Metric No.7.1.3 Quality Audits on Environment and Energy

Index

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

Policy Document on Environment and Energy Usage

The college is committed to managing energy systematically to minimize its environmental impact. Our policy focuses on exploring renewable energy resources to alleviate government burdens and discover alternative natural solutions to the energy crisis. This policy is applicable to all institutional components, stakeholders, and activities, aiming to embed efficiency and environmental awareness in our daily operations. Our Trust plays a pivotal role in fostering environmental awareness through green initiatives programs to save energy and protect the environment.

Policies:

1. Assess our energy usage and measure its environmental impact.
2. Monitor CO2 emissions from transportation vehicles.
3. Reduce local air pollution by promoting environment-friendly vehicles, bicycles, public transportation, and pedestrian-friendly roads.
4. Install LED bulbs on campus to conserve energy.
5. Develop a systematic waste management mechanism.
6. Implement a rainwater harvesting unit.
7. Conduct tree plantation drives.
8. Continuously improve our energy consumption practices.
9. Maintain an Environmental Management System and an Energy Management System.
10. Ensure the availability of necessary resources to achieve our objectives.
11. Encourage the use of advanced technology to minimize energy consumption, atmospheric emissions, and noise, especially from vehicle fleets.
12. Engage in dialogue with government agencies, municipal corporations, and the affiliating university, and collaborate with local organizations on environmental and energy efficiency initiatives.
13. Monitor and respond to emerging environmental and energy issues.
14. Enhance the environmental knowledge and skills of our employees and students to improve our environmental performance.
15. Provide information and training on energy-saving measures.
16. Offer opportunities for employees and students to engage in environmental protection initiatives.
17. Communicate this policy to students and employees via internal channels and make it available to all stakeholders on the institutional website. The Environment and Energy Policy, along with its objectives and targets, will be reviewed regularly under the guidance of the Principal of the college.

BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Muktangan English School,
Parvati, Pune 411 009 Tel: 09890444795 Email: engress123@gmail.com
UDYAM Regn. No: UDYAM-MH-26-0135636,
MEDA Regn. No: ECN/2023-24/CR-43/1709
ISO: 9001-2015 Certified (Cert No: 23EQKC13),
ISO: 14001-2015 Certified (Cert No: 23EEKW20)

Certificate No: ES/DACC/23-24/01 **Date: 18/7/2024**

This is to certify that we have conducted Energy Audit at Dnyansagar Arts & Commerce College, SKP Campus, Baner-Balewadi Road, Baner, Pune-411045, in the Academic Year 2023-24.

The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting
- Installation of 5 kWp Roof Top Solar PV Plant

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

For Engress Services,

ENGRESS SERVICES PUNE

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

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

MSME

IAF INTERNATIONAL ACCREDITATION FORUM

EGAC Accredited

ENERGY AUDIT REPORT

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2023-24

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41...

Prepared by:

ENGRESS SERVICES

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

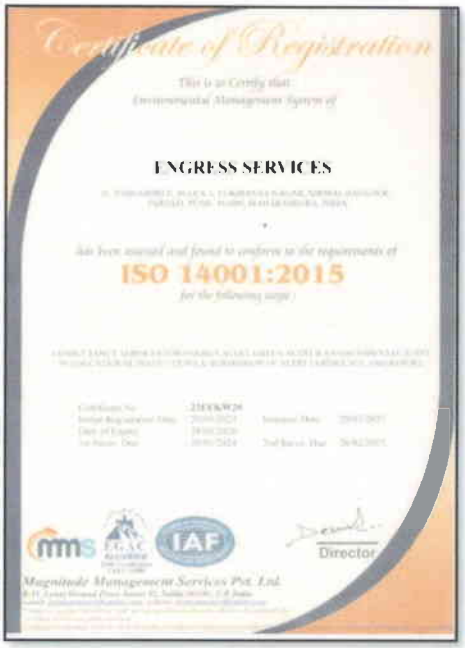
REGISTRATION CERTIFICATES: BEE, UDYAM, MEDA, ISO-9001 & 14001:

Maharashtra Energy Development Agency

CERTIFICATE OF REGISTRATION
FOR CLASS "A"

National Productivity Council
(National Certifying Agency)
PROVISIONAL CERTIFICATE

This is to certify that Mr. / Ms. Achyut Yashavant Mehendale
son / daughter of Mr. Yashavant
has passed the National Certification Examination for Energy Auditors on April - 2007, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.



Certificate of Registration

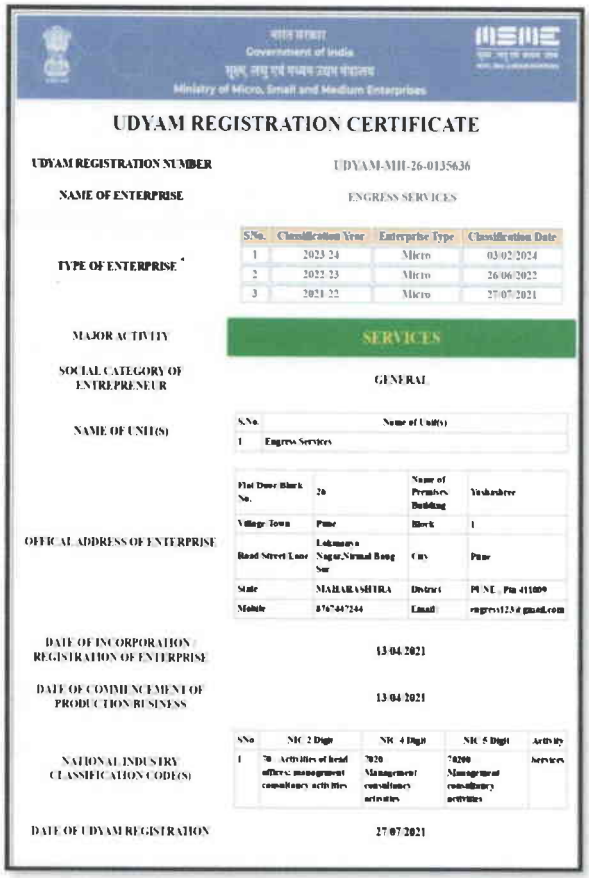
This is to Certify that
Environmental Management System of

ENGRESS SERVICES

has been assessed and found to conform to the requirements of
ISO 14001:2015
for the following scope :

Director

Magnitude Management Services Pvt. Ltd.



भारत सरकार
Government of India
सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
Ministry of Micro, Small and Medium Enterprises

UDYAM REGISTRATION CERTIFICATE

UDYAM REGISTRATION NUMBER	UDYAM-MH-26-0135636
NAME OF ENTERPRISE	ENGRESS SERVICES

TYPE OF ENTERPRISE *

S.No.	Classification Year	Enterprise Type	Classification Date
1	2023-24	Micro	03/02/2024
2	2022-23	Micro	26/06/2022
3	2021-22	Micro	27/07/2021

MAJOR ACTIVITY: SERVICES

SOCIAL CATEGORY OF ENTREPRENEUR: GENERAL

NAME OF UNIT(S)

S.No.	Name of Unit(s)
1	Engress Services

OFFICIAL ADDRESS OF ENTERPRISE

Flat Door Block No.	26	Name of Premises Building	Yashashree
Village Town	Pune	Block	1
Road Street Lane	Lokmanya Nagar,Nirmal Baug Sar	City	Pune
State	MAHARASHTRA	District	PUNE , Pin 411009
Mobile	8767447244	Email	engress123@gmail.com

DATE OF INCORPORATION / REGISTRATION OF ENTERPRISE: 13/04/2021

DATE OF COMMENCEMENT OF PRODUCTION/BUSINESS: 13/04/2021

NATIONAL INDUSTRY CLASSIFICATION CODE(S)

SNo	NIC 2 Digit	NIC 4 Digit	NIC 5 Digit	Activity
1	70 Activities of head offices; management consultancy activities	7020 Management consultancy activities	70200 Management consultancy activities	Services

DATE OF UDYAM REGISTRATION: 27/07/2021

Certificate of Registration

This is to Certify that
Quality Management System of

ENGRESS SERVICES

has been assessed and found to conform to the requirements of
ISO 9001:2015
for the following scope :

Director

Magnitude Management Services Pvt. Ltd.

BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

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Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, for awarding us the assignment of Energy Audit of their Baner campus for the Academic Year: 2023-24.

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

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment.

2. Present Connected Load & Energy Consumption:

No	Particulars	Value	Unit
1	Total Connected Load	**46.50**	kW
2	Annual Energy Purchased	**25260**	kWh

3. Per Capita Energy Consumption Index:

No	Particulars	Value	Unit
1	Total Annual Energy Purchased	25260	kWh
2	Energy Generated by Solar PV Plant	6000	kWh
3	Total Energy Consumed= 1+2	31260	kWh
4	Total No of Students	**327**	Nos
5	Per Capita Energy Consumption = **(3) / (4)**	**95.60**	kWh/Annum

4. Study of % Usage of LED Lighting:

No	Particulars	Value	Unit
1	% of Usage of LED Lighting to Total Lighting Load	**100**	%

5. Renewable Energy & Energy Efficiency Projects:

- Usage of Energy Efficient LED fittings
- Installation of **5 kWp** Roof Top Solar PV Plant

6. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.93 Kg** of CO_2 into atmosphere
2. Energy consumption is computed based on Load Utilization Factor
3. CO_2 Emissions are based on Electrical Energy purchased
4. **1 kWp** Solar PV system generates **4 kWh** of Electrical Energy per Day
5. Annual Solar Energy Generation Days: **300 Nos**

7. References:

- Audit Methodology: www.mahaurja.com
- Energy Conservation Building Code: ECBC-2017: www.beeindia.gov.in
- For CO_2 Emissions: www.ccd.gujarat.gov.in
- For Solar PV Energy Generation: www.rooftopsolar.gov.in

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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ABBREVIATIONS

LED	:	Light Emitting Diode
MSEDCL	:	Maharashtra State Electricity Distribution Company Limited
BEE	:	Bureau of Energy Efficiency
ECBC	:	Energy Conservation Building Code
MEDA	:	Maharashtra Energy Development Agency
PV	:	Photo Voltaic
Kg	:	Kilo Gram
kWh	:	kilo-Watt Hour
CO_2	:	Carbon Di Oxide
MT	:	Metric Ton

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-I
INTRODUCTION

1.1 Introduction:

An Energy Audit is conducted at Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune

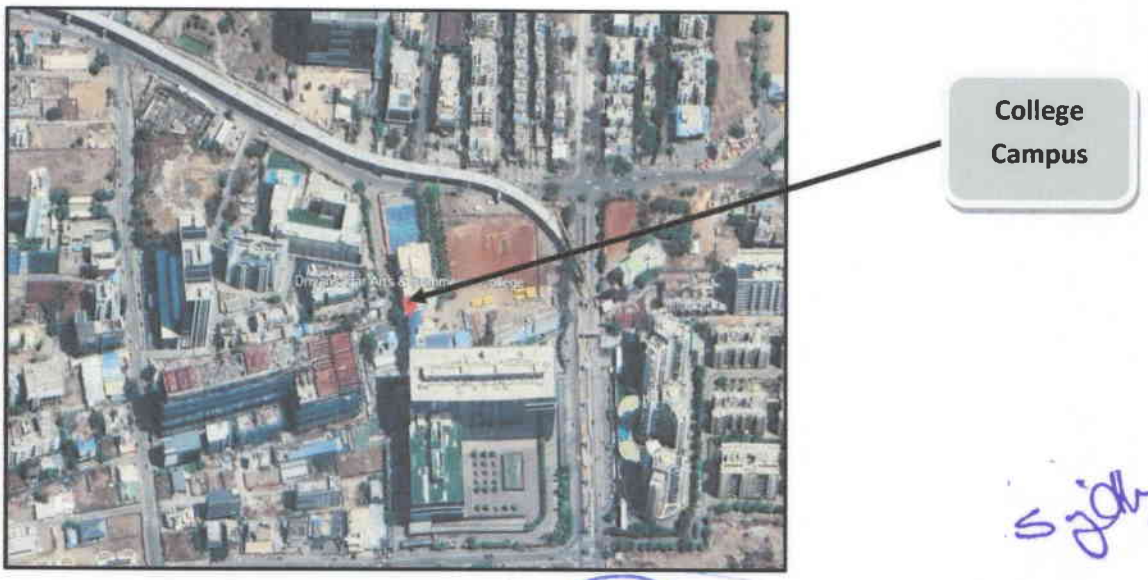
The guidelines followed for conducting the Energy Audit are:

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

1.2 Key Study Points:

No	Particulars
1	Study of Present Connected Load
2	Study of Present Energy Consumption
3	Study of Per Capita Energy Consumption
4	Study of Lighting
5	Study of Energy Efficiency & Renewable Energy

1.3 College Location Image:



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Principal
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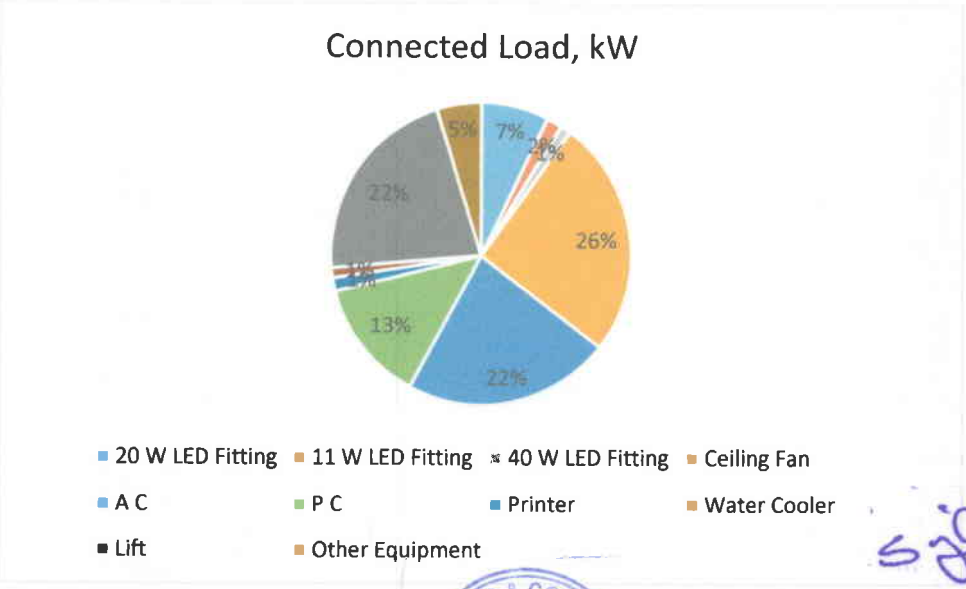
CHAPTER-II
STUDY OF CONNECTED LOAD

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

Table No 1: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load/unit	Load, kW
1	20 W LED Fitting	168	20	3.36
2	11 W LED Fitting	70	11	0.77
3	40 W LED Fitting	13	40	0.52
4	Ceiling Fan	183	65	11.90
5	A C	6	1725	10.35
6	P C	41	150	6.15
7	Printer	4	175	0.7
8	Water Cooler	2	250	0.5
9	Lift	1	10000	10
10	Other Equipment	15	150	2.25
11	**Total**			**46.50**

Chart No 1: Study of Connected Load:



DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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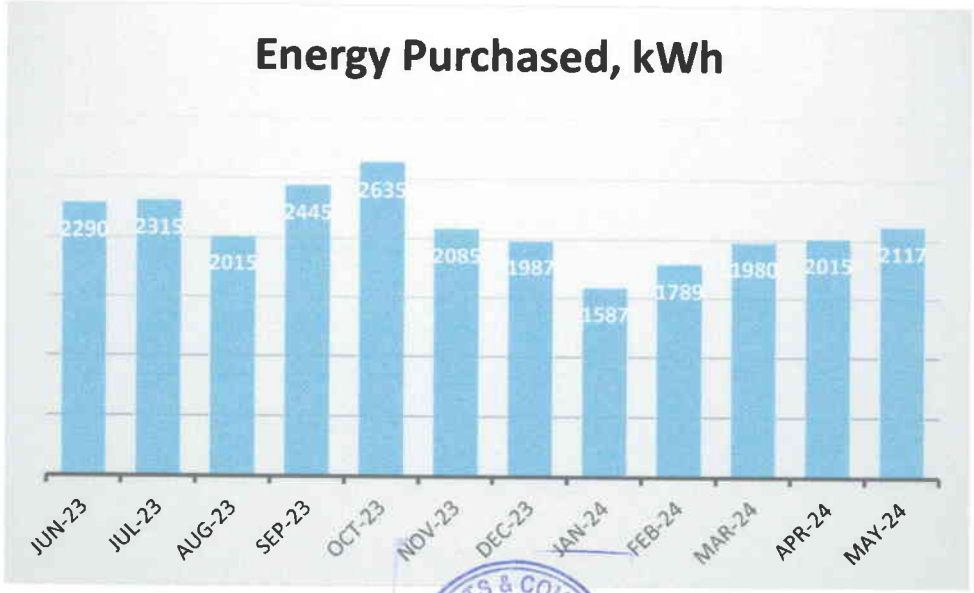
CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Electrical Energy Consumption Analysis- 2023-24:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Jun-23	2290	2.13
2	Jul-23	2315	2.15
3	Aug-23	2015	1.87
4	Sep-23	2445	2.27
5	Oct-23	2635	2.45
6	Nov-23	2085	1.94
7	Dec-23	1987	1.85
8	Jan-24	1587	1.48
9	Feb-24	1789	1.66
10	Mar-24	1980	1.84
11	Apr-24	2015	1.87
12	May-24	2117	1.97
13	Total	25260	23.49
14	Maximum	2635	2.45
15	Minimum	1587	1.48
16	Average	2105	1.96

Chart No 2: Variation in Monthly Energy purchased, kWh:



DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Comm
Balewadi, Pune-411045.

CHAPTER-IV
STUDY OF PER CAPITA ENERGY CONSUMPTION

Per Capita Energy Consumption Index: Per Capita Energy Consumption Index of an educational College/College is its Annual Energy Consumption in Kilo Watt Hours per student studying in the Institution.

It is determined by:

$$\text{Per Capita Energy Consumption Index} = \frac{\text{(Annual Energy Consumption in kWh)}}{\text{(Total No of students studying)}}$$

Now we compute the Per Capita Energy Consumption for the College as under:

Table No 3: Computation of Per Capita Energy Consumption:

No	Particulars	Value	Unit
1	Total Annual Energy Purchased	25260	kWh
2	Energy Generated by Solar PV Plant	6000	kWh
3	Total Energy Consumed= 1+2	31260	kWh
4	Total No of students	**327**	Nos
5	Per Capita Energy Consumption = **(3) / (4)**	**95.60**	kWh/Annum

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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 (lux/W/m²)

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 (lm/W)

6. 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 College.

Percentage Usage of LED Lighting to Total Lighting Load:

- The Total Lighting Load of the College is **4.65 kW**
- All the Light Fittings are LEDs
- % of Usage of LEDs to Total Lighting Load is **100 %**

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

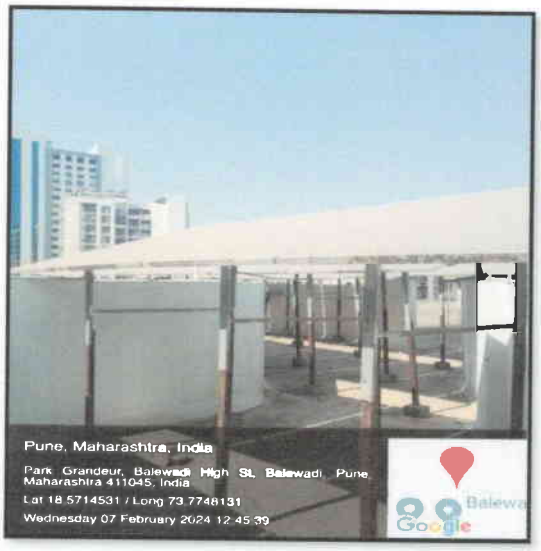
CHAPTER-VI
STUDY OF RENEWABLE ENERGY & ENERGY EFFICIENCY

6.1 Usage of Renewable Energy:

The College has installed:

- Roof Top Solar PV Plant of Capacity **10 kWp**

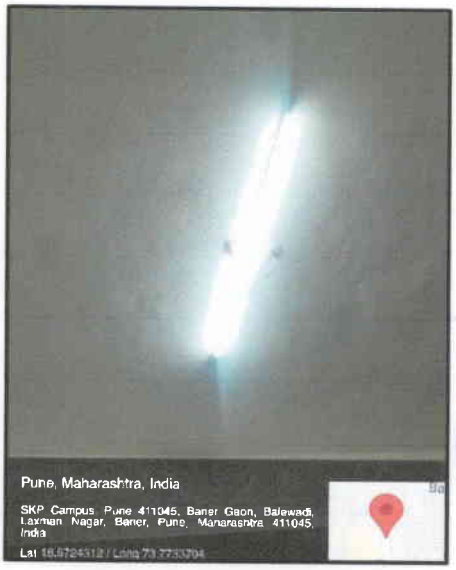
Photograph of Roof Top Solar PV Plant:



6.2 Energy Efficiency Measures adopted:

The College has Energy Efficient LED Fittings & STAR Rated Fridge

- **Photographs of LED Lighting & STAR Rated Fridge:**



DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ENGRESS SERVICES

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

ENERGY AUDIT CERTIFICATE

Certificate No: ES/DACC/22-23/01 **Date: 13/7/2023**

This is to certify that we have conducted Energy Audit at, Dnyansagar Arts & Commerce College, SKP Campus, Baner-Balewadi Road, Baner, Pune-411045, in the Academic year 2022-23.

The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting
- Installation of 5 kWp Roof Top Solar PV Plant

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

For Engress Services,

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

ENGRESS SERVICES * PUNE *

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ENERGY AUDIT REPORT

Of

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2022-23

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

Prepared by

ENGRESS SERVICES

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

ENGRESS SERVICES PUNE

REGISTRATION CERTIFICATES

Regn. No. EA-8192 No. 2942

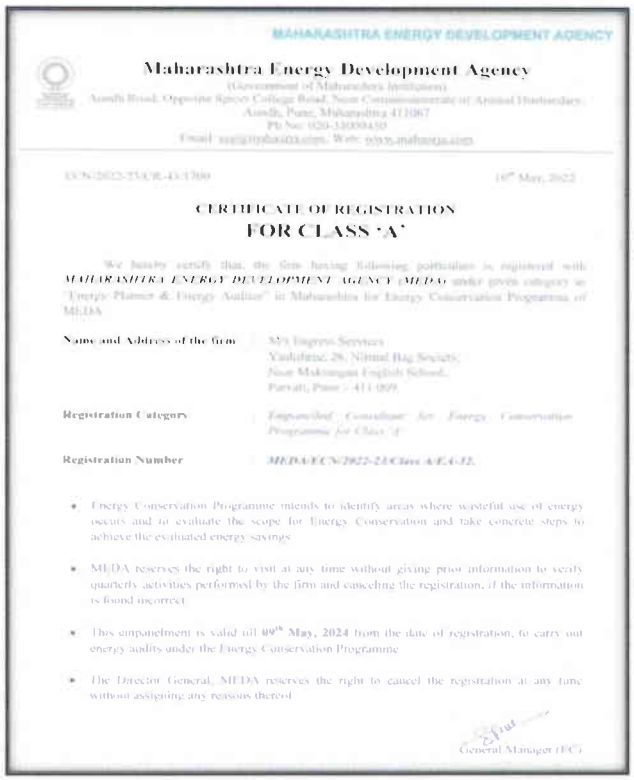
National Productivity Council
(National Certifying Agency)
PROVISIONAL CERTIFICATE

This is to certify that Mr / Ms Achyut Yashavant Mehendale
son / daughter of Mr Yashavant
has passed the National Certification Examination for Energy Auditors in April - 2002, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.
He / She is qualified to Certified Energy Manager as well as Certified Energy Auditor.
He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.
This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India
Date : 10th August 2002

Controller of Examination

AUDITOR CERTIFICATE



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 411007
Ph No: 020-33000450
Email: [illegible], Web: www.mahaurja.com

MEDA/2022-23/CR-43/1300 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
Vashishree, 26, Nirmal Bag Society,
Near Maharajpur 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)

MEDA Registration Certificate

Certificate of Registration

This is to Certify that
Quality Management System of

ENGRESS SERVICES

has been assessed and found to conform to the requirements of
ISO 9001:2015
for the following scope :

Certificate No. 21EQSC13
Initial Registration Date 27/02/2015 Issuance Date 27/02/2021
Date of Expiry 26/02/2024
1st Survey Due 27/02/2022 2nd Survey Due 27/02/2023

Director

Magnitude Management Services Pvt. Ltd.

