ENERGY AUDIT REPORT

of

Pragnya Education Trust's,

PRAGNYA COLLEGE OF MANAGEMENT & COMPUTER STUDIES,

S. No. 26/1/1, Handewadi Chowk, Hadapsar, Pune 412 308

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 (EC)

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

Ref: ES/PETPCOMCS/21-22/01 Date: 15/6/2022

CERTIFICATE

This is to certify that we have conducted Energy Audit at Pragnya Education Trust's Pragnya College of Management & Computer Studies, S. No. 26/1/1, Handewadi Chowk, Hadapsar, Pune 412 308 in the Year 2021-22.

.The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting

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,
Certified Energy Auditor
EA-8192

INDEX

ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management Pragnya Education Trust's Pragnya College of Management & Computer Studies, S. No. 26/1/1, Handewadi Chowk, Hadapsar, Pune 412 308, for awarding us the assignment of Energy Audit of their Handewadi Campus for the Year: 21-22.

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

EXECUTIVE SUMMARY

1. Pragnya Education Trust's Pragnya College of Management & Computer Studies, S. No. 26/1/1, Handewadi Chowk, Hadapsar, Pune 412 308 consumes Energy in the form of Electrical Energy; used for various Electrical Equipment, office & other facilities.

2. Present Energy Consumption & CO_2 Emission:

No	Parameter/ Value	Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	3410	3.07
2	Maximum	519	0.47
3	Minimum	138	0.12
4	Average	284.17	0.26

3. Energy Conservation projects installed:

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

4. Usage of Alternate Energy:

- The College has yet to install Roof Top Solar PV Plant.
- As on today, the % of Usage of Alternate Energy to Total Energy Demand is Nil

5. Usage of LED Lighting:

- The Total Lighting Load of the College is 1.30 kW.
- The Total LED Lighting Load of the College is 2.46 kW.
- The percentage of LED Lighting to Total Lighting Load is 53 %.

6. Assumption:

1. 1 kWh of Electrical Energy releases 0.9 Kg of CO_2 into atmosphere

7. Reference:

- For CO_2 Emissions: www.tatapower.com

ABBREVIATIONS

LED	:	Light Emitting Diode
MSEDCL	:	Maharashtra State Electricity Distribution Company Limited
BEE	:	Bureau of Energy Efficiency
FTL	:	Fluorescent Tube Light
Kg	:	Kilo Gram
kWh	:	kilo-Watt Hour
CO_2	:	Carbon Di Oxide
MT	:	Metric Ton

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study Connected Load
2. To study Present Energy Consumption
3. To Study the present CO_2 emissions
4. To study usage of Alternate Energy
5. To study usage of LED Lighting

1.2 Table No 1: General Details of the College:

No	Head	Particulars
1	Name of Institution	Pragnya Education Trust's Pragnya College of Management & Computer Studies,
2	Address	S. No. 26/1/1, Handewadi Chowk, Hadapsar, Pune 412 308
3	Affiliation	Savitribai Phule Pune University

