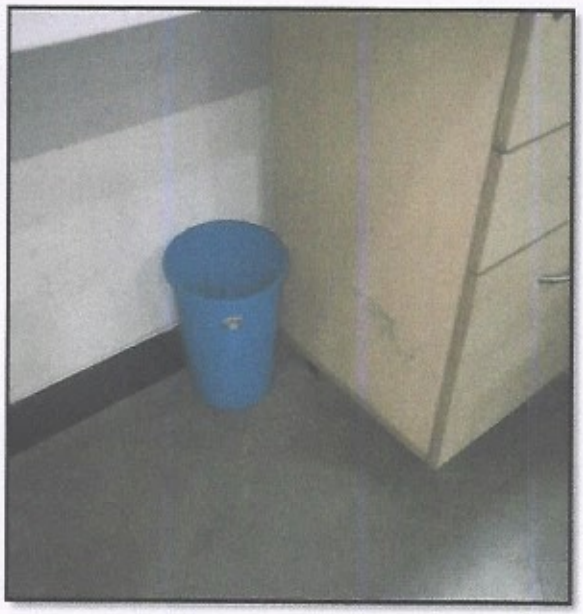
	First Floor			
3	Office	154	77	88
4	Training & Placement Office	155	78	88
	Second Floor			
5	R-203 Classroom	148	77	90
6	R-202 Store	156	78	91
	Third Floor			
7	301-Computer Lab	156	78	91
8	302-Library	153	76	89
	Fourth Floor			
9	Classroom	150	75	87
10	Sick Room	163	81	92
	Fifth Floor			
11	Classroom	140	72	87
12	Classroom	146	76	89
	Maximum	163	81	92
	Minimum	140	72	87

CHAPTER-V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

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

Photograph of Separate Waste Collection Bin:



5.2 Sanitary Waste Management:

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

Photograph of Sanitary Waste Incinerator:

5.3 E-Waste Management:

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

CHAPTER-VI
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:

CHAPTER VII
STUDY OF ENVIRONMENT FRIENDLY INITIATIVES

7.1 Internal Tree Plantation:

The Institute has well maintained Tree plantation.

Photograph of Tree Plantation:

ANNEXURE-I:
INDOOR AIR QUALITY & WATER QUALITY 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**

SUDHAKAR JANARDHAN BOKEPHODE

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