ISO: 9001-2015 Certificate

Certificate of Registration

This is to Certify that
Environmental Management System of

ENGRESS SERVICES

has been assessed and found to conform to the requirements of
ISO 14001:2015
for the following scope :

Certificate No. 21EEMS20
Initial Registration Date 29/02/2012 Issuance Date 28/02/2021
Date of Expiry 28/02/2024
1st Survey Due 29/02/2020 2nd Survey Due 29/02/2021

Director

Magnitude Management Services Pvt. Ltd.

ISO: 14001-2015 Certificate

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
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ACKNOWLEDGEMENT

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

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
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EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment.

2. Present Connected Load & Energy Consumption:

No	Particulars	Value	Unit
1	Total Connected Load	**46.27**	kW
2	Annual Energy Purchased	**24447**	kWh

3. Energy Performance Index:

No	Particulars	Value	Unit
1	Total Annual Energy Purchased	**24447**	kWh
2	Energy Generated by Solar PV Plant	**6000**	kWh
3	Total Energy Consumed = 1+2	**30447**	kWh
4	Total Built up area of College	**2601.28**	m^2
5	Energy Performance Index **=(3) / (4)**	**11.70**	kWh/m^2

4. Study of Lighting Power Density & % Usage of LED Lighting:

No	Particulars	Value	Unit
1	Lighting Power Density	**1.68**	W/m^2
2	% of Usage of LED Lighting to Total Lighting Load	**100**	%

5. Renewable Energy & Energy Efficiency Projects:

- Usage of Energy Efficient LED fittings
- Installation of **5 kWp** Roof Top Solar PV Plant

6. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2 into atmosphere
2. Energy generated by Roof Top Solar PV Plant: **4 kWh/kWp per Day**
3. Annual Solar Energy Generation Days: **300 Nos**
4. Energy Consumption is computed on the basis of Load Utilization Factor

7. References:

- Audit Methodology: www.mahaurja.com
- Energy Conservation Building Code: ECBC-2017: www.beeindia.gov.in
- For CO_2 Emissions: www.tatapower.com
- For Solar PV Energy generation: www.solarrooftop.gov.in

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune

ABBREVIATIONS

AC	:	Air conditioner
MSEDCL	:	Maharashtra Energy Distribution Company Limited
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
PC	:	Personal Computer
MT	:	Metric Ton

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-I
INTRODUCTION

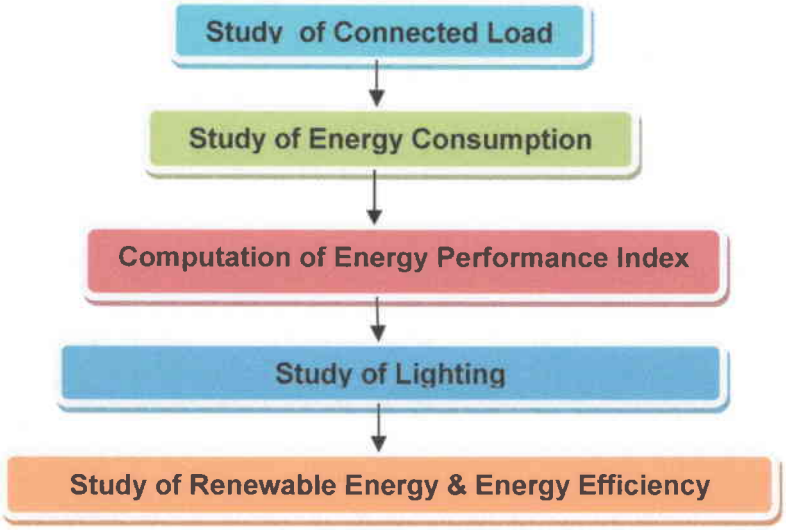
1.1 Introduction:

An Energy Audit is conducted at Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune

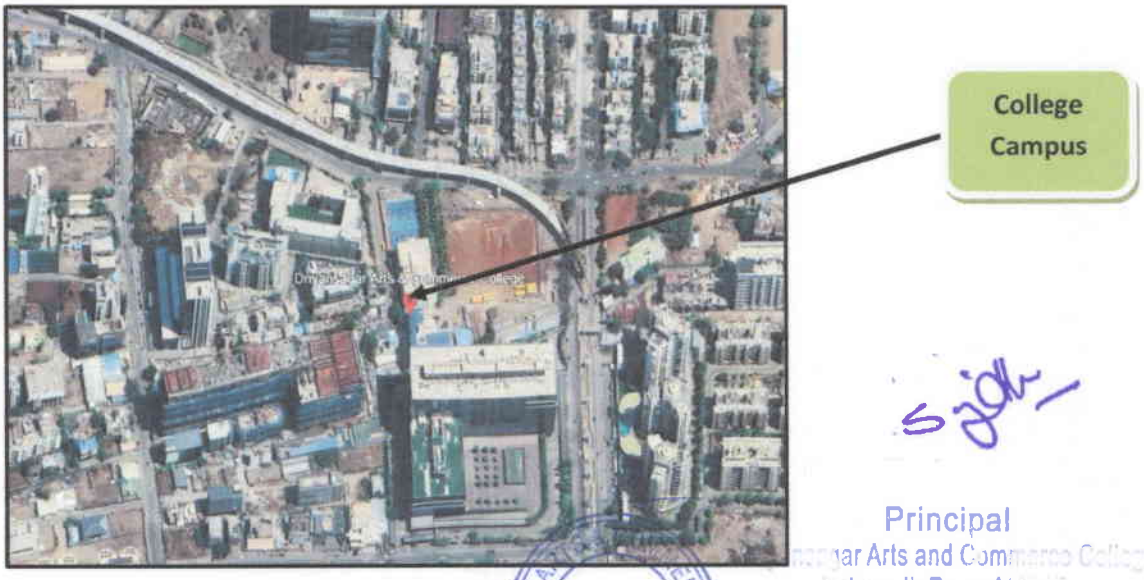
The guidelines followed for conducting the Energy Audit are:

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

1.2 Audit Procedural Steps:



1.3 College Location Image:



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Balewadi, Pune-411045.

BALEWADI PUNE - 45

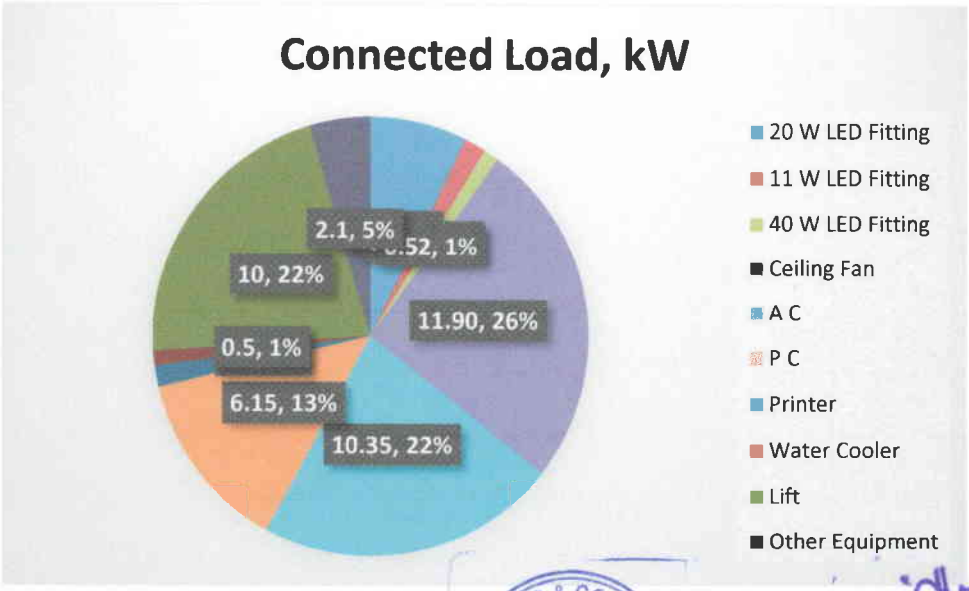
CHAPTER-II
STUDY OF CONNECTED LOAD

In this chapter, we present the details of various Electrical loads as under

Table No 2: Details of Overall Connected Load:

No	Equipment	Qty	Load/unit	Load, kW
1	20 W LED Fitting	165	20	3.3
2	11 W LED Fitting	69	11	0.759
3	40 W LED Fitting	13	40	0.52
4	Ceiling Fan	183	65	11.90
5	A C	6	1725	10.35
6	P C	41	150	6.15
7	Printer	4	175	0.7
8	Water Cooler	2	250	0.5
9	Lift	1	10000	10
10	Other Equipment	14	150	2.1
11	**Total**			**46.27**

Chart No 1: Total Connected Load:



DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune 411...

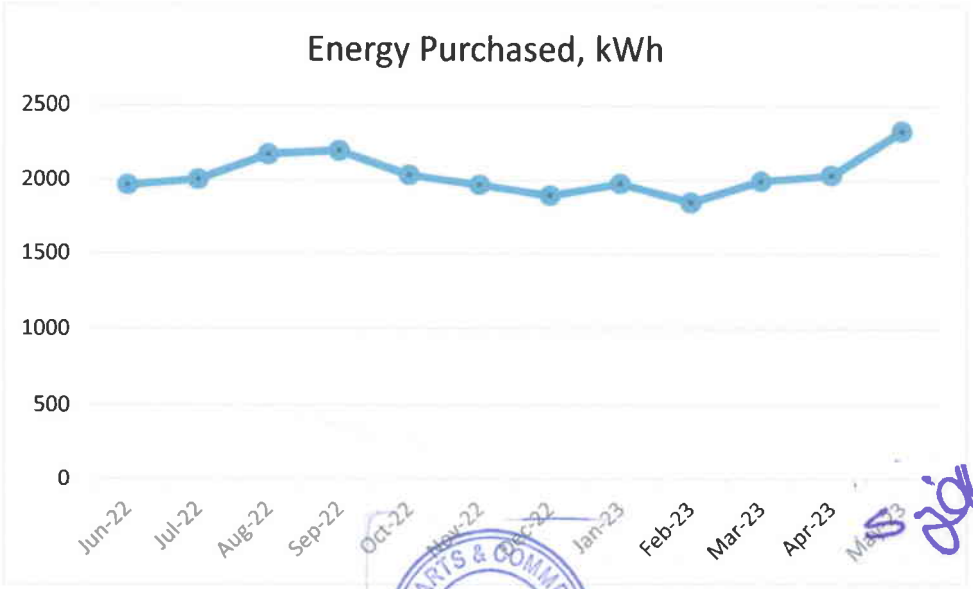
CHAPTER-III
STUDY OF ELECTRICAL ENERGY CONSUMPTION

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

Table No 3: Electrical Bill Analysis- 2022-23:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Jun-22	1965	1.77
2	Jul-22	2005	1.80
3	Aug-22	2178	1.96
4	Sep-22	2201	1.98
5	Oct-22	2036	1.83
6	Nov-22	1970	1.77
7	Dec-22	1896	1.71
8	Jan-23	1978	1.78
9	Feb-23	1850	1.67
10	Mar-23	1997	1.80
11	Apr-23	2036	1.83
12	May-23	2335	2.10
13	Total	24447	22.00
14	Maximum	2335	2.10
15	Minimum	1850	1.67
16	Average	2037.25	1.83

Chart No 2: To study the variation of Month wise Energy Purchased, kWh:



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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:

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

Now we compute the EPI for the College as under:

Table No 3: Computation of Energy Performance Index:

No	Particulars	Value	Unit
1	Total Annual Energy Purchased	24447	kWh
2	Energy Generated by Solar PV Plant	6000	kWh
3	Total Energy Purchased = 1+2	30447	kWh
4	Total Built up area of College	2601.28	m^2
5	Energy Performance Index =(3) / (4)	11.70	kWh/m^2

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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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 (lux/W/m²)

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 (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 (W/m²/100 lux) 100 Installed power density (W/m²/100 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 Lighting Power Density and percentage usage of LED Lighting to total Lighting Load of the College.

Table No 4: Computation of Lighting Power density at Room No: Faculty Room-1:

No	Particulars	Value	Unit
1	No of 20 W LED Fittings in Class Room	6	Nos
2	Load per Unit of 20 W Fitting	20	Watt
3	Total Load of 20 W FTL Fittings	120	W
4	Area of Room	71.25	m^2
5	Lighting Power Density = (3) / (4)	1.68	W/m^2

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Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

Now, we compute the usage of LED Lighting to Total Lighting Load, as under.

Percentage Usage of LEDs to Total Lighting Load:

- The Total Lighting Load of the College is **4.579 kW**
- All the Light Fittings are LEDs
- % of Usage of LEDs to Total Lighting Load is **100 %**

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-VI
STUDY OF RENEWABLE ENERGY & ENERGY EFFICIENCY

6.1 Usage of Renewable Energy:

The College has installed:

- Roof Top Solar PV Plant of Capacity 5 kWp

Photograph of Roof Top Solar PV Plant:

6.2 Energy Efficiency Measures adopted:

The College has Energy Efficient LED Fittings & STAR Rated AC

- **Photographs of LED Lighting & STAR Rated AC:**

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 020-24220747 Email: engress123@gmail.com

Ref: ES/DACC/21-22/01

Date: 11/6/2022

CERTIFICATE

This is to certify that we have conducted Energy Audit at, Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, in the Academic year 2021-22.

The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting
- Installation of 5 kWp Roof Top Solar PV Plant

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

For Engress Services,

A Y Mehendale,
BE- Mechanical, M Tech- Energy,
Certified Energy Auditor: EA-8192

ENGRESS SERVICES PUNE

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ENERGY AUDIT REPORT

of

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2021-22

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

Prepared by

ENGRESS SERVICES

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

ENGRESS SERVICES PUNE

REGISTRATION CERTIFICATES

Regn. No. EA-8192 No. 2942

National Productivity Council
(National Certifying Agency)
PROVISIONAL CERTIFICATE

This is to certify that Mr. / Ms. Achyut Yashavant Mehendale
son / daughter of Mr. Yashavant
has passed the National Certification Examination for Energy Auditors in April - 2007 conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

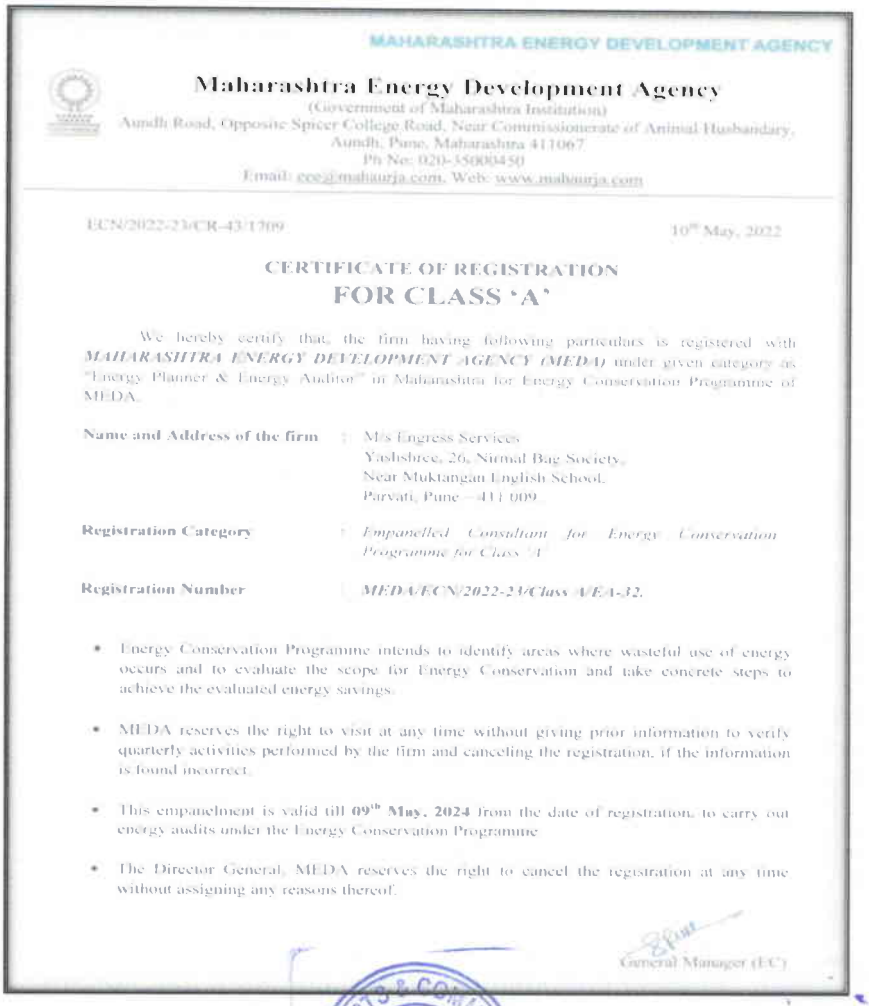
He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India
Date : 10th August 2007

Controller of Examination

BEE ENERGY AUDITOR CERTIFICATE



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: ece@mahaurja.com, Web: www.mahaurja.com

EC/2022-23/CR-43/1309 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/EC/N/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)

MEDA EMPANELMENT CERTIFICATE

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
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Balewadi, Pune-411045

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Dnyansagar Arts and Commerce College
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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, for awarding us the assignment of Energy Audit of their Baner campus for the Academic Year: 2021-22.

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

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment.

2. Present Energy Consumption & CO_2 Emission:

No	Parameter	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	16689	15.02
2	Maximum	2012	1.81
3	Minimum	989	0.89
4	Average	1390.75	1.25

3. Various Majors Adopted for Energy Conservation:

- Usage of Energy Efficient LED fittings
- Installation of **5 kWp** Roof Top Solar PV Plant

4. Usage of Alternate Energy Source:

- The College has installed **5 kWp** Roof Top Solar PV Plant.
- Energy generated by Solar PV Plant is **6000 kWh**
- Energy Purchased in 2021-22 is **16689 kWh**
- Total Energy Requirement in 2021-22 is **22689 kWh**
- % of Usage of Alternate Energy to Total Energy Demand in 2021-22 is **26.44 %**

5. Usage of LED Lighting:

- The Lighting Load is **4.497 kW.**
- All the Light Fittings are LEDs.
- The percentage of LED to the total Lighting Load is **100 %**

6. Assumptions:

1. **1 kWh of** Electrical Energy releases **0.9 Kg of CO_2** into atmosphere
2. Average Energy generated by Solar PV Plant is **4 kWh/kWp/Day**
3. Annual Solar Energy Generation Days in 2021-22 is **300 Nos**

7. References:

- For CO_2 Emissions: www.tatapower.com
- For Solar PV Energy generation: www.solarrooftop.gov.in

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ABBREVIATIONS

AC	:	Air conditioner
MSEDCL	:	Maharashtra Energy Distribution Company Limited
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
PC	:	Personal Computer
MT	:	Metric Ton

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Dnyansagar Arts and Commerce College
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CHAPTER-I
INTRODUCTION

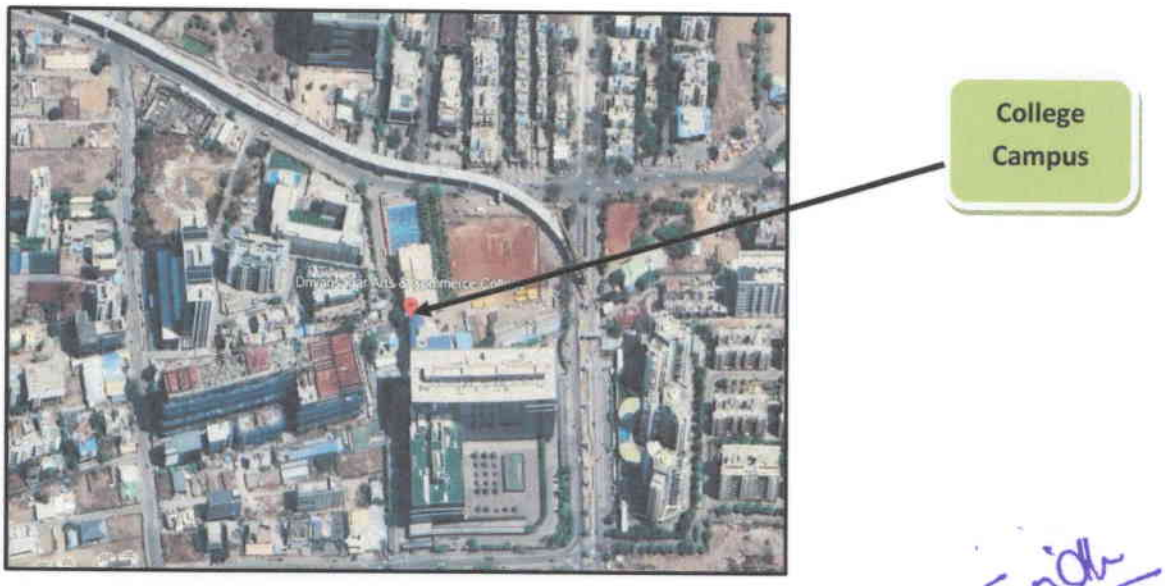
1.1 Objectives:

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

1.2 Table No-1: General Details of College:

No	Head	Particulars
1	Name	Dnyansagar Arts & Commerce College
2	Address	SKP Campus, Baner-Balewadi Road, Baner, Pune-411045
3	Year of Establishment	2008

1.3 Google Earth Image:



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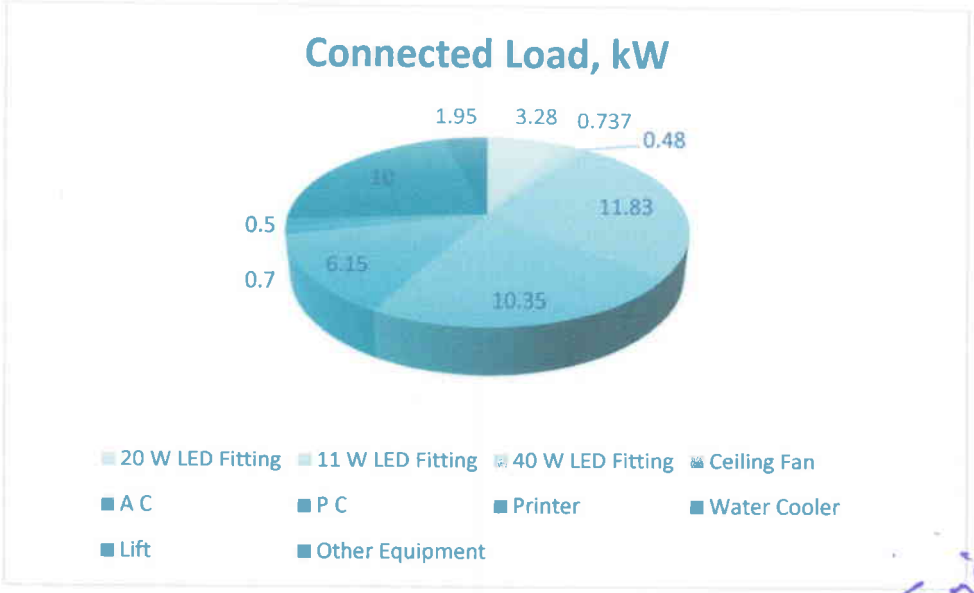
CHAPTER-II
STUDY OF CONNECTED LOAD

In this chapter, we present the details of various Electrical loads as under

Table No 2: Details of Overall Connected Load:

No	Equipment	Qty	Load/unit	Load, kW
1	20 W LED Fitting	164	20	3.28
2	11 W LED Fitting	67	11	0.737
3	40 W LED Fitting	12	40	0.48
4	Ceiling Fan	182	65	11.83
5	A C	6	1725	10.35
6	P C	41	150	6.15
7	Printer	4	175	0.7
8	Water Cooler	2	250	0.5
9	Lift	1	10000	10
10	Other Equipment	13	150	1.95
11	**Total**			**45.98**

Chart No 1: Total Connected Load:



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CHAPTER-III
STUDY OF ELECTRICAL ENERGY CONSUMPTION

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

Table No 3: Electrical Bill Analysis- 2021-22:

No	Month	Energy Purchased, kWh
1	Jun-21	1185
2	Jul-21	1006
3	Aug-21	989
4	Sep-21	1025
5	Oct-21	1136
6	Nov-21	1368
7	Dec-21	1458
8	Jan-22	1236
9	Feb-22	1598
10	Mar-22	1698
11	Apr-22	2012
12	May-22	1978
13	Total	16689
14	Maximum	2012
15	Minimum	989
16	Average	1390.75