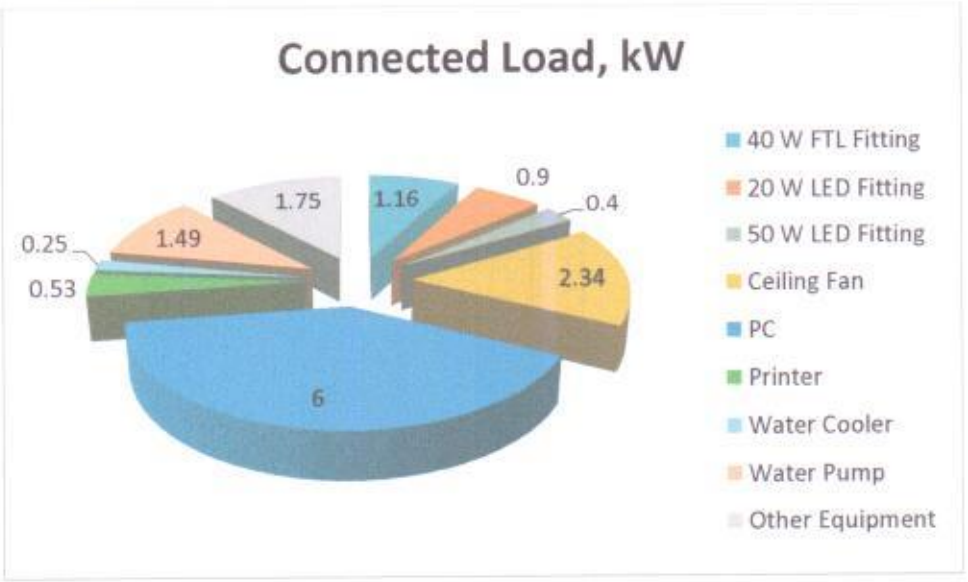
CHAPTER-II
STUDY OF CONNECTED LOAD

The major contributors to the connected load of the College are as under.

Table No 2: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	40 W FTL Fitting	29	40	1.16
2	20 W LED Fitting	45	20	0.9
3	50 W LED Fitting	8	50	0.4
4	Ceiling Fan	36	65	2.34
5	PC	40	150	6
6	Printer	3	175	0.53
7	Water Cooler	1	250	0.25
8	Water Pump	1	1492	1.49
9	Other Equipment	10	175	1.75
10	**Total**			**15**

Chart No 1: Study of Connected Load:



CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Electrical Energy Consumption.

Table No 3: Electrical Energy Consumption Analysis- 2021-22:

No	Month	Energy Consumed, kWh
1	Apr-21	216
2	May-21	138
3	Jun-21	177
4	Jul-21	210
5	Aug-21	200
6	Sep-21	225
7	Oct-21	237
8	Nov-21	345
9	Dec-21	366
10	Jan-22	376
11	Feb-22	401
12	Mar-22	519
13	Total	3410
14	Maximum	519
15	Minimum	138
16	Average	284.17

Chart No 2: Variation in Monthly Energy Consumption:

Table No 4: Variation in Important Parameters:

No	Parameter/ Variation	Energy Consumed, kWh
1	Total	3410
2	Maximum	519
3	Minimum	138
4	Average	284.17

CHAPTER-IV
CARBON FOOT PRINTING

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by taking into account the usage of the Electrical Energy.

Basis for computation of CO_2 Emissions:

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

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the College due to its Day to Day operations

Table No 5: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Apr-21	216	0.19
2	May-21	138	0.12
3	Jun-21	177	0.16
4	Jul-21	210	0.19
5	Aug-21	200	0.18
6	Sep-21	225	0.20
7	Oct-21	237	0.21
8	Nov-21	345	0.31
9	Dec-21	366	0.33
10	Jan-22	376	0.34
11	Feb-22	401	0.36
12	Mar-22	519	0.47
13	Total	3410	3.07
14	Maximum	519	0.47
15	Minimum	138	0.12
16	Average	284.17	0.26

Chart No 3: Month wise CO_2 Emissions:

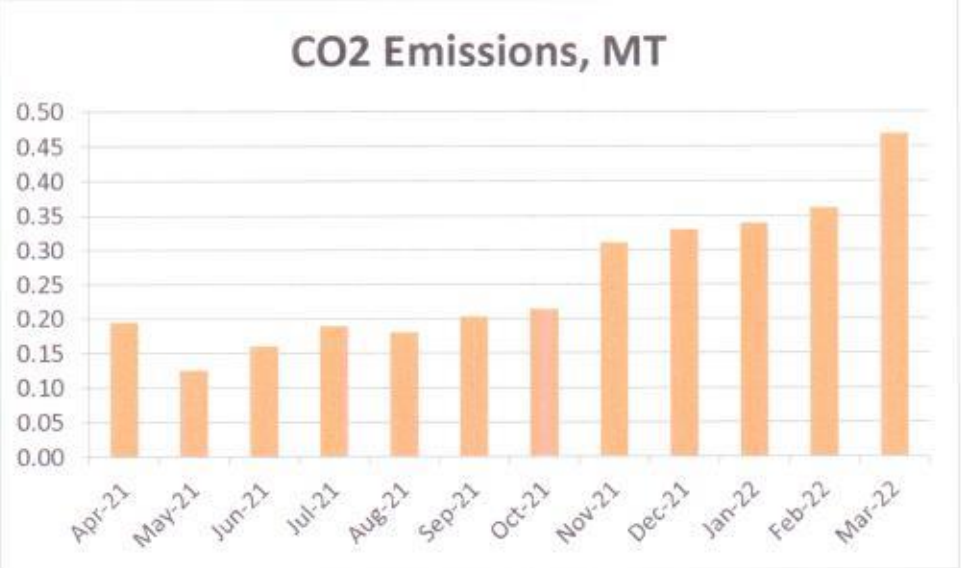


Table No 6: Important Parameters:

No	Parameter/ Variation	Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	3410	3.07
2	Maximum	519	0.47
3	Minimum	138	0.12
4	Average	284.17	0.26

CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

The College has yet to install Roof Top Solar PV Plant.

As on today, the % of Usage of Alternate Energy to Total Energy Demand is Nil

CHAPTER VI
STUDY OF USAGE OF LED LIGHTING

In this chapter, we compute the percentage of usage of LED Lighting to Annual Lighting power requirement.

Table No 7: Percentage of Usage of LED Lighting to Annual Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W LED Fittings	29	Nos
2	Load of 40 W LED Fitting	40	W/unit
3	Total Load of 40 W LED Fittings	**1.16**	kW
4	No of 20 W LED Fittings	45	Nos
5	Load of 20 W LED Fitting	20	W/unit
6	Total Load of 20 W LED Fittings	**0.9**	kW
7	No of 50 W LED Fittings	8	Nos
8	Load of 50 W LED Fitting	50	W/unit
9	Total Load of 50 W LED Fittings	**0.4**	kW
10	Total LED Lighting Load= 6+9	**1.30**	kW
11	Total Lighting Load=3+6+9	**2.46**	kW
12	**% of LEDs to Total Lighting Load=10*100/11**	**53**	%

GREEN AUDIT REPORT

of

Pragnya Education Trust's,

PRAGNYA COLLEGE OF MANAGEMENT & COMPUTER STUDIES,

S. No. 26/1/1, Handewadi Chowk, Hadapsar, Pune 412 308

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: 020-35800450
Email: ecc@mahaurja.com, Web: www.mahaurja.com

MEDA/ECN/2022-23/CR/43/1709 10th May, 2022

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

Registration Number : *MEDA/ECN/2022-23/Class A/EA-42.*

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- 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 (ECC)

ASSOCHAM

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 Muktangan English School, Parvati, Pune 411 009
Tel: 09890444795 Email: engress123@gmail.com

Ref: ES/ PETPCOMCS /21-22/02 Date: 15/6/2022

CERTIFICATE

This is to certify that we have conducted Green Audit at Pragnya Education Trust's Pragnya College of Management & Computer Studies, S. No. 26/1/1, Handewadi Chowk, Hadapsar, Pune 412 308 in the Year 2021-22.

The College has adopted following Green practices:

- Usage of Energy Efficient LED Fittings
- Maximum Usage of Day Lighting
- Segregation of Waste at source
- Maintenance of good internal road in the campus
- Tree Plantation in the campus
- Creation of awareness on Resource Conservation by Display of Posters
- Tree Plantation Drive in the Campus

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

For Engress Services,

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

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ACKNOWLEDGEMENT

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

EXECUTIVE SUMMARY

1. Pragnya Education Trust's Pragnya College of Management & Computer Studies, S. No. 26/1/1, Handewadi Chowk, Hadapsar, Pune 412 308 consumes Energy in the form of Electrical Energy; used for various gadgets, Office & other facilities.

2. Present Energy Consumption & CO_2 Emission:

No	Parameter/ Value	Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	3410	3.07
2	Maximum	519	0.47
3	Minimum	138	0.12
4	Average	284.17	0.26

3. Waste Management:

3.1 Segregation of Waste at Source:

The Dry and Wet waste is segregated at the source and is handed over to Authorized Agency for further action.