Chart No 2: To study the variation of Month wise Energy Purchased, kWh:

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CHAPTER-IV
CARBON FOOTPRINTING

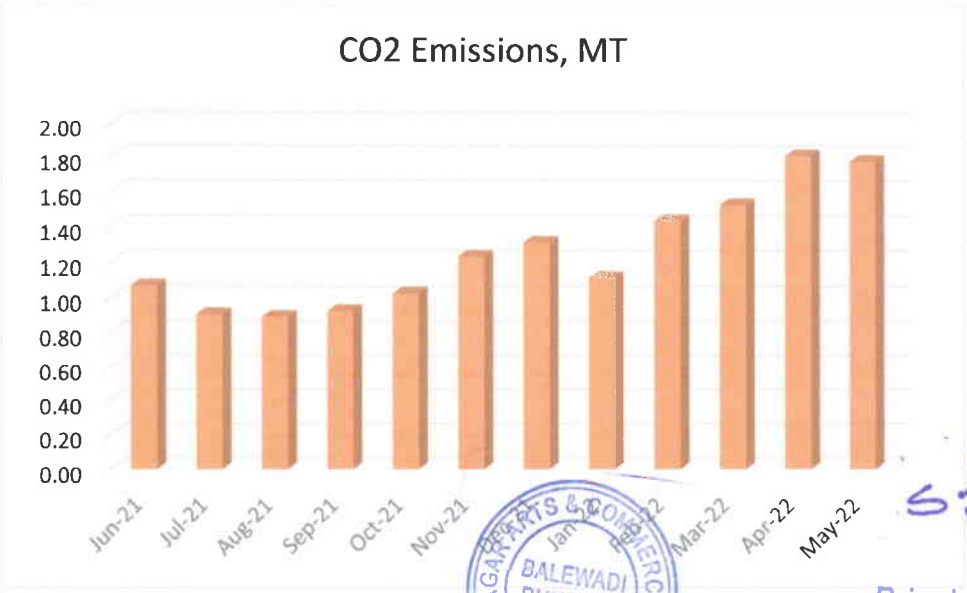
A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO_2 Emissions:**

- **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 Purchased, kWh	CO_2 Emissions, MT
1	Jun-21	1185	1.07
2	Jul-21	1006	0.91
3	Aug-21	989	0.89
4	Sep-21	1025	0.92
5	Oct-21	1136	1.02
6	Nov-21	1368	1.23
7	Dec-21	1458	1.31
8	Jan-22	1236	1.11
9	Feb-22	1598	1.44
10	Mar-22	1698	1.53
11	Apr-22	2012	1.81
12	May-22	1978	1.78
13	Total	16689	15.02
14	Maximum	2012	1.81
15	Minimum	989	0.89
16	Average	1390.75	1.25

Chart No 3: Representation of Month wise CO_2 emissions:



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Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

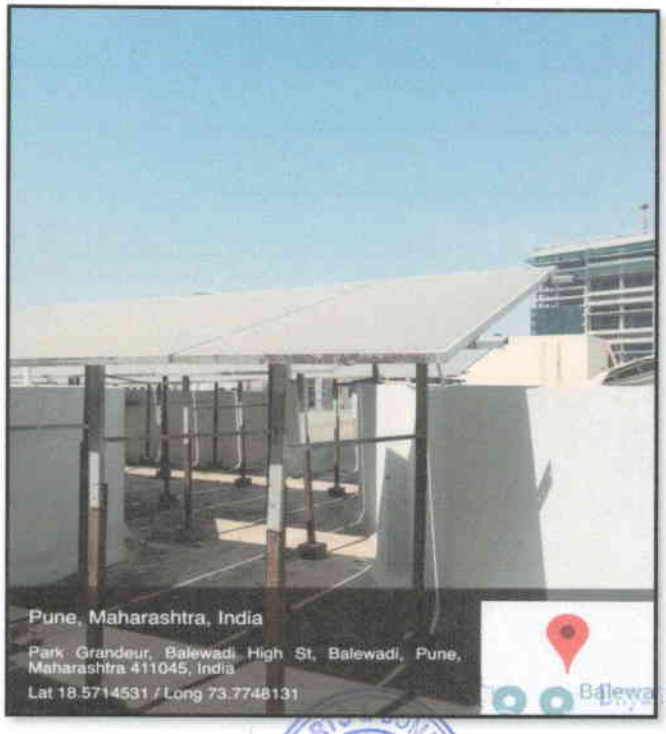
CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

The College has installed Roof Top Solar PV Plant of Capacity **5 kWp.**
Now we compute the % of Usage of Alternate Energy to Annual Energy Demand of the College.

Table No 4: Computation of % Usage of Alternate Energy:

No	Particulars	Value	Unit
1	Energy Purchased from MSEDCL	**16689**	kWh
2	Installed Roof Top Solar PV Plant Capacity	5	kWp
3	Average Daily Energy Generated	4	kWh/kWp
4	Annual Generation Days	300	Nos
5	Annual Solar Energy Generated = **2*3*4**	**6000**	kWh
6	Total Energy Demand = (1) + (5)	**22689**	kWh
7	Usage of Alternate Energy to Annual Energy Demand =5*100/6	**26.44**	%

Photograph of Roof Top Solar PV Plant:



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BALEWADI PUNE - 45

CHAPTER-VI
STUDY OF USAGE OF LED LIGHTS

In this Chapter, we present the Total Lighting Load met by LEDs.

Computation of Total Lighting Load met by LED Lights:

- The Total Lighting Load of the College is **4.497 kW**
- All the Light Fittings are LEDs
- % of Usage of LEDs to Total Lighting Load is **100 %**

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41[illegible]

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 020-24220747 Email: enrichcons@gmail.com

Ref: EC/DACC/20-21/01

Date: 29/7/2021

CERTIFICATE

This is to certify that we have conducted Energy Audit at, Dnyansagar Arts & Commerce College, SKP Campus, Baner-Balewadi Road, Baner, Pune-411045, in the Academic year 2020-21.

The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting
- Installation of 5 kWp Roof Top Solar PV Plant

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor,
EA-8192

ENRICH CONSULTANTS * PUNE *

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ENERGY AUDIT REPORT

of

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2020-21

Prepared by

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com

REGISTRATION CERTIFICATES

Regn. No. EA-8192 No. 2942

National Productivity Council
(National Certifying Agency)

PROVISIONAL CERTIFICATE

This is to certify that Mr. / Ms. *Achyut Yashavant Mehendale*
son / daughter of Mr. *Yashavant*
has passed the National Certification Examination for Energy Auditors in April - 2007, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

He / She is qualified as *Certified Energy Manager* as well as *Certified Energy Auditor*.

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India
Date : 10th August 2007

Controller of Examination

BEE ENERGY AUDITOR CERTIFICATE

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: eec@mahaurja.com, Web: www.mahaurja.com

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)

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

MEDA REGISTRATION CERTIFICATE

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Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, for awarding us the assignment of Energy Audit of their Baner campus for the Academic Year: 2020-21.

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

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment.

2. Present Energy Consumption & CO_2 Emission:

No	Parameter	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	11837	10.65
2	Maximum	1478	1.33
3	Minimum	568	0.51
4	Average	986.42	0.89

3. Various Majors Adopted for Energy Conservation:

- Usage of Energy Efficient LED fittings
- Installation of **5 kWp** Roof Top Solar PV Plant

4. Usage of Alternate Energy Source:

- The College has installed **5 kWp** Roof Top Solar PV Plant.
- Energy generated by Solar PV Plant is **6000 kWh**
- Energy Purchased in 2020-21 is **11837 kWh**
- Total Energy Requirement in 2020-21 is **17838 kWh**
- % of Usage of Alternate Energy to Total Energy Demand in 2020-21 is **33.64 %**

5. Usage of LED Lighting:

- The LED Lighting Load is **4.497 kW.**
- The Total Lighting Load is **4.497 kW.**
- The percentage of LED to the total annual lighting power requirement is **100 %**

6. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere
2. Average Energy generated by Solar PV Plant is **4 kWh/kWp/Day**
3. Annual Solar Energy Generation Days in 2020-21 is **300 Nos**

7. References:

- For CO_2 Emissions: www.tatapower.com
- For Solar PV Energy generation: www.solarrooftop.gov.in

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ABBREVIATIONS

AC	:	Air conditioner
MSEDCL	:	Maharashtra Energy Distribution Company Limited
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
PC	:	Personal Computer
MT	:	Metric Ton

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE * BALEWADI PUNE - 45

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No-1: General Details of College:

No	Head	Particulars
1	Name	Dnyansagar Arts & Commerce College
2	Address	SKP Campus, Baner-Balewadi Road, Baner, Pune-411045
3	Year of Establishment	2008

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

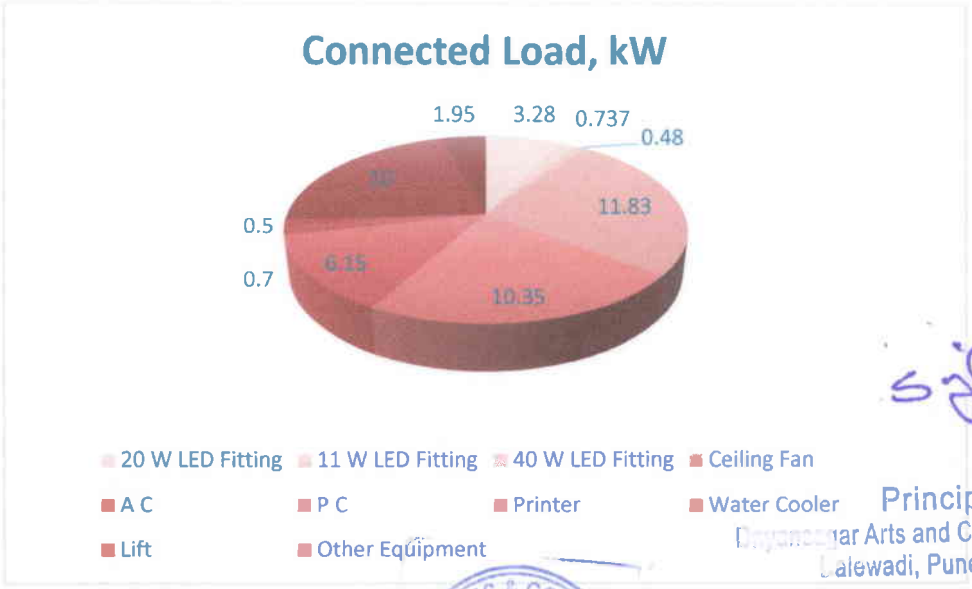
CHAPTER-II
STUDY OF CONNECTED LOAD

In this chapter, we present the details of various Electrical loads as under

Table No 2: Details of Overall Connected Load:

No	Equipment	Qty	Load, W/unit	Load, kW
1	20 W LED Fitting	164	20	3.28
2	11 W LED Fitting	67	11	0.737
3	40 W LED Fitting	12	40	0.48
4	Ceiling Fan	182	65	11.83
5	A C	6	1725	10.35
6	P C	41	150	6.15
7	Printer	4	175	0.7
8	Water Cooler	2	250	0.5
9	Lift	1	10000	10
10	Other Equipment	13	150	1.95
11	**Total**			**45.98**

Chart No 1: Total Connected Load:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

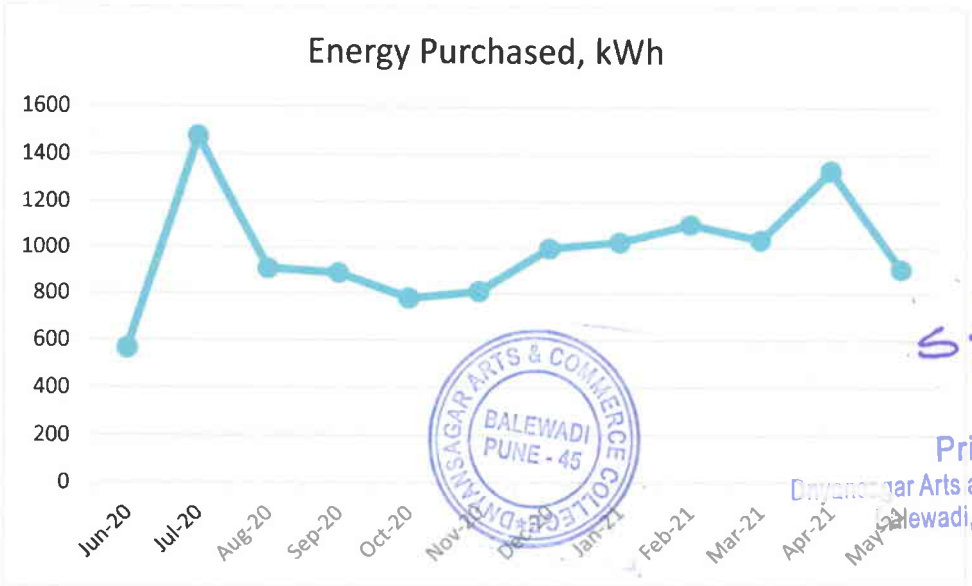
CHAPTER-III
STUDY OF ELECTRICAL ENERGY CONSUMPTION

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

Table No 3: Electrical Bill Analysis- 2020-21:

No	Month	Energy Purchased, kWh
1	Jun-20	568
2	Jul-20	1478
3	Aug-20	909
4	Sep-20	889
5	Oct-20	780
6	Nov-20	809
7	Dec-20	997
8	Jan-21	1025
9	Feb-21	1103
10	Mar-21	1036
11	Apr-21	1336
12	May-21	907
13	Total	11837
14	Maximum	1478
15	Minimum	568
16	Average	986.42

Chart No 2: To study the variation of Month wise Energy Purchased, kWh:



DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-IV
CARBON FOOTPRINTING

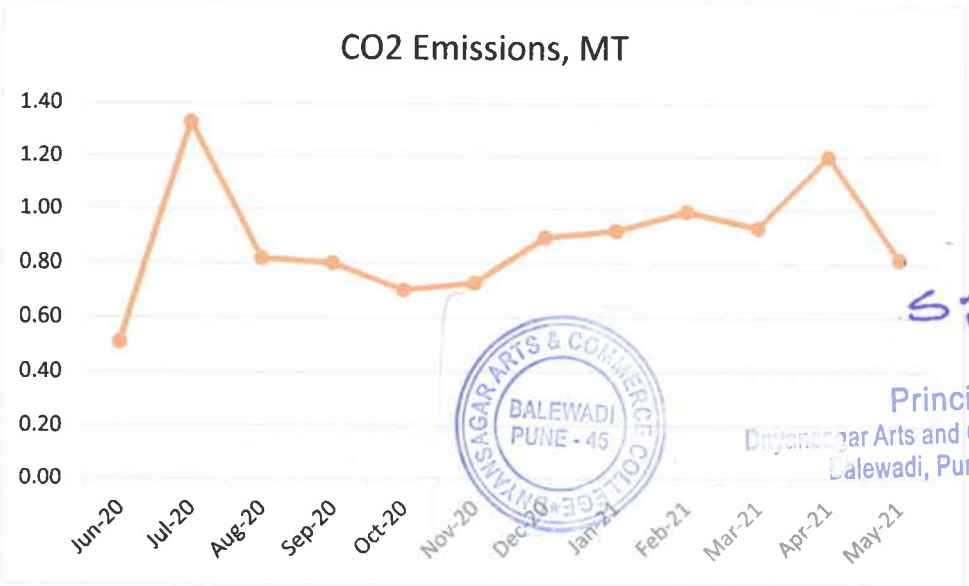
A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO_2 Emissions:**

- **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 Purchased, kWh	CO_2 Emissions, MT
1	Jun-20	568	0.51
2	Jul-20	1478	1.33
3	Aug-20	909	0.82
4	Sep-20	889	0.80
5	Oct-20	780	0.70
6	Nov-20	809	0.73
7	Dec-20	997	0.90
8	Jan-21	1025	0.92
9	Feb-21	1103	0.99
10	Mar-21	1036	0.93
11	Apr-21	1336	1.20
12	May-21	907	0.82
13	Total	11837	10.65
14	Maximum	1478	1.33
15	Minimum	568	0.51
16	Average	986.42	0.89

Chart No 3: Representation of Month wise CO_2 emissions:



DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

The College has installed 5 kWp Roof Top Solar PV Plant.
Now we compute the % of Usage of Alternate Energy to Annual Energy Demand of the College.

Table No 4: Computation of % Usage of Alternate Energy:

No	Particulars	Value	Unit
1	Energy Purchased from MSEDCL	**11837**	kWh
2	Installed Roof Top Solar PV Plant Capacity	5	kWp
3	Average Daily Energy Generated	4	kWh/kWp
4	Annual Generation Days	300	Nos
5	Annual Solar Energy Generated	**6000**	kWh
6	Total Energy Demand = (1) + (5)	**17837**	kWh
7	Usage of Alternate Energy to Annual Energy Demand =5*100/6	**33.64**	%

Photograph of Roof Top Solar PV Plant:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-VI
STUDY OF USAGE OF LED LIGHTS

In this Chapter, we present the Total Lighting Load met by LEDs.

Computation of Total Lighting Load met by LED Lights:

- The Total Lighting Load of the College is **4.497 kW**
- All the Light Fittings are LEDs
- % of Usage of LEDs to Total Lighting Load is **100 %**

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41[illegible]

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 020-24220747 Email: enrichcons@gmail.com

Ref: EC/DACC/19-20/01

Date: 12/8/2020

CERTIFICATE

This is to certify that we have conducted Energy Audit at, Dnyansagar Arts & Commerce College, SKP Campus, Baner-Balewadi Road, Baner, Pune-411045, in the Academic year 2019-20.

The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting
- Installation of 5 kWp Roof Top Solar PV Plant

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor,
EA-8192

ENRICH CONSULTANTS * PUNE *

DNYANSAGAR ARTS & COMMERCE COLLEGE * BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ENERGY AUDIT REPORT

of

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2019-20

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Prepared by

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com

ENRICH CONSULTANTS PUNE

REGISTRATION CERTIFICATES

Regn. No. EA-8192 No. 2942

National Productivity Council
(National Certifying Agency)
PROVISIONAL CERTIFICATE

This is to certify that Mr. / Ms. Achyut Yashavant Mehendale
son / daughter of Mr. Yashavant
has passed the National Certification Examination for Energy Auditors in April - 2007, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India
Date : 28th August 2007

Controller of Examination

BEE ENERGY AUDITOR CERTIFICATE

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006.
Ph.No. 020-26614893/26614403
Email: eee@mahaurja.com, Web: www.mahaurja.com

ECN/2018-19/CR-05/4174 19th September, 2018

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	:	**Enrich Consultants** Yashashree, Plot No. 26, Nirmal Bag Society, Near Mahtangat English School, Parvati, Pune – 411009
Registration Category	:	Empanelled *Consultant for Energy Conservation Programme*
Registration Number	:	***MEDA/ECN/CR-05/2018-19/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 the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **31st March 2021** 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.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

(Smita Kudarikar)
General Manager (EC)

MEDA EMPANELMENT CERTIFICATE

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045

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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

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No	Parameter	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	19886	17.90
2	Maximum	2157	1.94
3	Minimum	568	0.51
4	Average	1657.17	1.49

3. Various Majors Adopted for Energy Conservation:

- Usage of Energy Efficient LED fittings
- Installation of **5 kWp** Roof Top Solar PV Plant

4. Usage of Alternate Energy Source:

- The College has installed **5 kWp** Roof Top Solar PV Plant.
- Energy generated by Solar PV Plant is **6000 kWh**
- Energy Purchased in 2019-20 is **19886 kWh**
- Total Energy Requirement in 2019-20 is **25886 kWh**
- % of Usage of Alternate Energy to Total Energy Demand in 2019-20 is **23.18 %**

5. Usage of LED Lighting:

- The LED Lighting Load is **4.357 kW.**
- The Total Lighting Load is **4.357 kW.**
- The percentage of LED to the total lighting power requirement is **100 %**

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3. Annual Solar Energy Generation Days in 2019-20 is **300 Nos**

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Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

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In this chapter, we present the details of various Electrical loads as under

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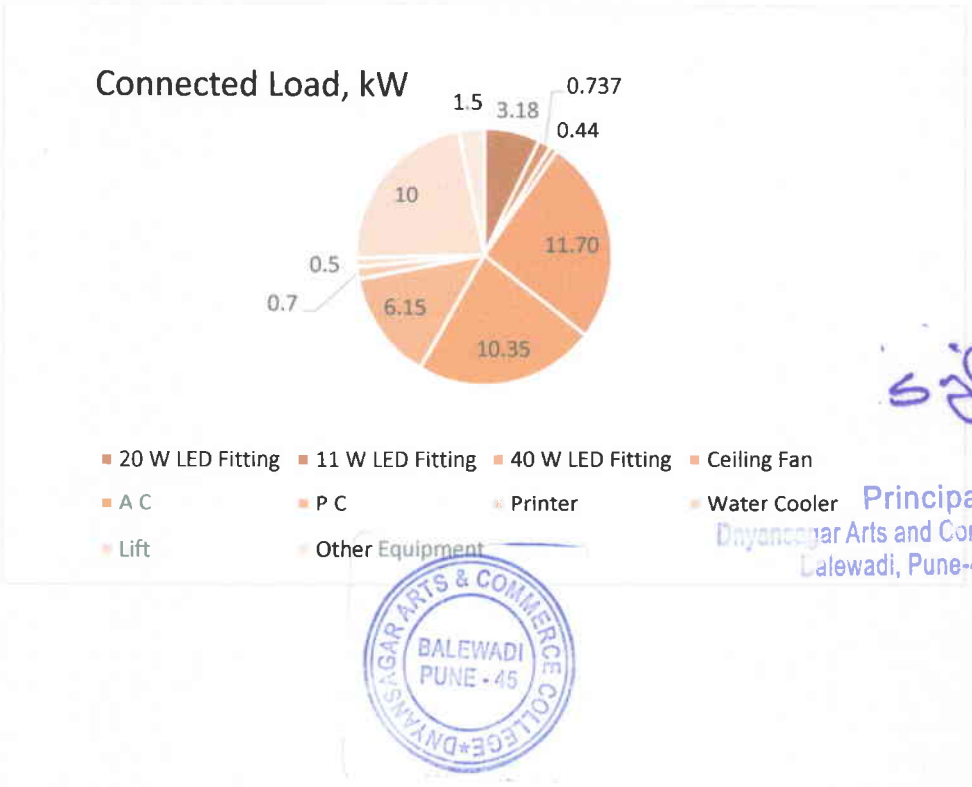
3	40 W LED Fitting	11	40	0.44
4	Ceiling Fan	180	65	11.70
5	A C	6	1725	10.35
6	P C	41	150	6.15
7	Printer	4	175	0.7
8	Water Cooler	2	250	0.5
9	Lift	1	10000	10
10	Other Equipment	10	150	1.5
11	**Total**			**45.26**

Chart No 1: Total Connected Load:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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

Table No 3: Electrical Bill Analysis- 2019-20:

No	Month	Energy Purchased, kWh
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3	Aug-19	1658
4	Sep-19	1798
5	Oct-19	1870
6	Nov-19	1960
7	Dec-19	1908
8	Jan-20	2036
9	Feb-20	2157
10	Mar-20	1365
11	Apr-20	568
12	May-20	568
13	Total	19886
14	Maximum	2157
15	Minimum	568
16	Average	1657.17

Chart No 2: To study the variation of Month wise Energy Purchased, kWh:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

BALEWADI PUNE - 45

CHAPTER-IV
CARBON FOOTPRINTING

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO_2 Emissions:**

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

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2	Jul-19	1980	1.78
3	Aug-19	1658	1.49
4	Sep-19	1798	1.62
5	Oct-19	1870	1.68
6	Nov-19	1960	1.76
7	Dec-19	1908	1.72
8	Jan-20	2036	1.83
9	Feb-20	2157	1.94
10	Mar-20	1365	1.23
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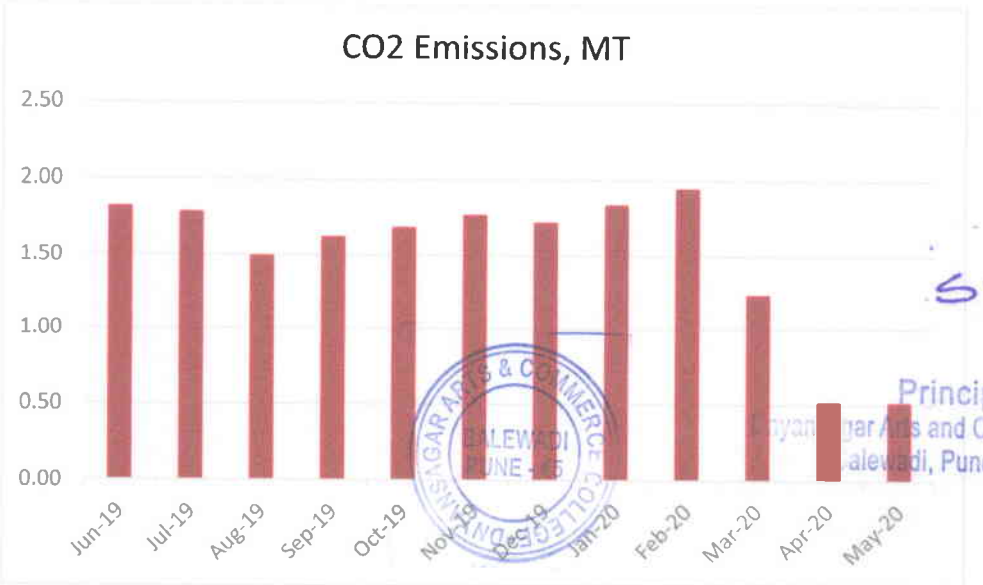

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

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Now we compute the % of Usage of Alternate Energy to Annual Energy Demand of the College.