3.2 E Waste Management:

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

3.3 Sanitary Waste Management:

It is recommended to dispose of the Sanitary Waste in a Sanitary Waste Incinerator.

4. Rain Water Management:

The College has yet to implement the Rain Water Management Project.

5. Green & Sustainable Practices:

- Good internal road for easy movement of commuters
- Internal tree plantation
- Creation of Awareness by Display of Posters on Resource Conservation
- Tree Plantation Drive in the campus

6. Assumption:

1. 1 kWh of Electrical Energy releases 0.9 Kg of CO_2 into atmosphere

7. Reference:

- For CO_2 Emission Computation: www.tatapower.com

ABBREVIATIONS

LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
MT	:	Metric Ton
CO_2	:	Carbon Di Oxide

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study present Energy Consumption
2. To compute CO_2 emissions
3. To Study Usage of Renewable Energy
4. To Study Waste Management Practices
5. To Study Rain Water Harvesting
6. To Study Green & Sustainable Initiatives

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name of Institution	Pragnya Education Trust's Pragnya College of Management & Computer Studies
2	Address	S. No. 26/1/1, Handewadi Chowk, Hadapsar, Pune 412 308
3	Affiliation	Savitribai Phule Pune University

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

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

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

No	Month	Energy Consumed, kWh
1	Apr-21	216
2	May-21	138
3	Jun-21	177
4	Jul-21	210
5	Aug-21	200
6	Sep-21	225
7	Oct-21	237
8	Nov-21	345
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11	Feb-22	401
12	Mar-22	519
13	Total	3410
14	Maximum	519
15	Minimum	138
16	Average	284.17

Chart No 1: To study the variation of Monthly Energy Consumption, kWh:

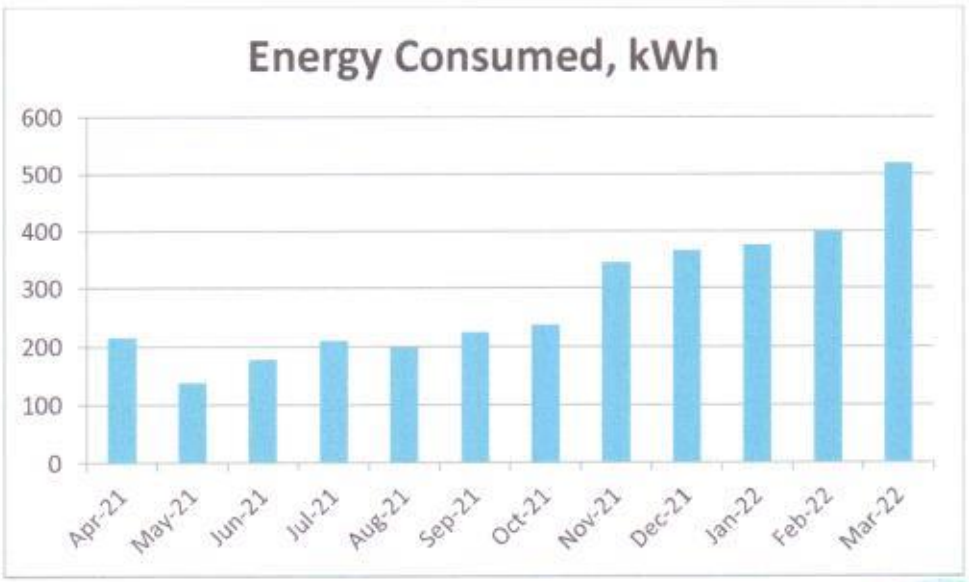

Table No 3: Various Important Parameters:

No	Parameter/ Value	Energy Consumed, kWh
1	Total	3410
2	Maximum	519
3	Minimum	138
4	Average	284.17

CHAPTER III
CARBON FOOTPRINTING

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities. The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere.

Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Apr-21	216	0.19
2	May-21	138	0.12
3	Jun-21	177	0.16
4	Jul-21	210	0.19
5	Aug-21	200	0.18
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16	Average	284.17	0.26

Chart No 2: Representation of Month wise CO_2 Emissions:

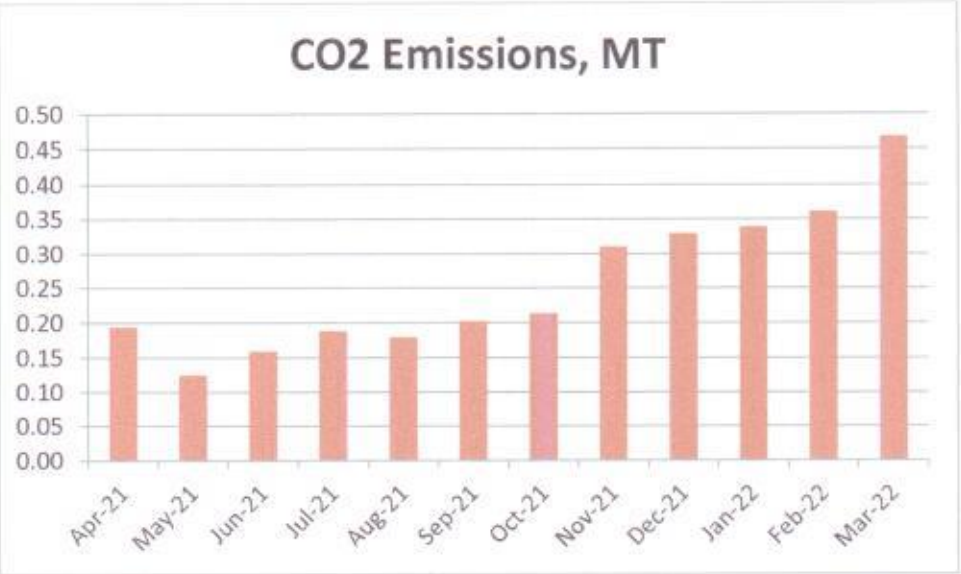


Table No 5: Various Important Parameters:

No	Parameter/ Value	Energy consumed, kWh	CO_2 Emissions, MT
1	Total	3410	3.07
2	Maximum	519	0.47
3	Minimum	138	0.12
4	Average	284.17	0.26

CHAPTER IV
STUDY OF USAGE OF RENEWABLE ENERGY

The College has yet to install Roof Top Solar PV Plant.

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Solid Waste Management:

The Waste is segregated at source and is handed over to Agency for further action.

Photograph of Waste Collection Bin:

5.2 Sanitary Waste Management:

It is recommended to dispose of the Sanitary Waste in a 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 College has yet to implement the Rain water Management Project.

CHAPTER VI
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads:

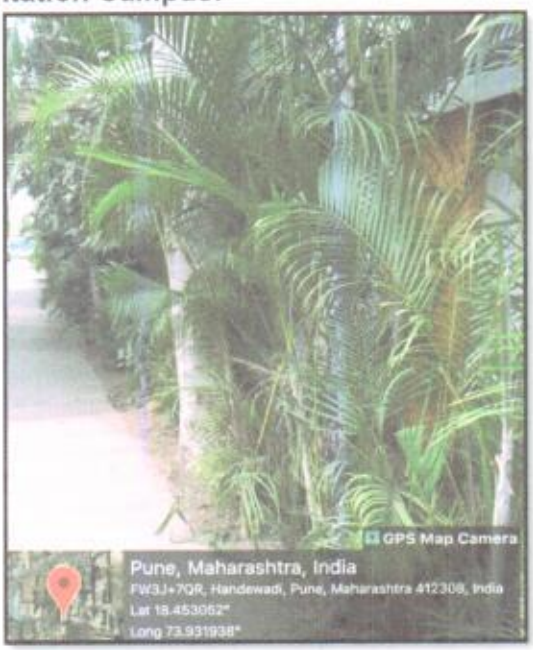
The College has well maintained internal roads to facilitate the easy movement of the students within the campus.

Photograph of Internal Road inside the College Campus:

7.2 Internal Tree Plantation:

The College has well maintained Tree Plantation in the campus.