Table No 4: Computation of % Usage of Alternate Energy:

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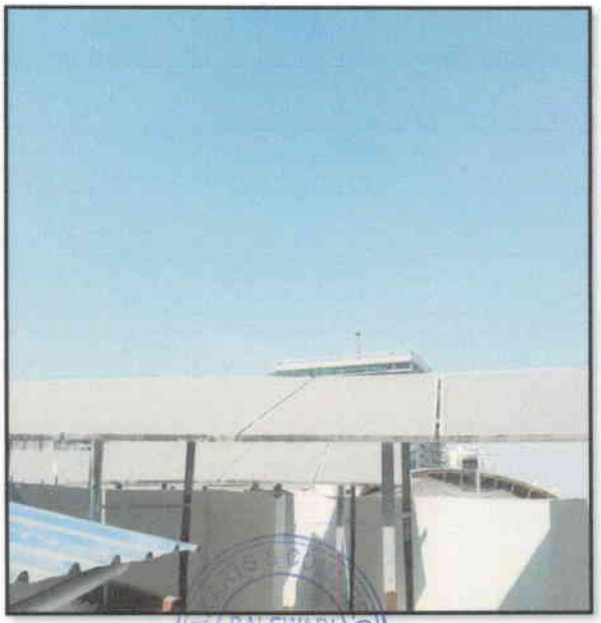
7	Usage of Alternate Energy to Annual Energy Demand =5*100/6	**23.18**	%

Photograph of Roof Top Solar PV Plant:



BALEWADI PUNE - 45 COLLEGE*DNYANSAGAR

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045

CHAPTER-VI
STUDY OF USAGE OF LED LIGHTS

In this Chapter, we present the Total Lighting Load met by LEDs.

Computation of Total Lighting Load met by LED Lights:

- The Total Lighting Load of the College is **4.357 kW**
- All the Light Fittings are LEDs
- % of Usage of LEDs to Total Lighting Load is **100 %**

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Certificates of the awards

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

SWARNANAGARI

SWARNANAGARI OLD AGE HOME'S SOCIAL WELFARE FOUNDATION

Add- Plot No, 6, Shivneri Park Rd, Balewadi Phata, Sushil Kunj, Balewadi, Pune, Maharashtra 411045
Chairman Nitin Dede 9067633947/9073369369 | **Secretary Rashmi Dede** 7057477605
Email ID – info@swarnanagrioldagehomes.com | nitindede05@gmail.com | **Web**-www.swarnanagrioldagehomes.com
Soc Reg No. MH365/2019/Pune F-53254 | **PAN No.** AAXTS6149M
Unique Reg No. Under section **80G** AAXTS6149MF20221 | **12A** AAXTS6149ME20221
Niti Aayog Reg No. MH/2022/0311407 | **LEI No.** 9845001BD5C1D43AZF47

Date: 27-11-2024

To,
The Principal,
Dnyansagar Arts and Commerce College
SKP Campus, Balewadi
Pune, Maharashtra

Subject: Letter of Appreciation for Fundraising Activity

Dear Principal,
On behalf of /Swarnanagari Old Age Home, I extend my heartfelt gratitude to you, your esteemed faculty members, and the compassionate students of **'Dnyansagar Arts and Commerce College'** for organizing a commendable fundraising activity on **25 July 2024.**
Your efforts have made a significant impact on the lives of the elderly residents of Swarnanagari Old Age Home, bringing comfort, care, and hope to their hearts. The funds raised through your collective dedication and hard work have greatly contributed to meeting their essential needs and enhancing their quality of life.
This initiative is a true reflection of the values of social responsibility and empathy that your institution instills in its students. It is inspiring to witness the seamless collaboration between students and faculty members in achieving such a noble cause.
We deeply appreciate your generosity and commitment, and we look forward to your continued support in the future. Your contributions have not only brought smiles to the elderly but also set an exemplary standard for community service.
Once again, thank you for your remarkable efforts, and we hope to strengthen this bond in future endeavors.

Warm regards,
Nitin Shamrao Dede.
(Founder Trustee)
+91 9372449472
Swarnanagari Oldage Homes Social Welfare Foundation

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

SAMPARC

Social Action For Manpower Creation

A Regd. Society under Societies Registration Act XXI of 1860 (MAH/5296-90/Pune) and Public Trust Act of 1950 (F/6399/Pune)

ADMIN OFFICE:
SAMPARC, Varad Appts, Plot No. 292, S. No. 37-45,
Yashwantnagar, Talegaon-Dabhade,
Dist. Pune – 410 507, Maharashtra, India.
Tel.: (02114) 227335, 231472, M: +91 9766343456
E-mail: samparc6@gmail.com,
Website: www.samparc.org

SECRETARIAL OFFICE:
SAMPARC Malavli Centre,
Near Malavli Rly. Station, Vill. Bhaje, Tal. Maval,
Dist. Pune, Maharashtra- 410405, India.
Mob: 9890707737
E-mail: samparc6@gmail.com,
Website: www.samparc.org

Date: 10-09-2024

To,
The Principal
Dnyansagar Arts and Commerce College
Balewadi
Pune, Maharashtra

Subject: Heartfelt Appreciation for Fundraising and Engagement Activities for SAMPARC Balgram

Dear Sir,

On behalf of **SAMPARC Balgram, Bhaje,** I extend our deepest gratitude to the students and faculty members of Dnyansagar Arts and Commerce College for their remarkable Collection Drive initiative and heartfelt engagement with the children of our organization.

Your institution's efforts in organizing this activity not only demonstrated a profound sense of social responsibility but also brought immense joy and positivity to the lives of the children at Balgram. The time your students and faculty spent with the orphan children was deeply meaningful, fostering a sense of belonging and warmth among them.

A special mention goes to the **Zumba session conducted for the girls at Balgram,** which was a wonderful and uplifting experience. Such interactive and creative initiatives not only help in enhancing the well-being of the children but also inspire them to embrace positivity and confidence.

The funds raised through your efforts will greatly contribute to the welfare and development of the children under our care, ensuring they have access to better opportunities and resources for their growth.

We are truly inspired by the compassion and commitment shown by your institution and hope to continue this meaningful partnership in the future. Thank you for supporting our cause and making a difference in the lives of these children.

Yours sincerely,

Anuj Singh,
Chief Operating Officer-SAMPARC

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

Donations to SAMPARC are exempted from Income Tax u/s 80G.

SAMPARC

Social Action For Manpower Creation

A Regd. Society under Societies Registration Act XXI of 1860 (MAH/5296-90/Pune) and Public Trust Act of 1950 (F/6399/Pune)

ADMIN OFFICE:
SAMPARC, Varad Appts, Plot No. 292, S. No. 37-45, Yashwantnagar, Talegaon-Dabhade, Dist. Pune – 410 507, Maharashtra, India.
Tel.: (02114) 227335, 231472, M: +91 9766343456
E-mail: samparc6@gmail.com,
Website: www.samparc.org

SECRETARIAL OFFICE:
SAMPARC Malavli Centre, Near Malavli Rly. Station, Vill. Bhaje, Tal. Maval, Dist. Pune, Maharashtra- 410405, India.
Mob: 9890707737
E-mail: samparc6@gmail.com,
Website: www.samparc.org

Date: 28/12/2022

To,
The Principal,
Dnyansagar Arts and Commerce College,
Balewadi,
Pune, Maharashtra

Subject: Appreciation for Participation in SAMPARC Heritage Walk 2022

Dear Sir/Madam,

On behalf of the organizing team of the **SAMPARC Heritage Walk 2022**, I extend our heartfelt gratitude to Dnyansagar Arts and Commerce College for your enthusiastic participation in the event, held on 18th December, 2022.

The involvement of your students and faculty members was truly commendable as they joined the walk from Bhaje Caves to Lohagad Fort, Maval, Pune. Their active participation in this initiative to care for, conserve, and protect our historical monuments was inspiring and reflective of your institution's commitment to promoting heritage awareness and preservation.

The purpose of this heritage walk, in collaboration with the Archaeological Survey of India (Mumbai Circle) and supported by the Government of India, was to advocate for the inclusion of **Bhaje Caves** and **Lohagad Fort** in the UNESCO World Heritage List. Your college's participation added significant value to this mission, helping to highlight the rich cultural and historical importance of these monuments.

We deeply appreciate your support and collaboration in this effort, which aligns with the shared vision of safeguarding our nation's heritage for future generations. We look forward to your continued involvement in such initiatives.

Thank you once again for your valuable contribution.

Yours sincerely,

Anuj Singh,
Chief Operating Officer-SAMPARC

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

॥श्रध्दावान लभते ज्ञानम् ॥

SHRI KHANDERAI PRATISHTHAN

बालेवाडी,पुणे-४५

Reg. No. Maharashtra/4091/88/Pune Date 20.06.1988, Reg. No. F-5073 Pune Date 05.08.1988

Shri. Ganpatrao Balwadkar
Founder - President

Dr. Saagar Balwadkar
Secretary

Date: 14/08/2018

This is to certify that, Dnyansagar College of Arts and Commerce can avail the benefit of Roof Top Solar PV Plant of Capacity 5 kWp.

Shri. Ganpatrao Balwadkar
President, SKP Campus,
Balewadi, Pune

Shri Khanderai Pratishthan Pune-45. Balewadi

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Muktangan English School,
Parvati, Pune 411 009 Tel: 09890444795 Email: engress123@gmail.com
UDYAM Regn. No: UDYAM-MH-26-0135636,
MEDA Regn. No: ECN/2023-24/CR-43/1709
ISO: 9001-2015 Certified (Cert No: 23EQKC13),
ISO: 14001-2015 Certified (Cert No: 23EEKW20)

GREEN AUDIT CERTIFICATE

Certificate No: ES/ DACC /23-24/02 **Date: 18/7/2024**

This is to certify that we have conducted Green Audit at Dnyansagar Arts & Commerce College, SKP Campus, Baner-Balewadi Road, Baner, Pune-411045, in the Academic Year 2023-24.

The College has adopted following Green & Sustainable Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 10 kWp
- Segregation of Waste at source
- Provision of Bio Composting Bed, for conversion of Organic Waste
- Provision of Sanitary Waste Incinerator for Sanitary Waste
- Implementation of Rain Water Management Project
- Good internal Road within the campus
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of Awareness on Water 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.

Principal
Dnyansagar Arts and Commerce College
Baner, Pune-411045.

For Engress Services,

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

GREEN AUDIT REPORT

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2023-24

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411 045.

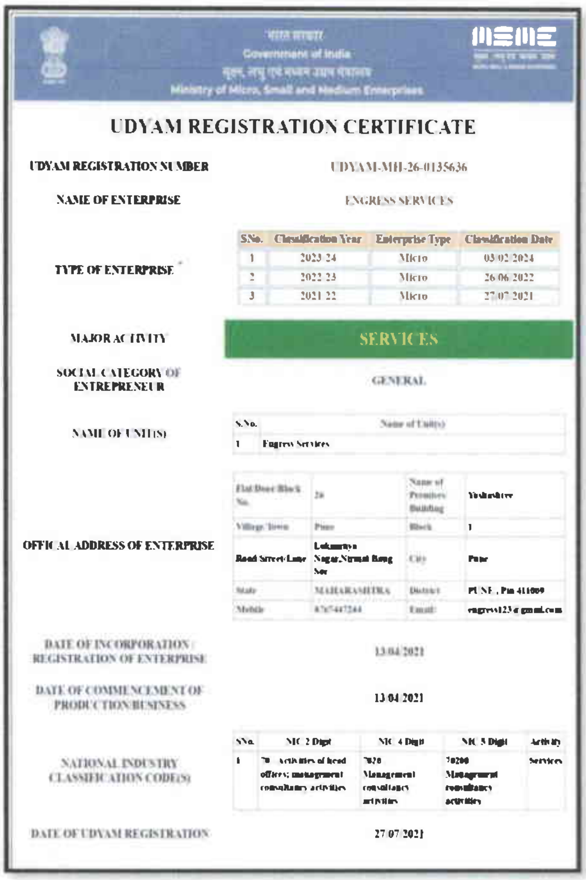
Prepared by:

ENGRESS SERVICES

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

ENGRESS SERVICES PUNE

Registration Certificates: UDYAM, MEDA, ASSOCHAM GEM-CP, ISO: 9001 & 14001:



Government of India
Ministry of Micro, Small and Medium Enterprises

UDYAM REGISTRATION CERTIFICATE

UDYAM REGISTRATION NUMBER: UDYAM-MH-26-0135636

NAME OF ENTERPRISE: ENGRESS SERVICES

TYPE OF ENTERPRISE:

S.No.	Classification Year	Enterprise Type	Classification Date
1	2023-24	Micro	03/02/2024
2	2022-23	Micro	26/06/2022
3	2021-22	Micro	27/07/2021

MAJOR ACTIVITY: SERVICES

SOCIAL CATEGORY OF ENTREPRENEUR: GENERAL

NAME OF UNIT(S):

S.No.	Name of Unit(s)
1	Engress Services

OFFICIAL ADDRESS OF ENTERPRISE:

Flat/Door/Block No.	28	Name of Premises/ Building	Yashashree
Village/Town	Pune	Block	1
Road/Street/Lane	Lokmanya Nagar,Nirmal Baug Soc	City	Pune
State	MAHARASHTRA	District	PUNE , Pin 411009
Mobile	8767447244	Email:	engress123@gmail.com

DATE OF INCORPORATION / REGISTRATION OF ENTERPRISE: 13/04/2021

DATE OF COMMENCEMENT OF PRODUCTION/BUSINESS: 13/04/2021

NATIONAL INDUSTRY CLASSIFICATION CODE(S):

S.No.	NIC 2 Digit	NIC 4 Digit	NIC 5 Digit	Activity
1	70 - Activities of head offices; management consultancy activities	7020 - Management consultancy activities	70200 - Management consultancy activities	Services

DATE OF UDYAM REGISTRATION: 27/07/2021

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

Pankaj R. Dharkar — GEM CP 22788 — Deepak Sood

Certificate of Registration

This is to Certify that
Quality Management System of

ENGRESS SERVICES

has been assessed and found to conform to the requirements of

ISO 9001:2015

for the following scope

Director

Magnitude Management Services Pvt. Ltd.

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

Certificate of Registration

This is to Certify that
Environmental Management System of

ENGRESS SERVICES

has been assessed and found to conform to the requirements of

ISO 14001:2015

for the following scope

Director

Magnitude Management Services Pvt. Ltd.

DNYANSAGAR ARTS & COMMERCE COLLEGE
BALEWADI
PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, for awarding us the assignment of Green Audit of their Baner campus for the Academic Year: 2023-24.

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

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment.

2. Present Energy Consumption & CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Purchased	**25260**	kWh
2	Annual CO_2 Emissions	**23.49**	MT

3. Renewable Energy Usage & Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Solar PV Plant Capacity	**5**	kWp
2	Energy generated in 23-24	**6000**	kWh
3	Reduction in Annual CO_2 Emissions	**5.58**	MT

4. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Organic Waste	Provision of Bio Composting Bed
3	Sanitary Waste	Provision of Sanitary waste Incinerator
4	E Waste	Recommended to dispose of through Authorized Agency

5. Rain Water Management:

The Rain water falling on the terrace is used to increase the Underground Water Table.

6. Green & Sustainable Practices:

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

7. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.93 Kg** of CO_2 into atmosphere
2. **1 kWp** Solar PV system generates **4 kWh** of Electrical Energy per Day
3. Annual Solar Energy Generation Days: **300 Nos**
4. Energy Consumption is computed on the basis of Load Utilization Factor

8. References:

- For CO_2 Emissions: www.ccd.gujarat.gov.in
- For Solar PV Energy generation: www.solarrooftop.gov.in

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ABBREVIATIONS

BEE	Bureau of Energy Efficiency
kWh	Kilo Watt Hour
LPD	Liters Per Day
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
Qty	Quantity

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-I
INTRODUCTION

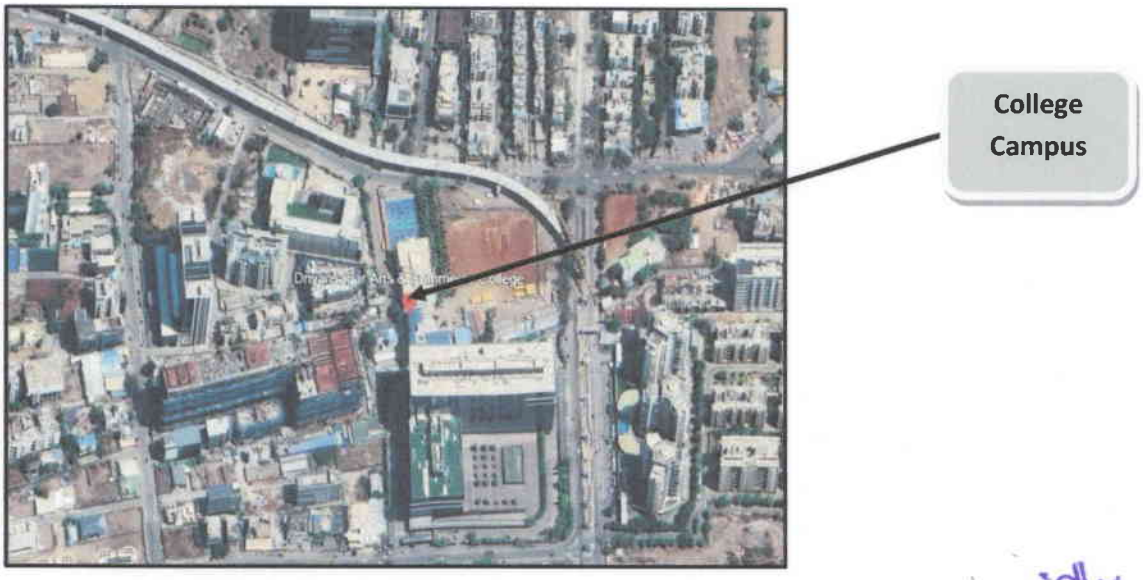
1.1 Introduction:

A Green Audit is conducted at Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune

1.2 Key Study Points:

No	Particulars
1	Study of Present Energy Consumption & CO_2 Emission
2	Study of Usage of Renewable Energy
3	Study of Waste Management Practices
4	Study of Rain Water Management
5	Study of Green & Sustainable Initiatives

1.3 College Location Image:



DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

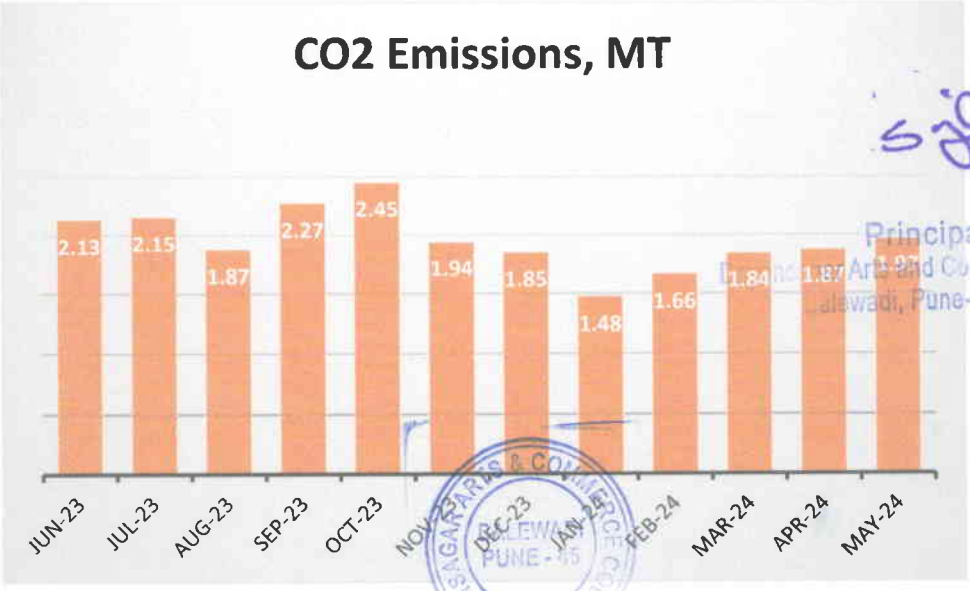
CHAPTER-II
STUDY OF ENERGY CONSUMPTION & CO_2 EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO_2 Emissions: 1 kWh** of Electrical Energy releases **0.93 Kg of CO_2** into atmosphere.

Table No 1: Month wise Energy Consumption & CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Jun-23	2290	2.13
2	Jul-23	2315	2.15
3	Aug-23	2015	1.87
4	Sep-23	2445	2.27
5	Oct-23	2635	2.45
6	Nov-23	2085	1.94
7	Dec-23	1987	1.85
8	Jan-24	1587	1.48
9	Feb-24	1789	1.66
10	Mar-24	1980	1.84
11	Apr-24	2015	1.87
12	May-24	2117	1.97
13	Total	25260	23.49
14	Maximum	2635	2.45
15	Minimum	1587	1.48
16	Average	2105	1.96

Chart No 1: Month wise CO_2 Emissions:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER III
STUDY OF USAGE OF RENEWABLE ENERGY

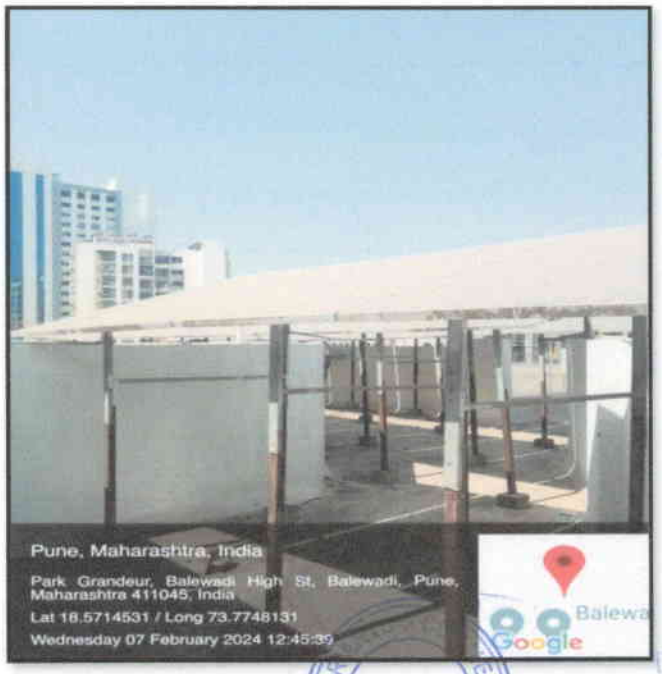
The College has installed Roof Top Solar PV Plant of Capacity 5 kWp.

In the following Table, we compute the Annual Reduction in CO_2 Emissions due to installation of Roof Top Solar PV Plant.