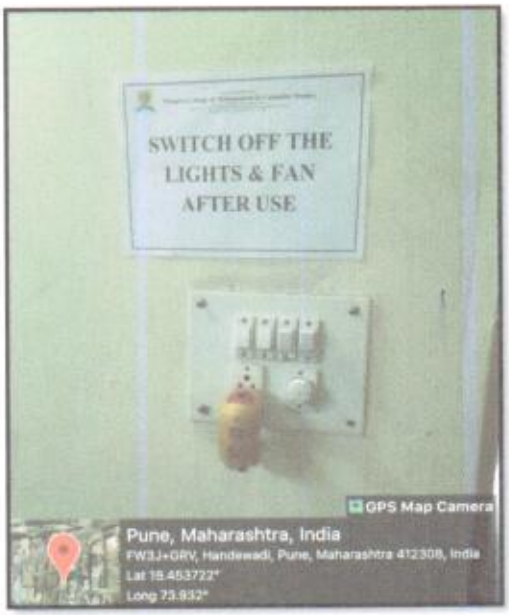
Photograph of Tree Plantation Campus:



7.3 Creation of Awareness about Resource Conservation:

In order to create awareness about Resource Conservation, the College has displayed posters at various locations.

Photograph of Poster on Resource Conservation:



7.4 Tree Plantataion Drive in the Campus:

The College arranged a Tree Plantation Drive in the Campus.

Photograph of Tree Plantation Event:

ANNEXURE-I
DETAILS OF TREES AND PLANTS IN THE CAMPUS

List of Trees:

No	Common Name Of Tree/Plant	Qty
1	Palm	80
2	Ficus	3
3	Areca Palm	4

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Ref: ES/ PETPCOMCS /21-22/03

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The College has adopted Environment Friendly practices:

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- Maximum Usage of Day Lighting
- Segregation of Waste at source
- Tree Plantation in the campus
- Creation of awareness on Resource Conservation by Display of Posters
- Tree Plantation Drive in the Campus

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

For Engress Services,

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

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2. Pollution caused due to College 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. Present Energy Consumption & CO_2 Emission:

No	Parameter/ Value	Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	3410	3.07
2	Maximum	519	0.47
3	Minimum	138	0.12
4	Average	284.17	0.26

4. Usage of Renewable Energy & CO_2 Emission Reduction:

The College has yet to install the Roof Top Solar PV Plant.

5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	81	49	60
2	Minimum	60	36	38

6. Indoor Comfort Condition Parameters:

No	Parameter/Value	Temperature, ^0C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	27.3	58	160	45
2	Minimum	26.9	56	103	41

7. Waste Management:

7.1 Segregation of Waste at Source:

The Dry and Wet waste is segregated at the source and is handed over to Authorized Agency for further action.

7.2 E Waste Management:

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

7.3 Sanitary Waste Management:

It is recommended to dispose of the Sanitary Waste in a Sanitary Waste Incinerator.

8. Rain Water Management:

The College has yet to implement the Rain Water Management Project.

9. Eco Friendly Initiatives:

- Internal tree plantation in the campus
- Creation of Awareness by Display of Posters on Resource Conservation
- Tree Plantation Drive in the campus

10. Assumption:

1. 1 kWh of Electrical Energy releases 0.9 Kg of CO_2 into atmosphere

11. References:

1. For Various Indoor Air Parameters: www.ishrae.com
2. For AQI & Water Quality Standards: www.cpcb.com
3. For CO_2 calculations: www.tatapower.com

ABBREVIATIONS

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 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. Table No 1: Relevant Environmental Laws in India:

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

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 (Sitting 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 Table No-3: National Environmental Plans & Policy Documents:

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 Consumption of Resources and CO_2 Emission
2. To Study CO_2 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 Management
7. To study Eco Friendly Initiatives

1.3 Table No 4: General Details of College:

No	Head	Particulars
1	Name of Institution	Pragnya Education Trust's Pragnya College of Management & Computer Studies
2	Address	S. No. 26/1/1, Handewadi Chowk, Hadapsar, Pune 412 308
3	Affiliation	Savitribai Phule Pune University