Table No 2: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	5	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy Generation Days	300	Nos
4	Energy Generated in the Year: 23-24	**6000**	kWh
5	1 kWh of Electrical Energy saves	**0.93**	Kg/kWh
6	**Qty of CO_2 Saved by Solar PV Plant =(4)*(5) /1000**	**5.58**	**MT of CO_2**

Photograph of Roof Top Solar PV Plant:



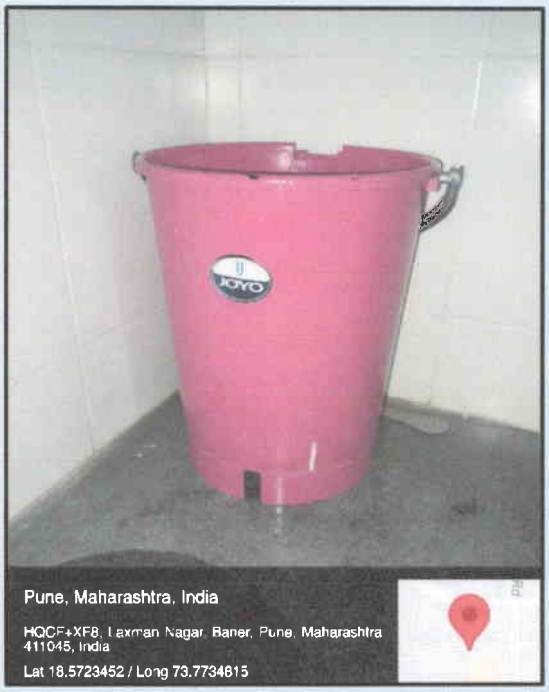
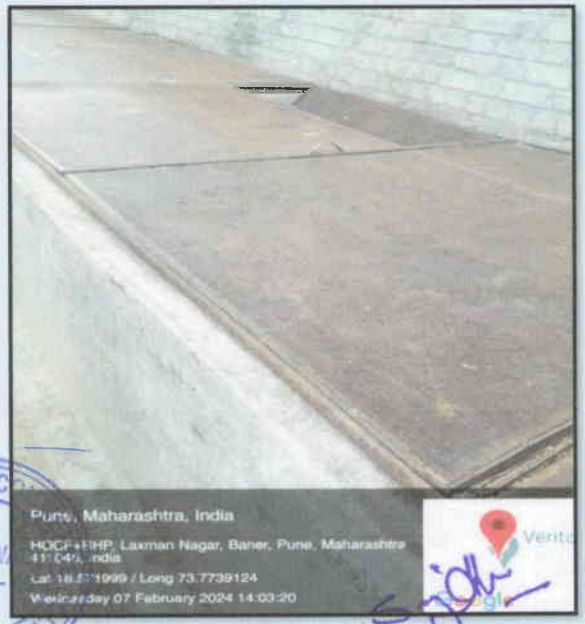
Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

BALEWADI PUNE - 45 DNYANSAGAR COLLEGE

CHAPTER IV
STUDY OF WASTE MANAGEMENT

In this Chapter, we present the Waste Management Practices, followed by the College.

Details of Waste Management Practices:

No	Head	Observation	Photograph
1	**Solid Waste**	Segregation of Waste at Source: Provision of Waste Collection Bins	**Waste Collection Bin:** 
2	**Organic waste**	Provision of Bio Composting Bed	**Bio Composting Bed:** 

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41...

3	**Sanitary Waste**	Provision of Sanitary Waste Incinerator	**Sanitary Waste Incinerator** 
4	**E Waste**	Recommended to dispose of E Waste through Authorized Agency	

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41[illegible]

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-V
STUDY OF RAIN WATER MANAGEMENT

The College has installed the Rain Water Harvesting Project. The Rain Water falling on the terrace is used to increase the Underground Water table.

Photograph of Rain Water Collecting Pipe:

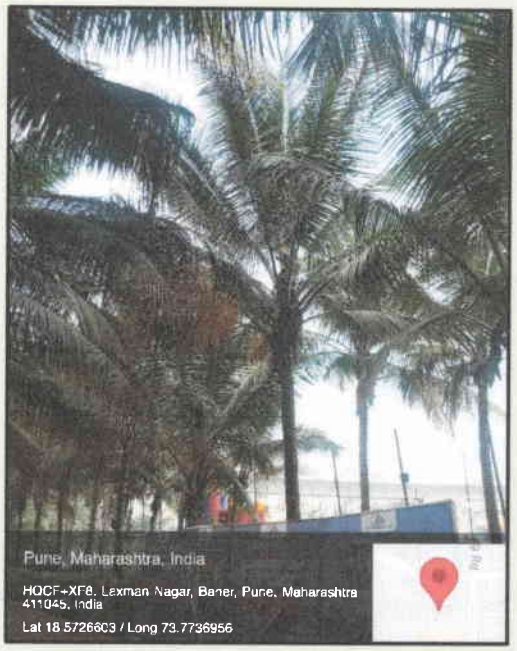
Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-VI
STUDY OF GREEN & SUSTAINABLE PRACTICES

In this Chapter, we present the Green & Sustainable Practices followed by the College.

Green & Sustainable Practices:

No	Head	Observation	Photograph
1	**Easy Movement of Stake Holders**	Provision of Good Internal Road within the Campus	**Internal Road:** 
2	**Tree Plantation**	Internal Tree Plantation in the Campus	**Internal Tree Plantation:** 

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045

3	**Facilities for Divyangajan**	Provision of Ramp for Divyangajan	**Ramp for Divyangajan:** 
4	**Creation of Awareness among Stake Holders**	Display of Poster on Water Conservation	**Poster on Water Conservation:** 

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ENGRESS SERVICES

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

GREEN AUDIT CERTIFICATE

Certificate No: ES/DACC/22-23/02 **Date: 13/7/2023**

This is to certify that we have conducted Green Audit at Dnyansagar Arts & Commerce College, SKP Campus, Baner-Balewadi Road, Baner, Pune-411045, in the Academic year 2022-23.

The College has adopted following Green & Sustainable Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 10 kWp
- Segregation of Waste at source
- Provision of Bio Composting Bed, for conversion of Organic Waste
- Provision of Sanitary Waste Incinerator for Sanitary Waste
- Implementation of Rain Water Management Project
- Good internal Road within the campus
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of Awareness on Plastic Free Campus 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 Energy Efficient & Green.

For Engress Services,

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

ENGRESS SERVICES * PUNE *

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

GREEN AUDIT REPORT

of

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2022-23

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Prepared by

ENGRESS SERVICES

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

ENGRESS SERVICES PUNE

REGISTRATION CERTIFICATES

Maharashtra Energy Development Agency

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

MEDA REGISTRATION CERTIFICATE

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

Pankaj R. Dhakar — GEM CP 22/758 — Deepak Sood

ASSOCHAM GEM CP CERTIFICATE

Certificate of Registration

This is to Certify that
Quality Management System of

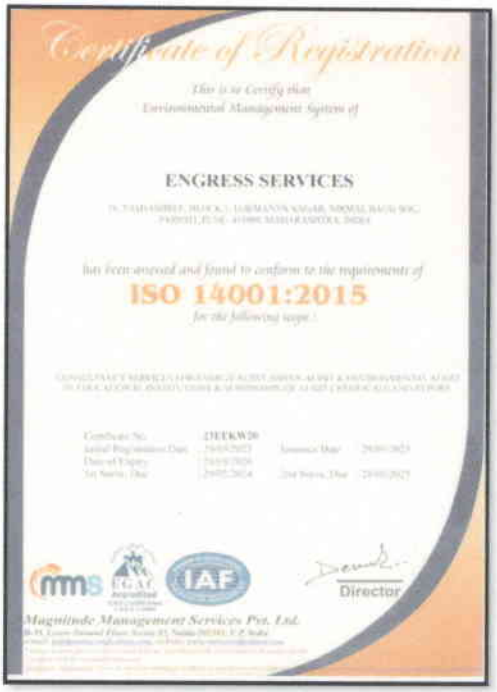
ENGRESS SERVICES

has been assessed and found to conform to the requirements of
ISO 9001:2015
for the following scope

Director

Magnitude Management Services Pvt. Ltd.

ISO: 9001-2015 CERTIFICATE



Certificate of Registration

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ENGRESS SERVICES

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ISO 14001:2015
for the following scope

Director

Magnitude Management Services Pvt. Ltd.

ISO: 14001-2015 CERTIFICATE

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-45

INDEX

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, for awarding us the assignment of Green Audit of their Baner campus for the Academic Year: 2022-23.

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

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment.

2. Present Energy Consumption & CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Purchased	**24447**	kWh
2	Annual CO_2 Emissions	**22**	MT

3. Renewable Energy & Reduction in CO_2 Emissions:

- The College has installed Roof Top Solar PV Plant of Capacity **5 kWp.**
- The Energy generated by Solar PV Plant in 22-23 is **6000 kWh.**
- Reduction in CO_2 Emissions in 22-23 is **5.4 MT**

4. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Organic Waste	Provision of Bio Composting Bed
3	Sanitary Waste	Provision of Sanitary waste Incinerator

5. Rain Water Management:

The Rain water falling on the terrace is used to increase the Underground Water Table.

6. Green & Sustainable Practices:

- Maintenance of good Internal Road
- Tree Plantation in the campus.
- Provision of Ramp for Divyangajan
- Creation of awareness on Plastic Free Campus by Display of Posters

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41...

7. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2 into atmosphere
2. Energy generated by Roof Top Solar PV Plant: **4 kWh/kWp per Day**
3. Annual Solar Energy Generation Days: **300 Nos**
4. Energy Consumption is computed on the basis of Load Utilization Factor

8. References:

- For CO_2 Emissions: www.tatapower.com
- For Solar PV Energy generation: www.solarrooftop.gov.in

ABBREVIATIONS

LED	:	Light Emitting Diode
KLPD	:	Kilo Liters per Day
Kg	:	Kilo Gram
kWh	:	kilo-Watt Hour
kWp	:	Kilo Watt Peak
Qty	:	Quantity
MT	:	Metric Ton
CO_2	:	Carbon Di Oxide

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

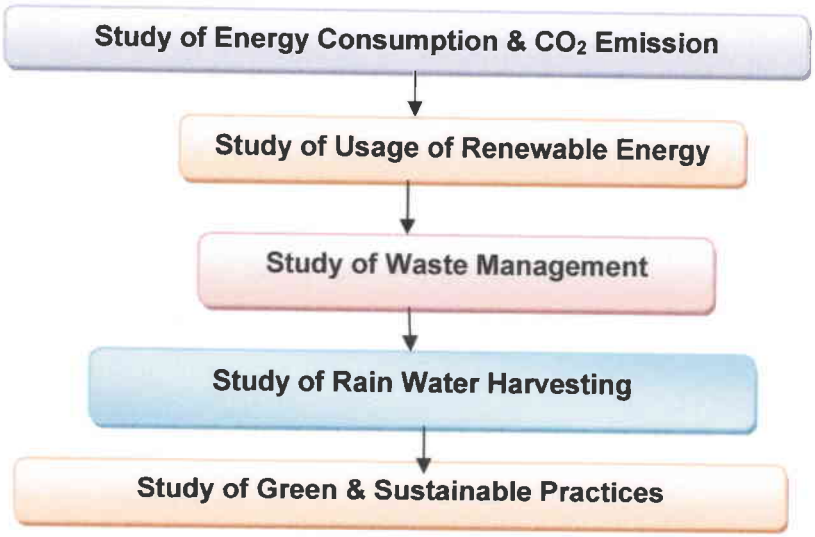
Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41...

CHAPTER-I
INTRODUCTION

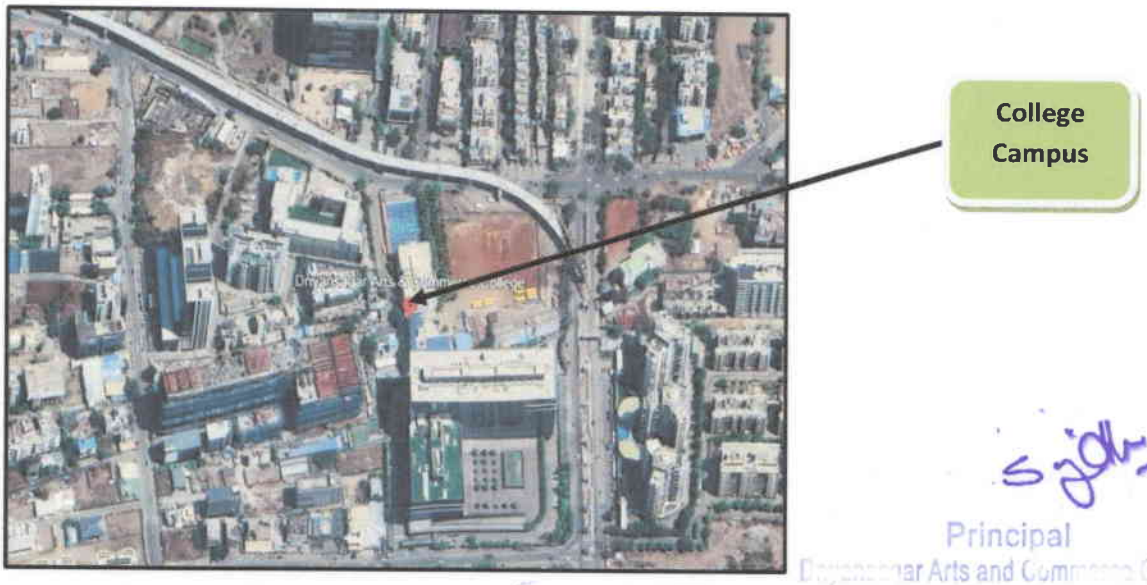
1.1 Introduction:

A Green Audit is conducted at Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune

1.2 Audit Procedural Steps:



1.3 College Location Image:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

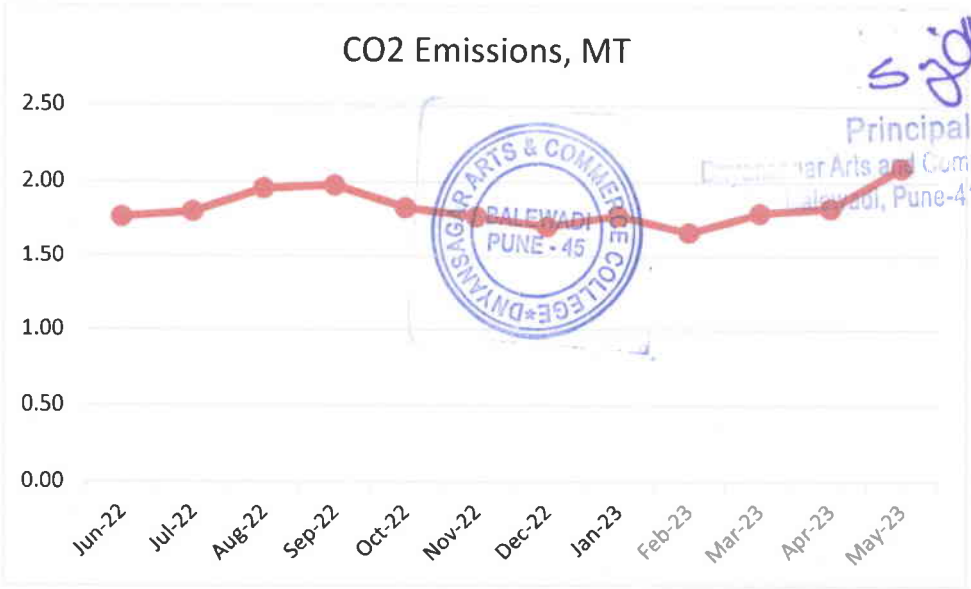
CHAPTER-II
STUDY OF ENERGY CONSUMPTION & CO_2 EMISSION

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO_2 Emissions: 1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere.

Table No 1: Month wise Energy Consumption & CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Jun-22	1965	1.77
2	Jul-22	2005	1.80
3	Aug-22	2178	1.96
4	Sep-22	2201	1.98
5	Oct-22	2036	1.83
6	Nov-22	1970	1.77
7	Dec-22	1896	1.71
8	Jan-23	1978	1.78
9	Feb-23	1850	1.67
10	Mar-23	1997	1.80
11	Apr-23	2036	1.83
12	May-23	2335	2.10
13	Total	24447	22.00
14	Maximum	2335	2.10
15	Minimum	1850	1.67
16	Average	2037.25	1.83

Chart No 1: Month wise CO_2 Emissions:



CHAPTER-III
STUDY OF USAGE OF RENEWABLE ENERGY

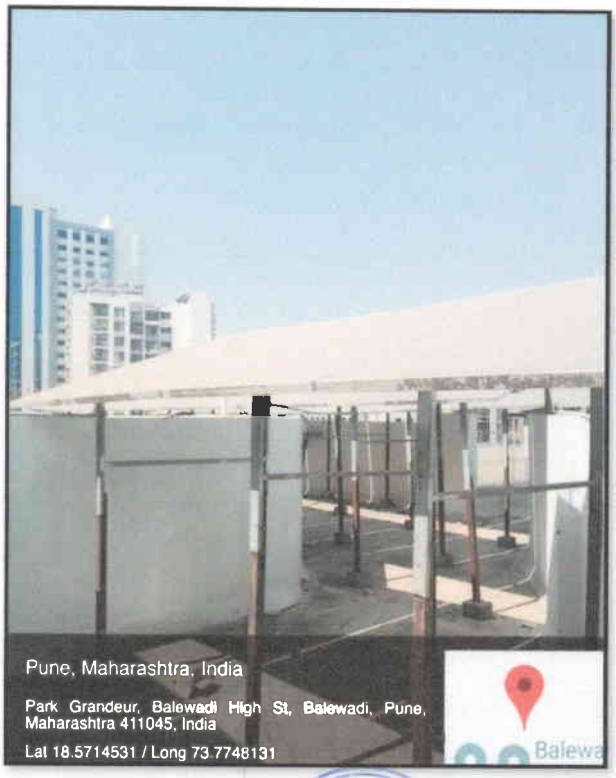
The College has installed Roof Top Solar PV Plant of Capacity **5 kWp**.

In the following Table, we compute the Annual Reduction in CO_2 Emissions due to installation of Roof Top Solar PV Plant.

Table No 4: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	5	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy generation Days	300	Nos
4	Energy Generated in the Year: 22-23	**6000**	kWh
5	1 kWh of Electrical Energy saves	**0.9**	Kg/kWh
6	**Qty of CO_2 Saved by Solar PV Plant =(4)*(5) /1000**	**5.4**	**MT of CO_2**

Photograph of Roof Top Solar PV Plant:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-IV
STUDY OF WASTE MANAGEMENT

4.1 Segregation of Waste at Source:

The waste is segregated at source. Waste collection bins are kept at various locations.

Photograph of Waste Collection Bin:

4.2 Organic Waste:

The College has installed Bio Composting Bed for conversion of Organic Waste.

Photograph of Bio Composting Bed:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41...

BALEWADI PUNE - 45 DNYANSAGAR ARTS COMMERCE COLLEGE

4.3 Sanitary Waste Management:

The College has installed a Sanitary Waste Incinerator to dispose of the Sanitary Waste.

Photograph of Sanitary Waste Incinerator:

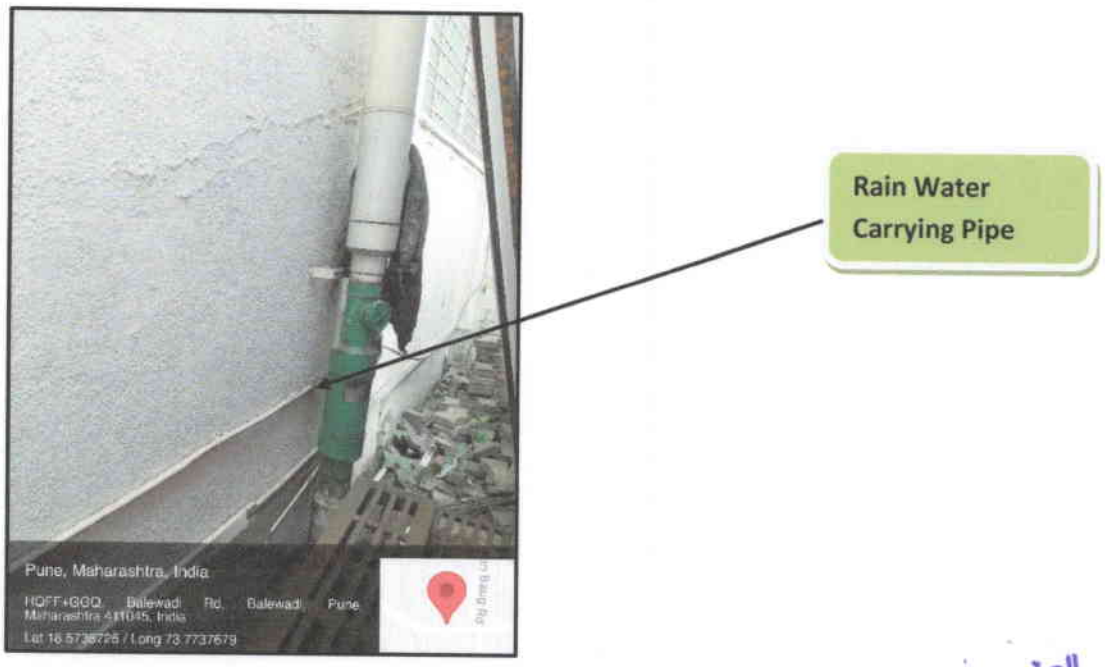
Principal
Dnyansagar Arts and Commerce College,
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-V
STUDY OF RAIN WATER MANAGEMENT

The College has installed the Rain Water Harvesting Project. The Rain Water falling on the terrace is used to increase the Underground Water table.

Photograph of Rain Water Collecting Pipe:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Road:

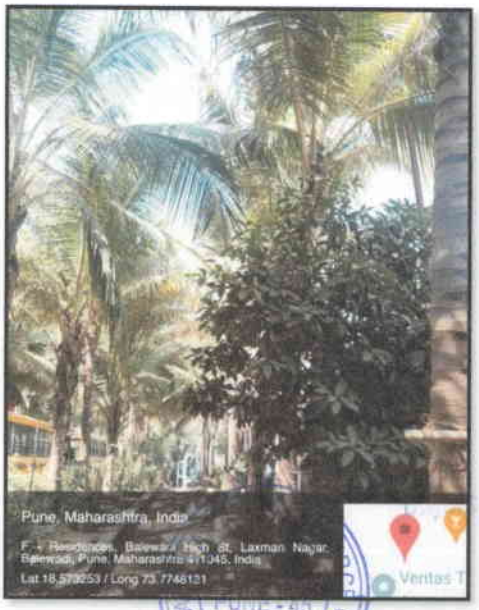
The College has well maintained internal road as to facilitate the easy movement of the students within the campus.

Photograph of Road within campus:

7.2 Plantation in the Campus:

The College has well maintained Tree Plantation, inside the campus.

Photograph of Internal Tree Plantation:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045

7.3 Provision of Ramp for Divyangajan:

The College has made provision of Ramp for easy movement of Divyangajan.

Photograph of Ramp:

7.4 Creation of Awareness on Plastic Free Campus:

In order to create awareness, the College has displayed Posters on Plastic Free Campus

Photograph of Poster on Plastic Free Campus:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 020-24220747 Email: engress123@gmail.com

Ref: ES/ DIMR/21-22/02 Date: 11/6/2022

CERTIFICATE

This is to certify that we have conducted Green Audit at Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, in the Academic year 2021-22.

The College has adopted following Green Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 5 kWp
- Segregation of Waste at source
- Provision of Bio Composting Bed, for conversion of Organic Waste
- Implementation of Rain Water Management Project
- Good internal Road within the campus
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of Awareness on Water 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 Energy Efficient & Green.

For Engress Services,

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

ENGRESS SERVICES * PUNE *

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

GREEN AUDIT REPORT

of

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2021-22

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

Prepared by

ENGRESS SERVICES

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

REGISTRATION CERTIFICATES

Regn. No. EA-8192

No. 2942

National Productivity Council

(National Certifying Agency)

PROVISIONAL CERTIFICATE

Achyut Yashavant Mehendale

Yashavant

He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

Place : Chennai, India

Controller of Examination

BEE AUDITOR CERTIFICATE

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency

CERTIFICATE OF REGISTRATION

FOR CLASS 'A'

Name and Address of the firm

Registration Category

Registration Number

General Manager (EC)

MEDA EMPANELMENT CERTIFICATE

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

Pankaj R. Dharkar

GEM CP 22/788

Deepak Sood

ASSOCHAM GEM CP CERTIFICATE

Principal

Dnyansagar Arts and Commerce College

Balewadi, Pune-411045

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE-45

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, for awarding us the assignment of Green Audit of their Baner campus for the Academic Year: 2021-22.

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

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment.

2. Present Energy Consumption & CO_2 Emission:

No	Parameter	Energy consumed, kWh	CO_2 Emissions, MT
1	Total	16689	15.02
2	Maximum	2012	1.81
3	Minimum	989	0.89
4	Average	1390.75	1.25

3. Usage of Renewable Energy & Reduction in CO_2 Emissions:

- Energy Generated by Roof Top Solar PV Plant of Capacity **5 kWp** is **6000 kWh**
- Reduction in CO_2 Emissions in 2021-22 is **5.4 MT**

4. Waste Management:

5.1 Segregation of Waste at Source:

The waste is segregated at source. Waste collection bins are provided at key locations.