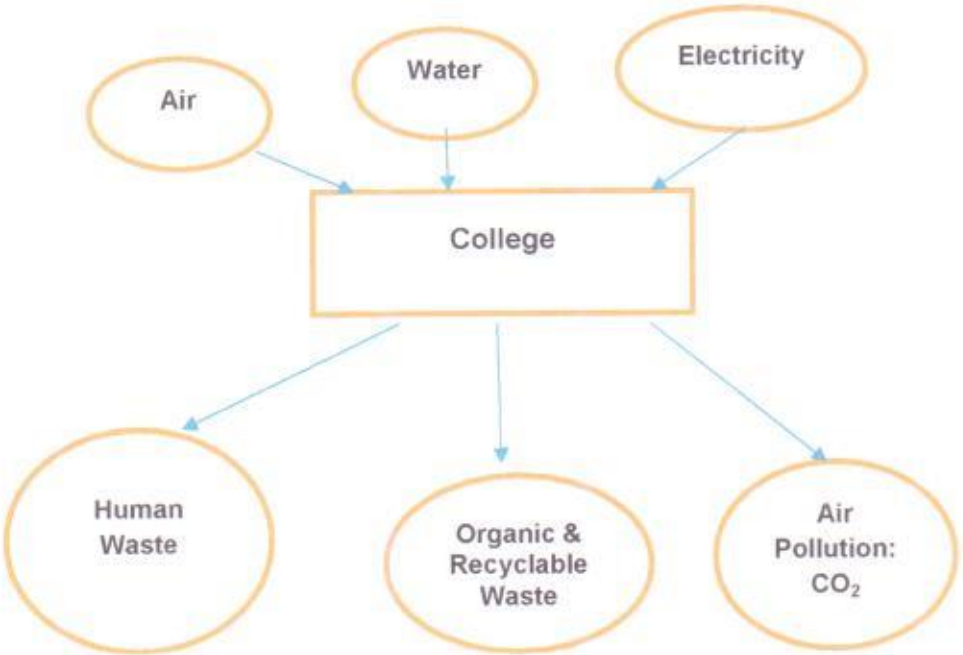
CHAPTER-II
STUDY OF RESOURCE CONSUMPTION & CO2 EMISSION

2.1 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.

2.2 Chart No: 1: Representation of College as System:



We compute the Generation of CO_2 on account of consumption of Electrical Energy as under.

Table No 5: To study Energy Consumption and CO_2 Emission: 21-22:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Apr-21	216	0.19
2	May-21	138	0.12
3	Jun-21	177	0.16
4	Jul-21	210	0.19
5	Aug-21	200	0.18
6	Sep-21	225	0.20

7	Oct-21	237	0.21
8	Nov-21	345	0.31
9	Dec-21	366	0.33
10	Jan-22	376	0.34
11	Feb-22	401	0.36
12	Mar-22	519	0.47
13	Total	3410	3.07
14	Maximum	519	0.47
15	Minimum	138	0.12
16	Average	284.17	0.26

Chart No 2: To study the variation in CO_2 Emissions, MT:

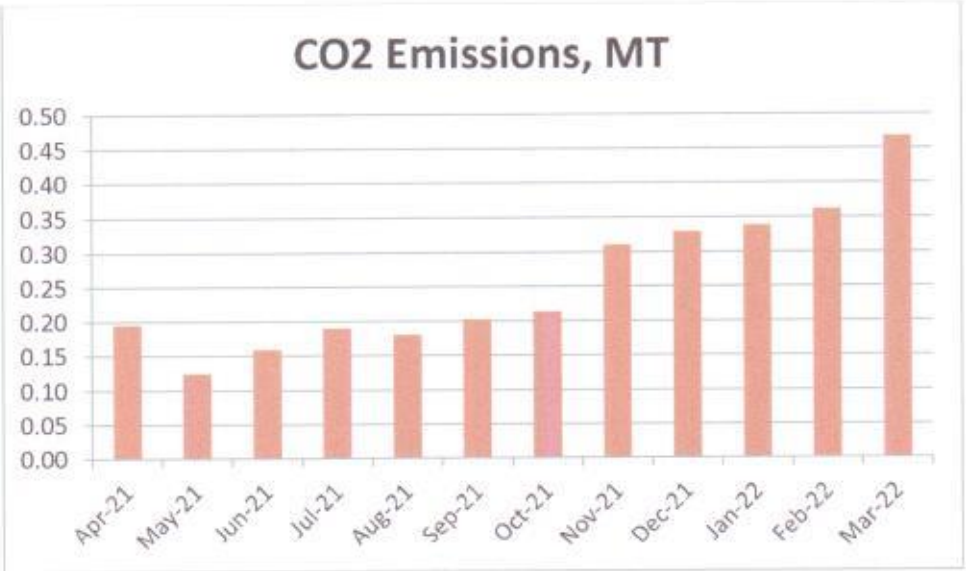


Table No 6: Various Important Parameters:

No	Parameter/ Value	Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	3410	3.07
2	Maximum	519	0.47
3	Minimum	138	0.12
4	Average	284.17	0.26

CHAPTER III
STUDY OF USAGE OF RENEWABL ENERGY

The College 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.

Table No 7: Indoor Air Quality Parameters:

No	Location	AQI	PM2.5	PM10
	Ground Floor			
1	Director Cabin	75	45	60
2	Principal Cabin	76	46	52
3	Staff Room	73	43	47
4	Front Office	81	49	60

	First Floor			
5	Classroom103	75	45	56
6	Electronic Lab	70	43	49
7	Computer Lab-I	66	39	42
8	R-101	68	43	57
	Second Floor			
9	R-203	65	39	46
10	Classroom-8	71	42	49
11	Library	68	38	44
12	R-202	66	39	46
	Third Floor			
13	R-301	63	38	42
14	Classroom	60	36	38
15	Classroom	68	41	48
16	Lab	67	39	44
	Maximum	**81**	**49**	**60**
	Minimum	**60**	**36**	**38**

CHAPTER V
STUDY OF INDOOR COMFORT CONDITION

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	Director Cabin	27.2	56	103	43
2	Principal Cabin	27.3	56	132	42.6
3	Staff Room	27.2	57	124	41.6
4	Front Office	26.9	58	154	41.9
	First Floor				
5	Classroom103	26.9	58	140	42.2
6	Electronic Lab	26.9	58	136	42.6
7	Computer Lab-I	27	56	126	45
8	R-101	27.2	56	139	43.9
	Second Floor				
9	R-203	27.2	56	127	44
10	Classroom-8	27.1	57	147	42.6
11	Library	27.1	58	136	45
12	R-202	27.1	58	147	41.8
	Third Floor				
13	R-301	27	58	142	41
14	Classroom	27	58	160	41.9
15	Classroom	27.1	58	134	41.6
16	Lab	27.2	57	152	42.8
	Maximum	**27.3**	**58**	**160**	**45**
	Minimum	**26.9**	**56**	**103**	**41**

CHAPTER VI
STUDY OF WASTE MANAGEMENT

6.1 Solid Waste Management:

The Waste is segregated at source and is handed over to Agency for further action.

Photograph of Waste Collection Bin:

6.2 Sanitary Waste Management:

It is recommended to dispose of the Sanitary Waste in a Sanitary Waste Incinerator.

6.3 E Waste Management:

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

CHAPTER VII
STUDY OF RAIN WATER MANAGEMENT

The College has yet to implement the Rain Water Management Project.

CHAPTER VIII
STUDY OF ENVIRONMENT FRIENDLY INITIATIVES

8.1 Internal Tree Plantation:

The College has well maintained Tree Plantation in the campus.

Photograph of Tree Plantation Campus:

8.2 Creation of Awareness about Resource Conservation:

In order to create awareness about Resource Conservation, the College has displayed posters at various locations.

Photograph of Poster on Resource Conservation:

8.3 Tree Plantataion Drive in the Campus:

The College arranged a Tree Plantation Drive in the Campus.

Photograph of Tree Plantation Event:

ANNEXURE: 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 $33^{0}C$
2	Humidity	Less Than 70%