5.2 Organic Waste Management:

The College has made provision of a Bio Composting Bed, for conversion of Organic Waste.

6. Rain Water Management:

The College has installed the Rain Water Management Project. The Rain Water falling on the terrace is used to increase the underground Water Table.

7. Green & Sustainable Practices:

- Well-Maintained Internal Road & Tree Plantation
- Provision of Ramp for Divyangajan
- Creation of Awareness on Water Conservation

6. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere
2. Average Energy generated by Solar PV Plant is **4 kWh/kWp/Day**
3. Annual Solar Energy Generation Days in 2021-22 is **300 Nos**

7. References:

- For CO_2 Emissions: www.tatapower.com
- For Solar PV Energy generation: www.solarrooftop.gov.in

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE PUNE - 45

ABBREVIATIONS

LED	:	Light Emitting Diode
KLPD	:	Kilo Liters per Day
Kg	:	Kilo Gram
kWh	:	kilo-Watt Hour
kWp	:	Kilo Watt Peak
Qty	:	Quantity
MT	:	Metric Ton
CO_2	:	Carbon Di Oxide

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-I
INTRODUCTION

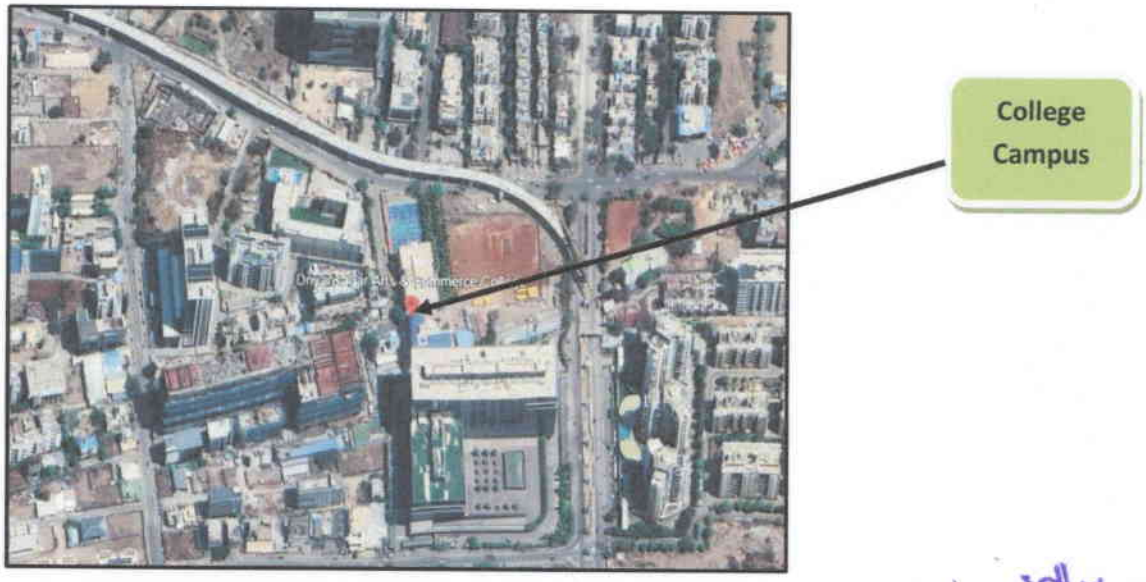
1.1 Objectives:

1. To study the present Energy Consumption
2. To study CO_2 emissions
3. To study usage of Renewable Energy
4. To study Waste Management
5. To study Rain Water Management
6. To study Green & Sustainable Practices

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name	Dnyansagar Arts & Commerce College
2	Address	SKP Campus, Baner-Balewadi Road, Baner, Pune-411045
3	Year of Establishment	2008

1.3 Google Earth Image:



DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045

CHAPTER-II
STUDY OF ELECTRICAL ENERGY CONSUMPTION

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

Table No2: Electrical Bill Analysis- 2021-22:

No	Month	Energy Purchased, kWh
1	Jun-21	1185
2	Jul-21	1006
3	Aug-21	989
4	Sep-21	1025
5	Oct-21	1136
6	Nov-21	1368
7	Dec-21	1458
8	Jan-22	1236
9	Feb-22	1598
10	Mar-22	1698
11	Apr-22	2012
12	May-22	1978
13	Total	16689
14	Maximum	2012
15	Minimum	989
16	Average	1390.75

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

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-III
CARBON FOOTPRINTING

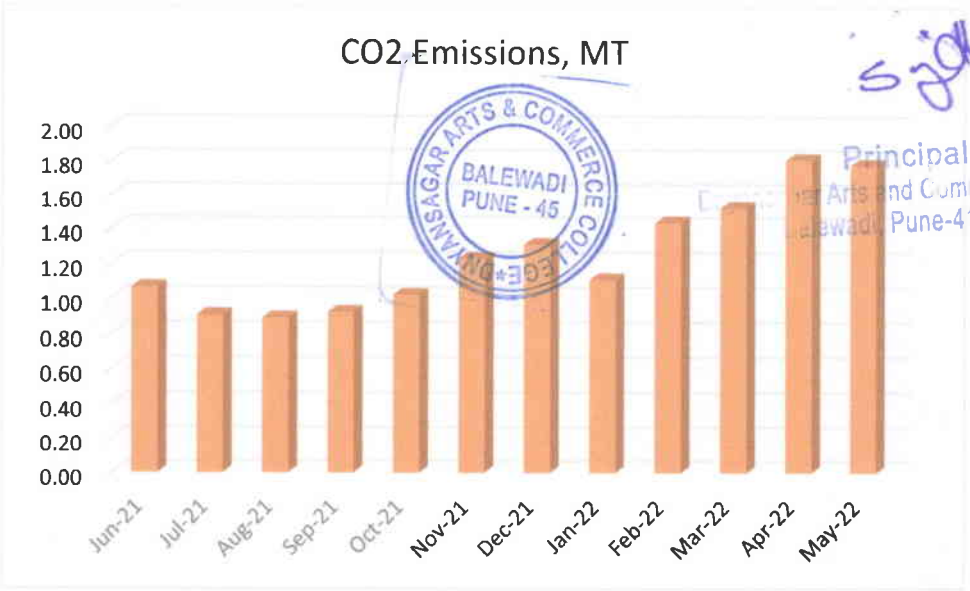
A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO_2 Emissions:**

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

Table No 3: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Jun-21	1185	1.07
2	Jul-21	1006	0.91
3	Aug-21	989	0.89
4	Sep-21	1025	0.92
5	Oct-21	1136	1.02
6	Nov-21	1368	1.23
7	Dec-21	1458	1.31
8	Jan-22	1236	1.11
9	Feb-22	1598	1.44
10	Mar-22	1698	1.53
11	Apr-22	2012	1.81
12	May-22	1978	1.78
13	Total	16689	15.02
14	Maximum	2012	1.81
15	Minimum	989	0.89
16	Average	1390.75	1.25

Chart No 2: Representation of Month wise CO_2 emissions:



CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

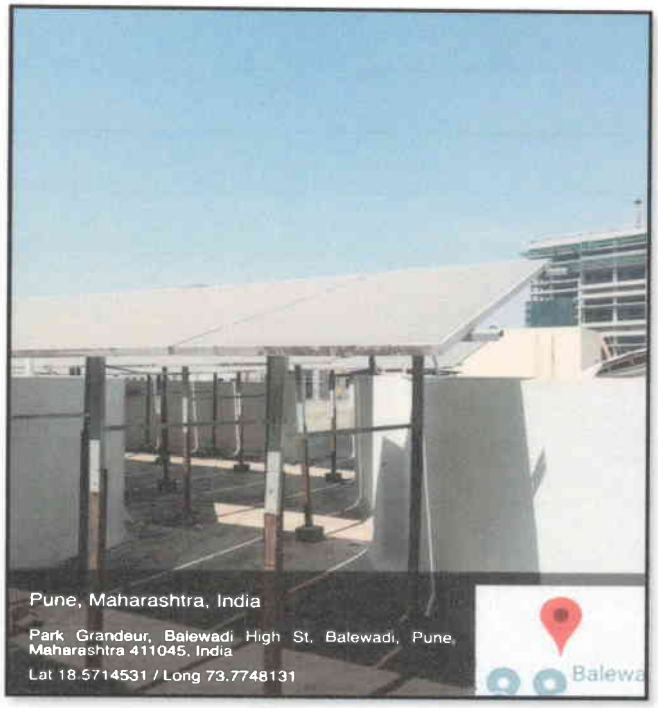
The College has installed Roof Top Solar PV Plant of Capacity 5 kWp.

In the following Table, we compute the Annual Reduction in CO_2 Emissions due to installation of Roof Top Solar PV Plant.

Table No 4: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	5	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy Generation Days	300	Nos
4	Energy Generated in the Year: 21-22	**6000**	kWh
5	1 kWh of Electrical Energy saves	**0.9**	Kg/kWh
6	**Qty of CO_2 Saved by Solar PV Plant = (4)*(5) /1000**	**5.4**	**MT of CO_2**

Photograph of Roof Top Solar PV Plant:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The waste is segregated at source. Separate Dry and Wet waste collection bins are provided at key locations in the campus. It is then further disposed.

Photograph of Waste Collection Bin:

5.2 Organic Waste Management:

The College has arrangement of Bio Composting Bed for disposal of Organic Waste
Photograph of Bio Composting Bed:

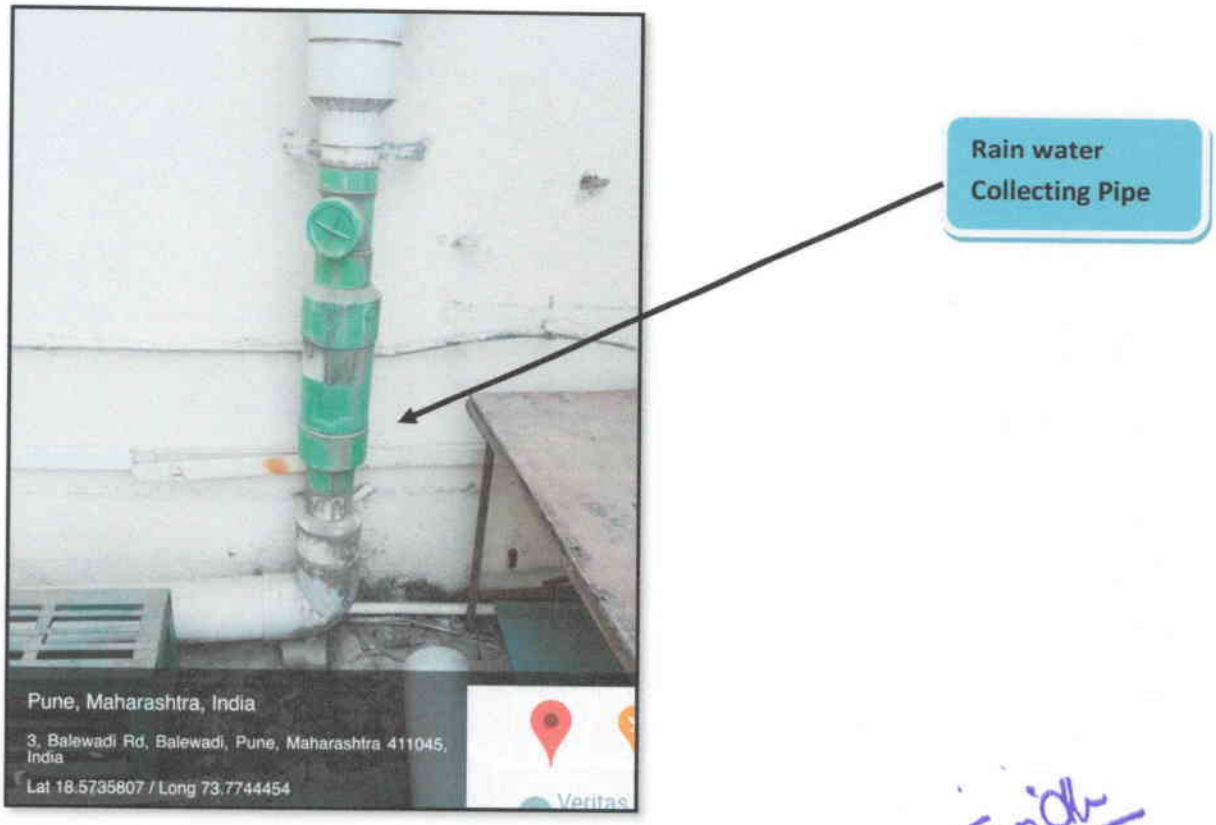
Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

BALEWADI PUNE - 45

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed the Rain Water Management Project. The Rain Water falling on the terrace is used to increase the Underground Water table.

Photograph of Rain Water Collecting Pipe:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 020-24220747 Email: enrichcons@gmail.com

Ref: EC/ DACC/20-21/02

Date: 29/7/2021

CERTIFICATE

This is to certify that we have conducted Green Audit at Dnyansagar Arts & Commerce College, SKP Campus, Baner-Balewadi Road, Baner, Pune-411045, in the Academic year 2020-21.

The College has adopted following Green Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 5 kWp
- Segregation of Waste at source
- Implementation of Rain Water Management Project
- Good internal Road within the campus
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of Awareness on Energy 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 Energy Efficient & Green.

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor,
EA-8192

ENRICH CONSULTANTS * PUNE *

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

GREEN AUDIT REPORT

Of

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2020-21

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

Prepared by

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com

REGISTRATION CERTIFICATES

Regn. No. EA-8192 No. 2942

National Productivity Council
(National Certifying Agency)

PROVISIONAL CERTIFICATE

This is to certify that Mr. / Ms. *Achyut Yashavant Mehendale*
son / daughter of Mr. *Yashavant*
has passed the National Certification Examination for Energy Auditors in April - 2007 conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

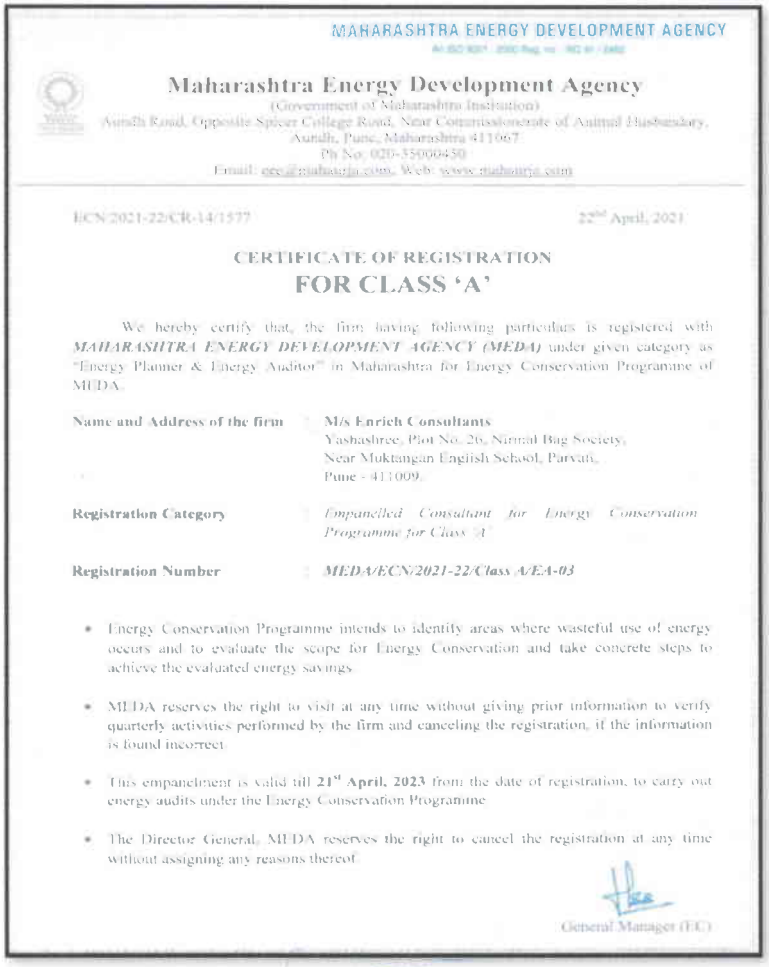
He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India
Date : 10th August 2007

Controller of Examination

BEE ENERGY AUDITOR CERTIFICATE



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: eec@mahaurja.com, Web: www.mahaurja.com

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)

MEDA REGISTRATION CERTIFICATE

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

INDEX

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, for awarding us the assignment of Green Audit of their Baner campus for the Academic Year: 2020-21.

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

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment.

2. Present Energy Consumption & CO_2 Emission:

No	Parameter	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	11837	10.65
2	Maximum	1478	1.33
3	Minimum	568	0.51
4	Average	986.42	0.89

3. Usage of Renewable Energy & Reduction in CO_2 Emissions:

- Energy Generated by Roof Top Solar PV Plant of Capacity **5 kWp** is **6000 kWh**
- Reduction in CO_2 Emissions in 2020-21 is **5.4 MT**

4. Waste Management:

5.1 Segregation of Waste at Source:

The waste is segregated at source. Waste collection bins are provided at key locations in the campus.

5.2 Organic Waste Management:

The College has a Bio Composting Bed, for conversion of Organic Waste

6. Rain Water Management:

The College has installed the Rain Water Management Project. The Rain Water falling on the terrace is used to increase the underground Water Table.

7. Green & Sustainable Practices:

- Maintenance of Well-Maintained Internal Road & Tree Plantation
- Provision of Ramp for Divyangajan
- Creation of Awareness on Energy Conservation by Display of Posters

6. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere
2. Average Energy generated by Solar PV Plant is **4 kWh/kWp/Day**
3. Annual Solar Energy Generation Days in 2020-21 is **300 Nos**

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

7. References:

- For CO_2 Emissions: www.tatapower.com
- For Solar PV Energy generation: www.solarrooftop.gov.in

BALEWADI PUNE - 45

ABBREVIATIONS

LED	:	Light Emitting Diode
KLPD	:	Kilo Liters per Day
Kg	:	Kilo Gram
kWh	:	kilo-Watt Hour
kWp	:	Kilo Watt Peak
Qty	:	Quantity
MT	:	Metric Ton
CO_2	:	Carbon Di Oxide

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study the present Energy Consumption
2. To study CO_2 emissions
3. To study usage of Renewable Energy
4. To study Waste Management
5. To study Rain Water Management
6. To study Green & Sustainable Practices

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name	Dnyansagar Arts & Commerce College
2	Address	SKP Campus, Baner-Balewadi Road, Baner, Pune-411045
3	Year of Establishment	2008

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

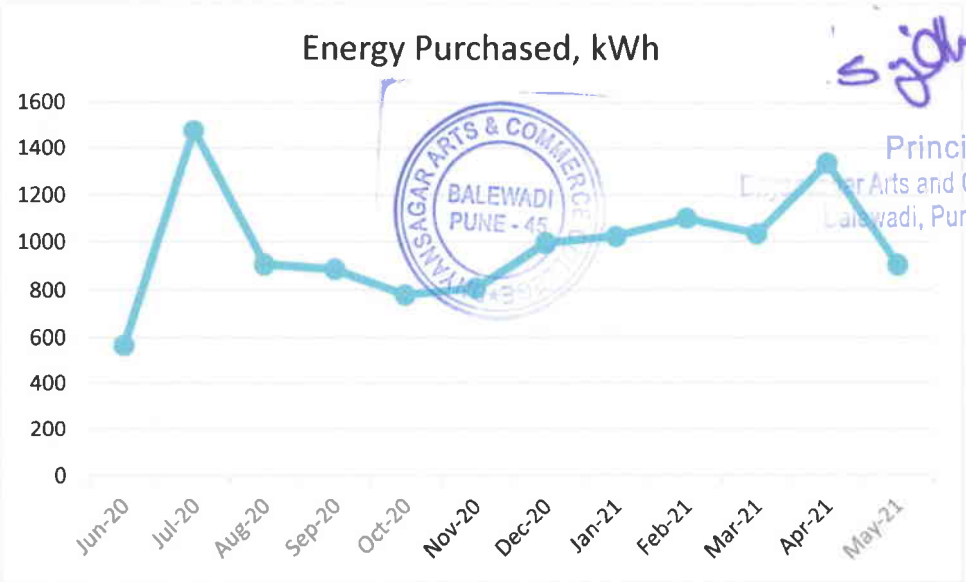
CHAPTER-II
STUDY OF ELECTRICAL ENERGY CONSUMPTION

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

Table No2: Electrical Bill Analysis- 2020-21:

No	Month	Energy Purchased, kWh
1	Jun-20	568
2	Jul-20	1478
3	Aug-20	909
4	Sep-20	889
5	Oct-20	780
6	Nov-20	809
7	Dec-20	997
8	Jan-21	1025
9	Feb-21	1103
10	Mar-21	1036
11	Apr-21	1336
12	May-21	907
13	Total	11837
14	Maximum	1478
15	Minimum	568
16	Average	986.42

Chart No 1: To study the variation of Month wise Energy Purchased, kWh:



CHAPTER-III
CARBON FOOTPRINTING

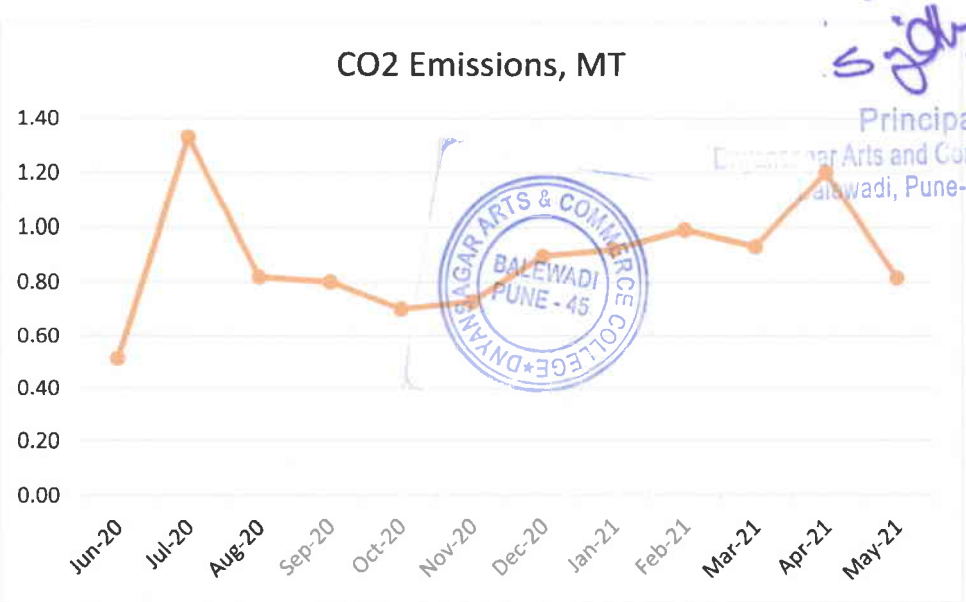
A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO_2 Emissions:**

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

Table No 3: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Jun-20	568	0.51
2	Jul-20	1478	1.33
3	Aug-20	909	0.82
4	Sep-20	889	0.80
5	Oct-20	780	0.70
6	Nov-20	809	0.73
7	Dec-20	997	0.90
8	Jan-21	1025	0.92
9	Feb-21	1103	0.99
10	Mar-21	1036	0.93
11	Apr-21	1336	1.20
12	May-21	907	0.82
13	Total	11837	10.65
14	Maximum	1478	1.33
15	Minimum	568	0.51
16	Average	986.42	0.89

Chart No 2: Representation of Month wise CO_2 emissions:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41[illegible]

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

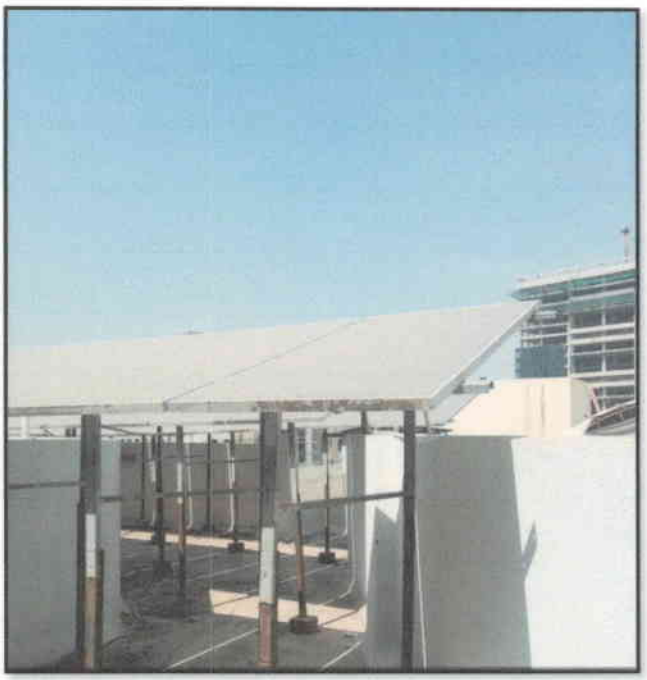
The College has installed Roof Top Solar PV Plant of Capacity **5 kWp**.

In the following Table, we compute the Annual Reduction in CO_2 Emissions due to installation of Roof Top Solar PV Plant.

Table No 4: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	5	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy generation Days	300	Nos
4	Energy Generated in the Year: 20-21	**6000**	kWh
5	1 kWh of Electrical Energy saves	**0.9**	Kg/kWh
6	**Qty of CO_2 Saved by Solar PV Plant =(4)*(5) /1000**	**5.4**	**MT of CO_2**

Photograph of Roof Top Solar PV Plant:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The waste is segregated at source. Separate Dry and Wet waste collection bins are provided at key locations in the campus. It is then further disposed.

Photograph of Waste Collection Bin:

5.2 Organic Waste Management:

The College has arrangement of Bio Composting Bed for disposal of Organic Waste

Photograph of Bio Composting Bed:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

BALEWADI PUNE - 45

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed the Rain Water Management Project. The Rain Water falling on the terrace is used to increase the Underground Water table.

Photograph of Rain Water Collecting Pipe:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

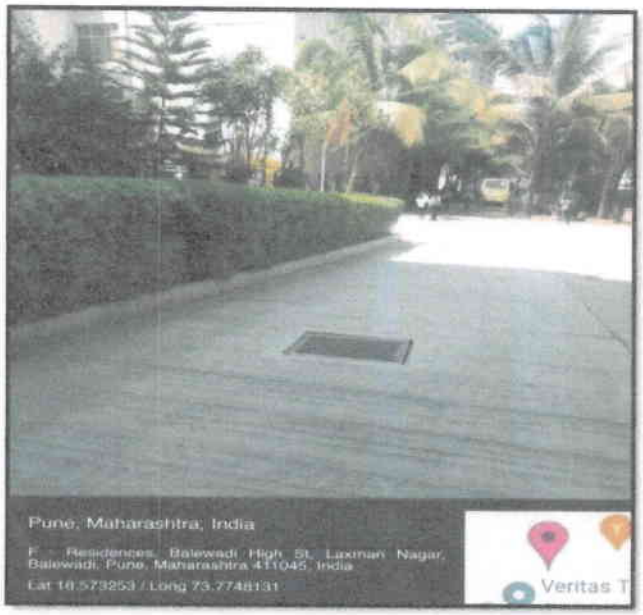
DNYANSAGAR ARTS & COMMERCE COLLEGE
BALEWADI
PUNE - 45

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads:

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

Photograph of Road within campus:



7.2 Plantation in the Campus:

The College has well maintained Garden, inside the campus.

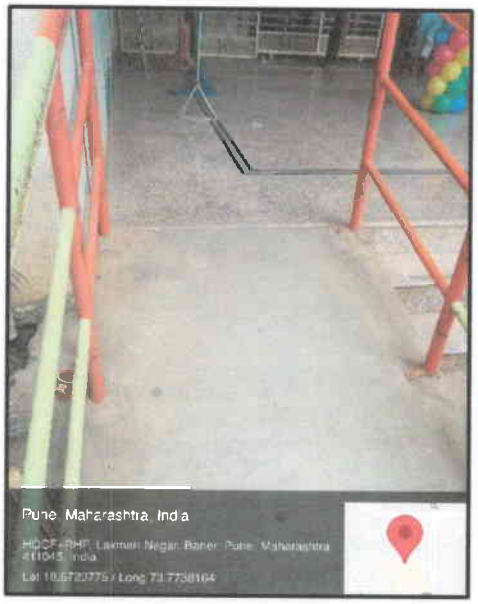
Photograph of Internal Lawn and Tree Plantation:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

7.3 Provision of Ramp for Divyangajan:

The College has made provision of Ramp for easy movement of Divyangajan.

Photograph of Ramp:



7.4 Creation of Awareness on Save Water:

In order to create awareness, the College has displayed Posters on Save Water.

Photograph of Poster on Save Water:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads:

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

Photograph of Road within campus:

7.2 Plantation in the Campus:

The College has well maintained Garden, inside the campus.

Photograph of Internal Lawn and Tree Plantation:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41

BALEWADI PUNE-45 DNYANSAGAR ARTS & COMMERCE COLLEGE

7.3 Provision of Ramp for Divyangajan:

The College has made provision of Ramp for easy movement of Divyangajan.

Photograph of Ramp:

7.4 Creation of Awareness on Energy Conservation:

In order to create awareness, the College has displayed Posters on Energy Conservation.

Photograph of Poster on Energy Conservation:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41

DNYANSAGAR ARTS & COMMERCE COLLEGE
BALEWADI
PUNE - 45

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411 009
Tel: 020-24220747 Email: enrichcons@gmail.com

Ref: EC/ DACC/19-20/02

Date: 12/8/2020

CERTIFICATE

This is to certify that we have conducted Green Audit at Dnyansagar Arts & Commerce College, SKP Campus, Baner-Balewadi Road, Baner, Pune-411045, in the Academic year 2019-20.

The College has adopted following Green Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 5 kWp
- Segregation of Waste at source
- Implementation of Rain Water Management Project
- Good internal Road within the campus
- 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 Energy Efficient & Green.

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor,
EA-8192

ENRICH CONSULTANTS * PUNE *

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41

GREEN AUDIT REPORT

Of

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2019-20

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

Prepared by

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com

ENRICH CONSULTANTS

REGISTRATION CERTIFICATES

Regn. No. EA-8192 No. 2942

National Productivity Council
(National Certifying Agency)

PROVISIONAL CERTIFICATE

This is to certify that Mr. / Ms. Achyut Yashavant Mehendale
son / daughter of Mr. Yashavant
has passed the National Certification Examination for Energy Auditors in April - 2007, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India
Date : 10th August 2007

Controller of Examination

BEE ENERGY AUDITOR CERTIFICATE

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006.
Ph No. 020-26614493 / 26614403
Email: eesc@mahaurja.com, Web: www.mahaurja.com

ECN/2018-19/CR-05/4174 19th September , 2018

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 : **Enrich Consultants**
Yashashree, Plot No. 76, Nirmal Bag Society,
Near Muktangan English School,
Parvati, Pune - 411009.

Registration Category : Empanelled *Consultant for Energy Conservation Programme*

Registration Number : ***MEDA/ECN/CR-05/2018-19/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 the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **31st March 2021** 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.

(Smita Kudarikar)
General Manager (I/C)

MEDA EMPANELMENT CERTIFICATE

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045

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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College,
Balewadi, Pune-411045.

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, for awarding us the assignment of Green Audit of their Baner campus for the Academic Year: 2019-20.

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

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE
BALEWADI
PUNE - 45

EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment.

2. Present Energy Consumption & CO_2 Emission:

No	Parameter	Energy consumed, kWh	CO_2 Emissions, MT
1	Total	19886	17.90
2	Maximum	2157	1.94
3	Minimum	568	0.51
4	Average	1657.17	1.49

3. Usage of Renewable Energy & Reduction in CO_2 Emissions:

- Energy Generated by Roof Top Solar PV Plant of Capacity is **6000 kWh**
- Reduction in CO_2 Emissions in 2019-20 is **5.4 MT**

4. Waste Management:

5.1 Segregation of Waste at Source:

The waste is segregated at source. Waste collection bins are provided at key locations in the campus.

6. Rain Water Management:

The College has installed the Rain Water Management Project. The Rain Water falling on the terrace is used to increase the underground Water Table.

7. Green Practices:

- Maintenance of Well-Maintained Internal Road
- Internal Tree Plantation

6. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere
2. Average Energy generated by Solar PV Plant is **4 kWh/kWp/Day**
3. Annual Solar Energy Generation Days in 2019-20 is **300 Nos**

7. References:

- For CO_2 Emissions: www.tatapower.com
- For Solar PV Energy generation: www.solarrooftop.gov.in

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ABBREVIATIONS

AC	:	Air conditioner
MSEDCL	:	Maharashtra Energy Distribution Company Limited
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
PC	:	Personal Computer
MT	:	Metric Ton

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study the present Energy Consumption
2. To study CO_2 emissions
3. To study usage of Renewable Energy
4. To study Waste Management
5. To study Rain Water Management
6. To study Green Practices

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name	Dnyansagar Arts & Commerce College
2	Address	SKP Campus, Baner-Balewadi Road, Baner, Pune-411045
3	Year of Establishment	2008

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-II
STUDY OF ELECTRICAL ENERGY CONSUMPTION

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

Table No2: Electrical Bill Analysis- 2019-20:

No	Month	Energy Purchased, kWh
1	Jun-19	2018
2	Jul-19	1980
3	Aug-19	1658
4	Sep-19	1798
5	Oct-19	1870
6	Nov-19	1960
7	Dec-19	1908
8	Jan-20	2036
9	Feb-20	2157
10	Mar-20	1365
11	Apr-20	568
12	May-20	568
13	Total	19886
14	Maximum	2157
15	Minimum	568
16	Average	1657.17

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

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41...

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-III
CARBON FOOTPRINTING

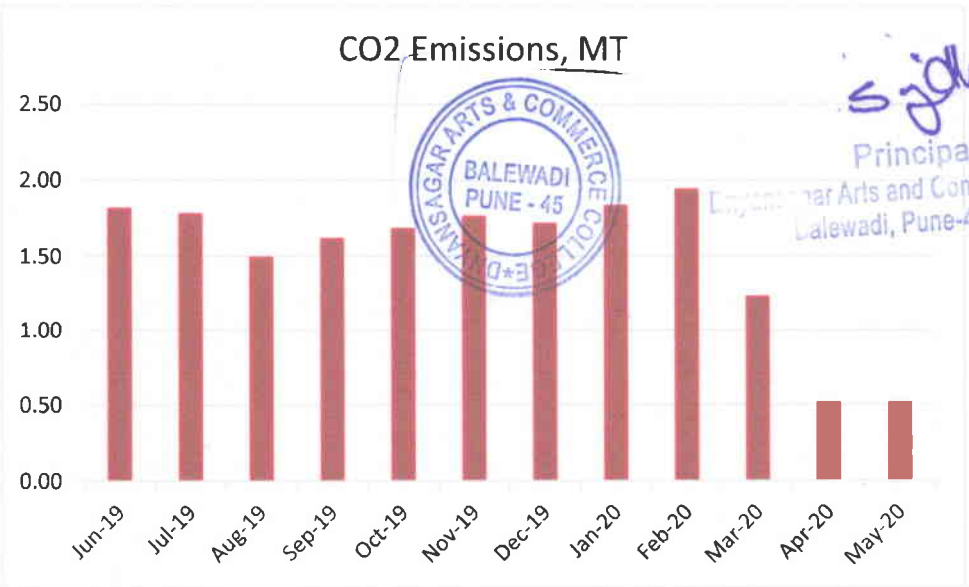
A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. **Basis for computation of CO_2 Emissions:**

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

Table No 3: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO2 Emissions, MT
1	Jun-19	2018	1.82
2	Jul-19	1980	1.78
3	Aug-19	1658	1.49
4	Sep-19	1798	1.62
5	Oct-19	1870	1.68
6	Nov-19	1960	1.76
7	Dec-19	1908	1.72
8	Jan-20	2036	1.83
9	Feb-20	2157	1.94
10	Mar-20	1365	1.23
11	Apr-20	568	0.51
12	May-20	568	0.51
13	Total	19886	17.90
14	Maximum	2157	1.94
15	Minimum	568	0.51
16	Average	1657.17	1.49

Chart No 2: Representation of Month wise CO_2 emissions:



CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

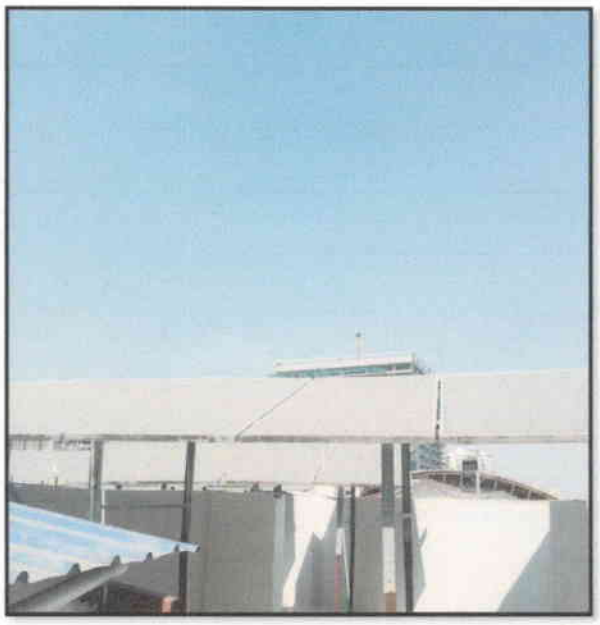
The College has installed Roof Top Solar PV Plant of Capacity **5 kWp**.

In the following Table, we compute the Annual Reduction in CO_2 Emissions due to installation of Roof Top Solar PV Plant.

Table No 4: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	5	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy generation Days	300	Nos
4	Energy Generated in the Year: 19-20	**6000**	kWh
5	1 kWh of Electrical Energy saves	**0.9**	Kg/kWh
6	**Qty of CO_2 Saved by Solar PV Plant =(4)*(5) /1000**	**5.4**	**MT of CO_2**

Photograph of Roof Top Solar PV Plant:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41...

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The waste is segregated at source. Separate Dry and Wet waste collection bins are provided at key locations in the campus. It is then further disposed.

Photograph of Waste Collection Bin:

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed the Rain Water Management Project. The Rain Water falling on the terrace is used to increase the Underground Water table.

Photograph of Rain Water Carrying Pipe:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41[illegible]

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-VII
STUDY OF GREEN PRACTICES

7.1 Pedestrian Friendly Roads:

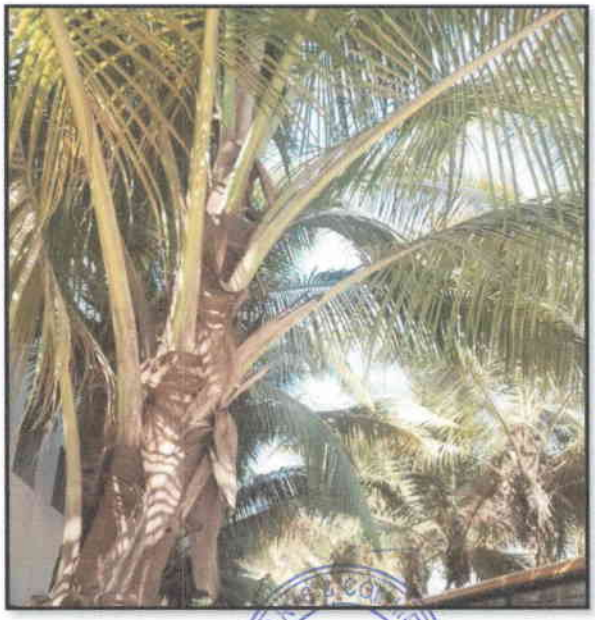
The College has well maintained internal road as to facilitate the easy movement of the students within the campus.

Photograph of Road within campus:

7.2 Plantation in the Campus:

The College has well maintained Tree Plantation, inside the campus.

Photograph of Internal Tree Plantation:



Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

BALEWADI PUNE - 45

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Muktangan English School,
Parvati, Pune 411 009 Tel: 09890444795 Email: engress123@gmail.com
UDYAM Regn. No: UDYAM-MH-26-0135636,
MEDA Regn. No: ECN/2023-24/CR-43/1709
ISO: 9001-2015 Certified (Cert No: 23EQKC13),
ISO: 14001-2015 Certified (Cert No: 23EEKW20)

ENVIRONMENTAL AUDIT CERTIFICATE

Certificate No: ES/DACC/23-24/03 **Date: 18/7/2024**

This is to certify that we have conducted Environmental Audit at Dnyansagar Arts & Commerce College, SKP Campus, Baner-Balewadi Road, Baner, Pune-411045, in the Academic Year 2023-24.

The College has adopted following Eco- Friendly Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 5 kWp
- Segregation of Waste at source
- Provision of Bio Composting Bed, for conversion of Organic Waste
- Provision of Sanitary Waste Incinerator for Sanitary Waste
- Implementation of Rain Water Management Project
- Tree Plantation in the campus
- Creation of Awareness on Water 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 & Eco Friendly.

For Engress Services,

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

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ENGRESS SERVICES PUNE

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-45

EGAC Accredited

ENVIRONMENTAL AUDIT REPORT

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2023-24

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411...

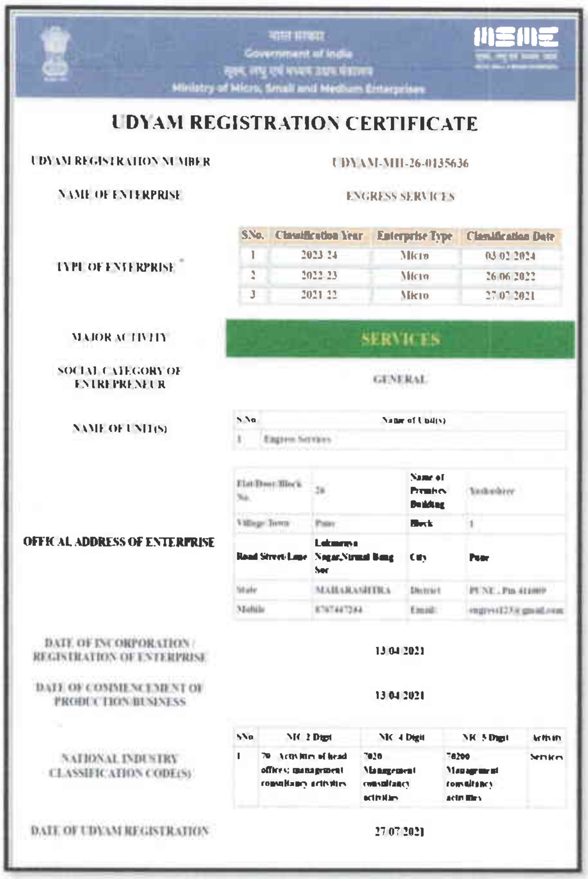
Prepared by:

ENGRESS SERVICES

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

ENGRESS SERVICES PUNE

Registration Certificates: UDYAM, MEDA, ASSOCHAM GEM-CP, ISO: 9001 & 14001:


Government of India
Ministry of Micro, Small and Medium Enterprises

UDYAM REGISTRATION CERTIFICATE

UDYAM REGISTRATION NUMBER	UDYAM-MH-26-0135636
NAME OF ENTERPRISE	ENGRESS SERVICES
TYPE OF ENTERPRISE	see table below
MAJOR ACTIVITY	SERVICES
SOCIAL CATEGORY OF ENTREPRENEUR	GENERAL
NAME OF UNIT(S)	1. Engress Services
DATE OF INCORPORATION / REGISTRATION OF ENTERPRISE	13/04/2021
DATE OF COMMENCEMENT OF PRODUCTION/BUSINESS	13/04/2021
DATE OF UDYAM REGISTRATION	27/07/2021

SNo.	Classification Year	Enterprise Type	Classification Date
1	2023-24	Micro	03/02/2024
2	2022-23	Micro	26/06/2022
3	2021-22	Micro	27/07/2021

OFFICIAL ADDRESS OF ENTERPRISE

Flat/Door/Block No.	26	Name of Premises/ Building	Yashashree
Village/Town	Pune	Block	1
Road/Street/Lane	Lokmanya Nagar,Nirmal Baug Soc	City	Pune
State	MAHARASHTRA	District	PUNE, Pin 411009
Mobile	8767447244	Email:	engress123@gmail.com

NATIONAL INDUSTRY CLASSIFICATION CODE(S)

SNo.	NIC 2 Digit	NIC 4 Digit	NIC 5 Digit	Activity
1	70 - Activities of head offices; management consultancy activities	7020 - Management consultancy activities	70200 - Management consultancy activities	Services


Maharashtra Energy Development Agency

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts & Commerce College
Balewadi, Pune-411045.

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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College,
Balewadi, Pune-411045.

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, for awarding us the assignment of Environmental Audit of their Baner campus for the Academic Year: 2023-24.

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

EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment.

2. Pollution due to College Activities:

- **Air pollution:** Mainly CO_2 on account of Electricity Consumption
- **Solid Waste:** Bio degradable Garden Waste
- **Liquid Waste:** Human liquid waste

3. Present Energy Consumption & CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Purchased	**25260**	kWh
2	Annual CO_2 Emissions	**23.49**	MT

4. Renewable Energy Usage & Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Solar PV Plant Capacity	**5**	kWp
2	Energy generated in 23-24	**6000**	kWh
3	Reduction in Annual CO_2 Emissions	**5.58**	MT

5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	**46**	**26**	**32**
2	Minimum	**40**	**23**	**30**

6. Indoor Comfort Conditions:

No	Parameter/Value	Lux Level	Noise Level, dB
1	Maximum	**249**	**46**
2	Minimum	**215**	**42.7**

7. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Organic Waste	Provision of Bio Composting Bed
3	Sanitary Waste	Provision of Sanitary waste Incinerator
4	E Waste	Recommended to dispose of through Authorized Agency

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

8. Rain Water Management:

The Rain water falling on the terrace is used to increase the Underground Water Table.

9. Environment Friendly Initiatives:

1. Tree Plantation in the campus
2. Creation of Awareness on Water Conservation by display of Boards

10. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.93 Kg** of CO_2 into atmosphere
2. **1 kWp** Solar PV system generates **4 kWh** of Electrical Energy per Day
3. Annual Solar Energy Generation Days: **300 Nos**
4. Energy Consumption is computed on the basis of Load Utilization Factor

11. References:

- For CO_2 Emissions: www.ccd.gujarat.gov.in
- For Solar PV Energy generation: www.solarrooftop.gov.in
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI Standards: www.cpcb.com

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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ABBREVIATIONS

Kg	:	Kilo Gram
MSEDCL	:	Maharashtra State Distribution Company Limited
MT	:	Metric Ton
kWh	:	kilo-Watt Hour
LPD	:	Liters per Day
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

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE-45

Principal
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CHAPTER-I
INTRODUCTION

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:

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 Key Study Points:

No	Particulars
1	Study of Present Resource Consumption & CO_2 Emission
2	Study of Usage of Renewable Energy
3	Study of Indoor Air Quality
4	Study of Indoor Lux & Noise Level
5	Study of Water Management
6	Study of Waste Management Practices
7	Study of Environment Friendly Practices

1.4 College Location Image:

Principal
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Balewadi, Pune-41[illegible]

BALEWADI PUNE - 45 DNYANSAGAR COLLEGE

CHAPTER-II

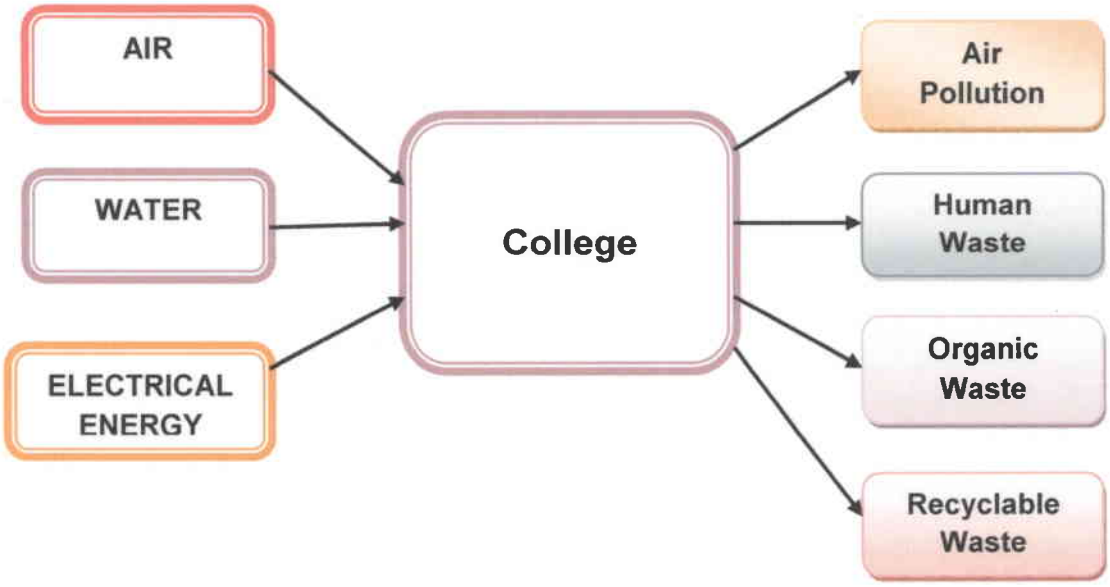
STUDY OF RESOURCE CONSUMPTION & CO_2 EMISSION

The College consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the College System & Environment as under.

Chart No 1: Representation of Resource Requirement & Waste of a College:



Now we compute the Generation of CO_2 on account of consumption of Electrical Energy. The basis of Calculation for CO_2 emissions due to Electrical Energy is as under.

- **1 kWh** of Electrical Energy releases **0.93 Kg of CO_2** into atmosphere

Table No 1: Study of Purchase of Energy & CO_2 Emissions: 23-24:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Jun-23	2290	2.13
2	Jul-23	2315	2.15
3	Aug-23	2015	1.87
4	Sep-23	2445	2.27
5	Oct-23	2635	2.45
6	Nov-23	2085	1.94

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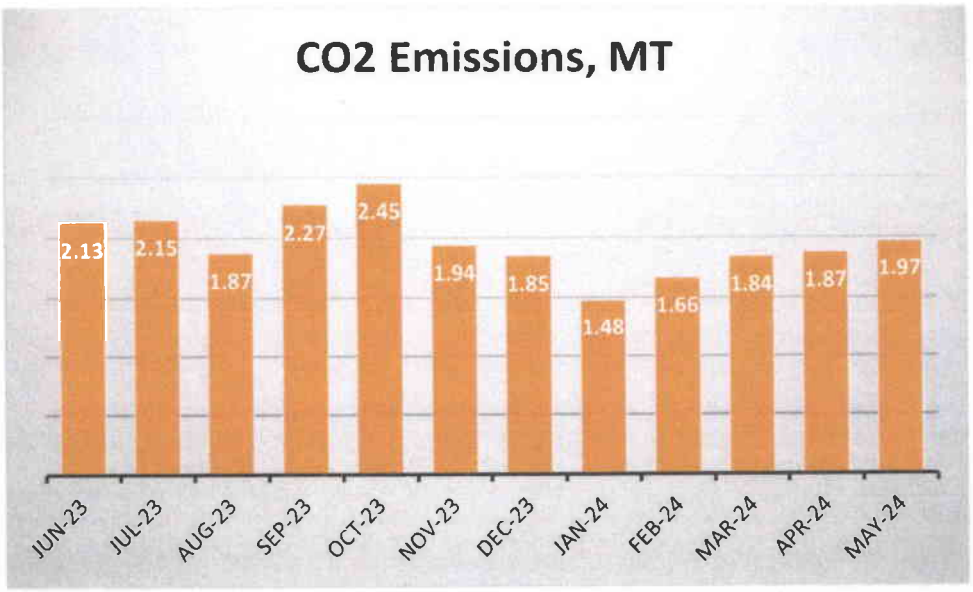
7	Dec-23	1987	1.85
8	Jan-24	1587	1.48
9	Feb-24	1789	1.66
10	Mar-24	1980	1.84
11	Apr-24	2015	1.87
12	May-24	2117	1.97
13	Total	25260	23.49
14	Maximum	2635	2.45
15	Minimum	1587	1.48
16	Average	2105	1.96

Chart No 2: Month wise CO_2 Emissions:



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CHAPTER III
STUDY OF USAGE OF RENEWABLE ENERGY

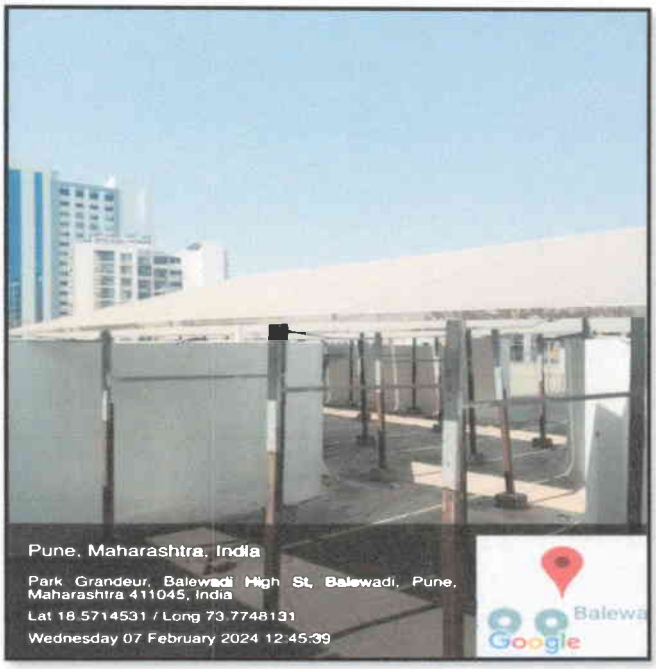
The College has installed Roof Top Solar PV Plant of Capacity **5 kWp**.

In the following Table, we compute the Annual Reduction in CO_2 Emissions due to installation of Roof Top Solar PV Plant.

Table No 2: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	5	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy Generation Days	300	Nos
4	Energy Generated in the Year: 23-24	**6000**	kWh
5	1 kWh of Electrical Energy saves	**0.93**	Kg/kWh
6	**Qty of CO_2 Saved by Solar PV Plant = (4)*(5) /1000**	**5.58**	**MT of CO_2**

Photograph of Roof Top Solar PV Plant:



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CHAPTER IV
STUDY OF INDOOR AIR QUALITY

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

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

3. Air Quality Index: Air Quality Index (AQI) is a number used by government agencies to measure the **Air Pollution** levels and communicate it to the population.

In this Chapter, we present three important Parameters: **AQI**- Air Quality Index, **PM-2.5**- Particulate Matter of Size 2.5 micron and **PM-10**- Particulate Matter of Size 10 micron

Table No 3: Indoor Air Quality Parameters:

No	Location	AQI	PM2.5	PM10
1	Library	43	23	30
2	Classroom	46	26	32
3	Faculty Room	41	24	31
4	Reading Room	40	24	30
5	Seminar Hall	42	23	30
	Maximum	**46**	**26**	**32**
	Minimum	**40**	**23**	**30**

Table No 4: Air Quality Index Values & Concentration of PM 2.5 & PM10: (By CPCB):

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 +

Conclusion:

From the above measured values, we conclude that the observed values of AQI, PM-2.5 & PM-10 are in the **Satisfactory Range**, as per the guidelines given by Central Pollution Control Board.

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CHAPTER V
STUDY OF INDOOR LUX & NOISE PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit. The Parameters include: **Lux Level and Noise Level.**

Table No 5: Study of Indoor Lux & Noise Level Parameters:

No	Location	Lux Level,	Noise Level, dB
1	Library	246	45.1
2	Classroom	236	43
3	Faculty Room	249	44.3
4	Reading Room	215	46
5	Seminar Hall	226	42.7
	Maximum	**249**	**46**
	Minimum	**215**	**42.7**

Recommended Lux & Noise Level: As per BEE & ISHRAE Guidelines:

A) Noise Level Reference:		
No	**Location**	**Noise Level Range, dB**
1	Offices	45-50
2	Occupied Class Room	40-45
3	Libraries	35-40
B) Reference Lux Level, Lumens:		
1	For Class Rooms	**200 Plus**
2	For Reading Rooms	**200 Plus**

Conclusion:

From the above measured values, we conclude that:

- The Noise Level is within the prescribed Limit
- The Lux Level at various locations is Okay

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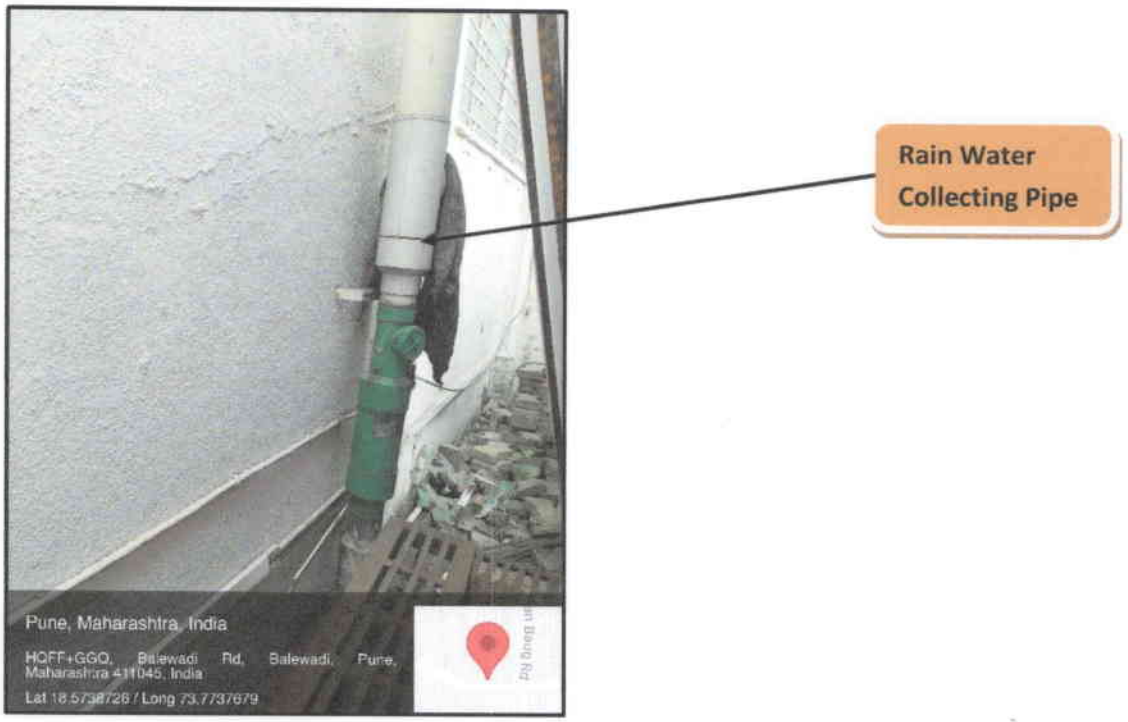
CHAPTER VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed the Rain Water Harvesting Project. The Rain Water falling on the terrace is used to increase the Underground Water table.

Photograph of Rain Water Collecting Pipe:



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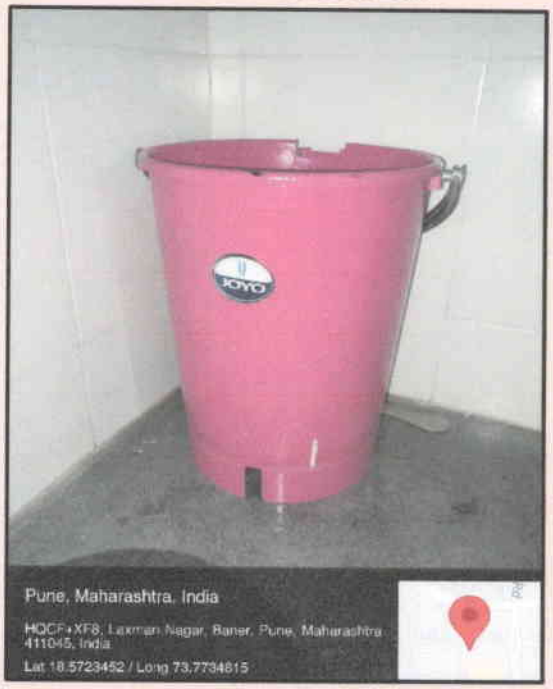
CHAPTER-VII
STUDY OF WASTE MANAGEMENT

In this Chapter, we present the Waste Management Practices, followed by the College.

Details of Waste Management Practices:

No	Head	Observation	Photograph
1	**Solid Waste**	Segregation of Waste at Source: Provision of Waste Collection Bins	**Waste Collection Bin:** 
2	**Organic waste**	Provision of Bio Composting Bed	**Bio Composting Bed:** 

3	**Sanitary Waste**	Provision of Sanitary Waste Incinerator	**Sanitary Waste Incinerator** 
4	**E Waste**	Recommended to dispose of E Waste through Authorized Agency	

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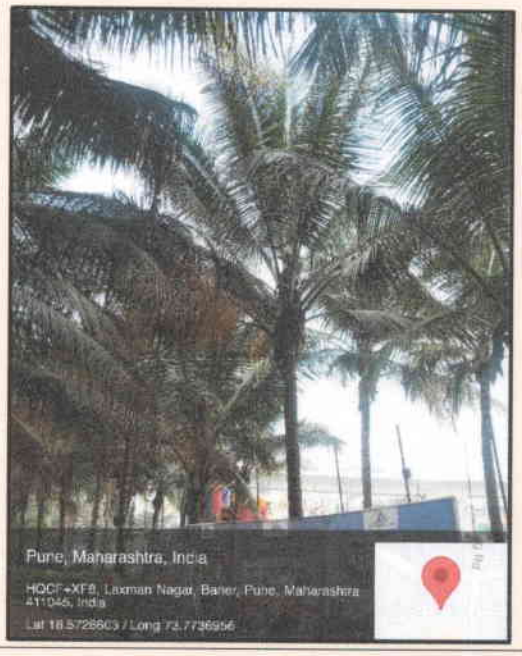
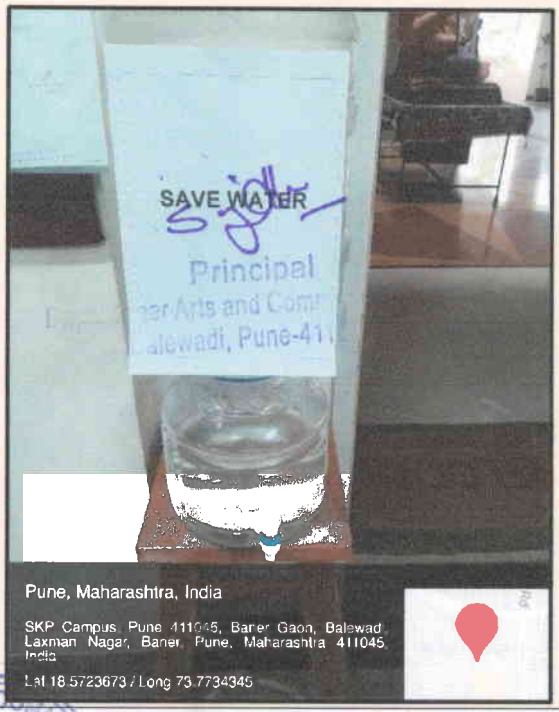
CHAPTER-VIII
STUDY OF ECO-FRIENDLY PRACTICES

In this Chapter, we present the Eco-Friendly Practices, followed by the College.

Details of Eco-Friendly Practices:

No	Head	Observation	Photograph
1	**Tree Plantation**	Internal Tree Plantation in the Campus	**Internal Tree Plantation:** 
2	**Creation of Awareness among Stake Holders**	Display of Poster on Water Conservation	**Poster on Water Conservation:** 

ENGRESS SERVICES

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

ENVIRONMENTAL AUDIT CERTIFICATE

Certificate No: ES/DACC/22-23/03 **Date: 13/7/2023**

This is to certify that we have conducted Environmental Audit at Dnyansagar Arts & Commerce College, SKP Campus, Baner-Balewadi Road, Baner, Pune 411045, in the Academic year 2022-23.

The College has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 5 kWp
- Segregation of Waste at source
- Provision of Bio Composting Bed, for conversion of Organic Waste
- Provision of Sanitary Waste Incinerator for Sanitary Waste
- Implementation of Rain Water Management Project
- Tree Plantation in the campus
- Creation of Awareness on Plastic Free Campus by Display of Posters

We appreciate the support of Management, involvement of faculty members and students in the process of making the campus Environment Friendly.

For Engress Services,

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

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ENGRESS SERVICES PUNE

ENVIRONMENTAL AUDIT REPORT

Of

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2022-23

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Prepared by

ENGRESS SERVICES

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

ENGRESS SERVICES PUNE

REGISTRATION CERTIFICATES

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

MEDA REGISTRATION CERTIFICATE

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

Pankaj R. Dharkar
GEM CP 22/788
Deepak Sood

ASSOCHAM GEM CP CERTIFICATE

Certificate of Registration

This is to Certify that
Quality Management System of

ENGRESS SERVICES

has been assessed and found to conform to the requirements of

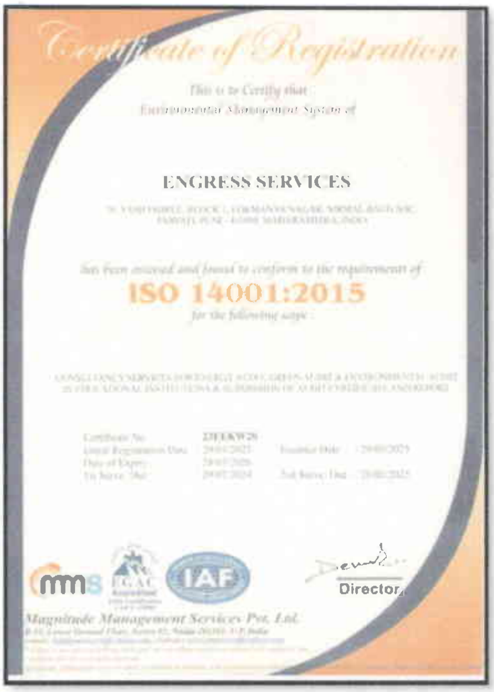
ISO 9001:2015

for the following scope

Director

Magnitude Management Services Pvt. Ltd.

ISO: 9001-2015 CERTIFICATE



Certificate of Registration

This is to Certify that
Environmental Management System of

ENGRESS SERVICES

has been assessed and found to conform to the requirements of

ISO 14001:2015

for the following scope

Director

Magnitude Management Services Pvt. Ltd.

ISO: 14001-2015 CERTIFICATE

DNYANSAGAR ARTS & COMMERCE COLLEGE
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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, for awarding us the assignment of Environmental Audit of their Baner campus for the Academic Year: 2022-23.

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

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment.

2. Pollution due to College Activities:

- **Air pollution:** Mainly CO_2 on account of Electricity Consumption
- **Solid Waste:** Bio degradable Garden Waste, Paper & Plastic Waste
- **Liquid Waste:** Human liquid waste

3. Present Energy Consumption & CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Purchased	**24447**	kWh
2	Annual CO_2 Emissions	**22**	MT

4. Renewable Energy & Reduction in CO_2 Emissions:

- The College has installed Roof Top Solar PV Plant of Capacity **5 kWp.**
- The Energy generated by Solar PV Plant in 22-23 is **6000 kWh.**
- Reduction in CO_2 Emissions in 22-23 is **5.4 MT**

5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	63	37	45
2	Minimum	56	34	38

6. Indoor Comfort Conditions:

No	Parameter/Value	Temperature, ^0C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	28	81	125	45
2	Minimum	27.8	80	110	41.9

7. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Organic Waste	Provision of Bio Composting Bed
3	Sanitary Waste	Provision of Sanitary waste Incinerator

8. Rain Water Management:

The College has installed the Rain Water Management Project. The Rain Water falling on the terrace is used to increase the underground Water Table.

9. Environment Friendly Initiatives:

- Tree Plantation in the campus.
- Creation of awareness on Plastic Free Campus by Display of Posters

10. Assumptions:

1. 1 kWh of Electrical Energy releases 0.9 Kg of CO_2 into atmosphere
2. Energy generated by Roof Top Solar PV Plant: 4 kWh/kWp per Day
3. Annual Solar Energy Generation Days: 300 Nos
4. Energy Consumption is computed on the basis of Load Utilization Factor

11. References:

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- For Solar PV Energy generation: www.solarrooftop.gov.in
- For Various Indoor Air Parameters: www.ishrae.com
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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
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Balewadi, Pune-411045.

ABBREVIATIONS

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MT	:	Metric Ton
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LPD	:	Liters per Day
LED	:	Light Emitting Diode
AQI	:	Air Quality Index
CPCB	:	Central Pollution Control Board
PM	:	Particulate Matter

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

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

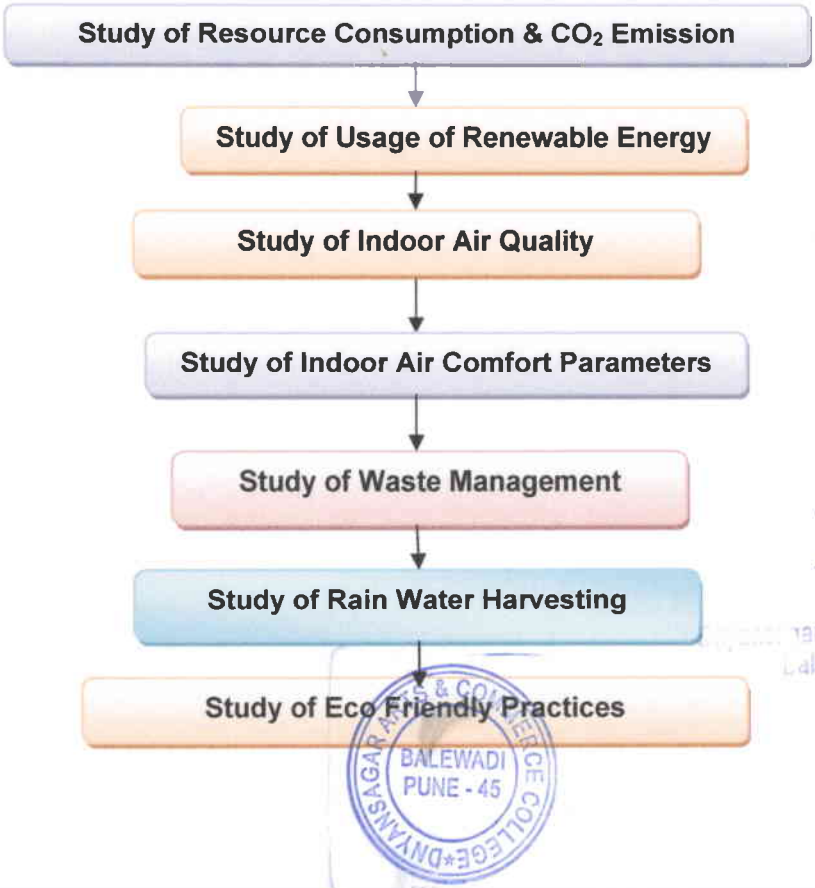
1.2. Environmental Audit: Definition:

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:



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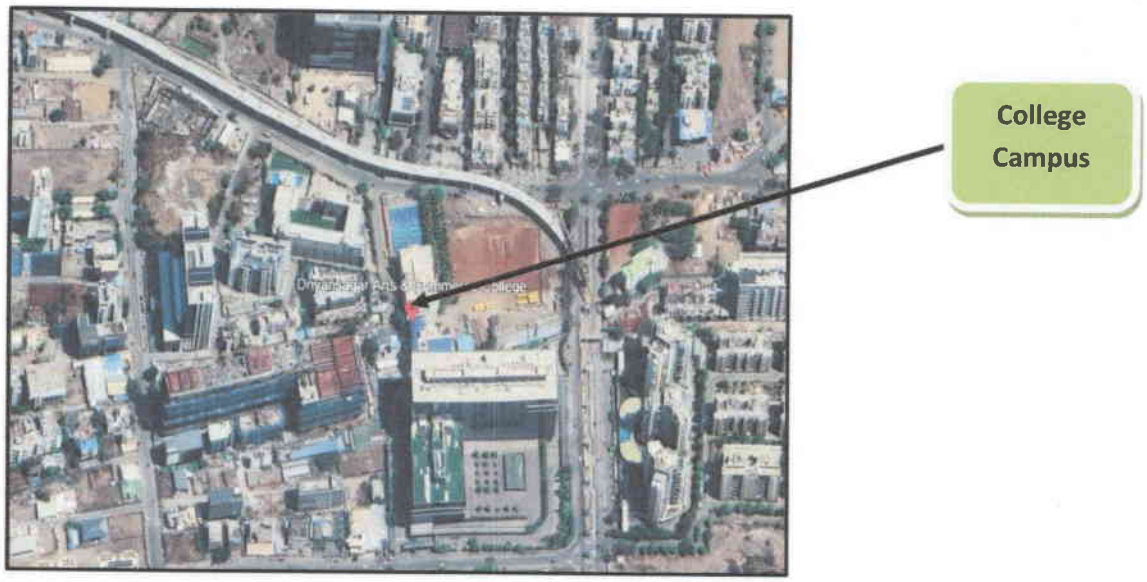
1.5 College Location Image:



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BALEWADI
PUNE

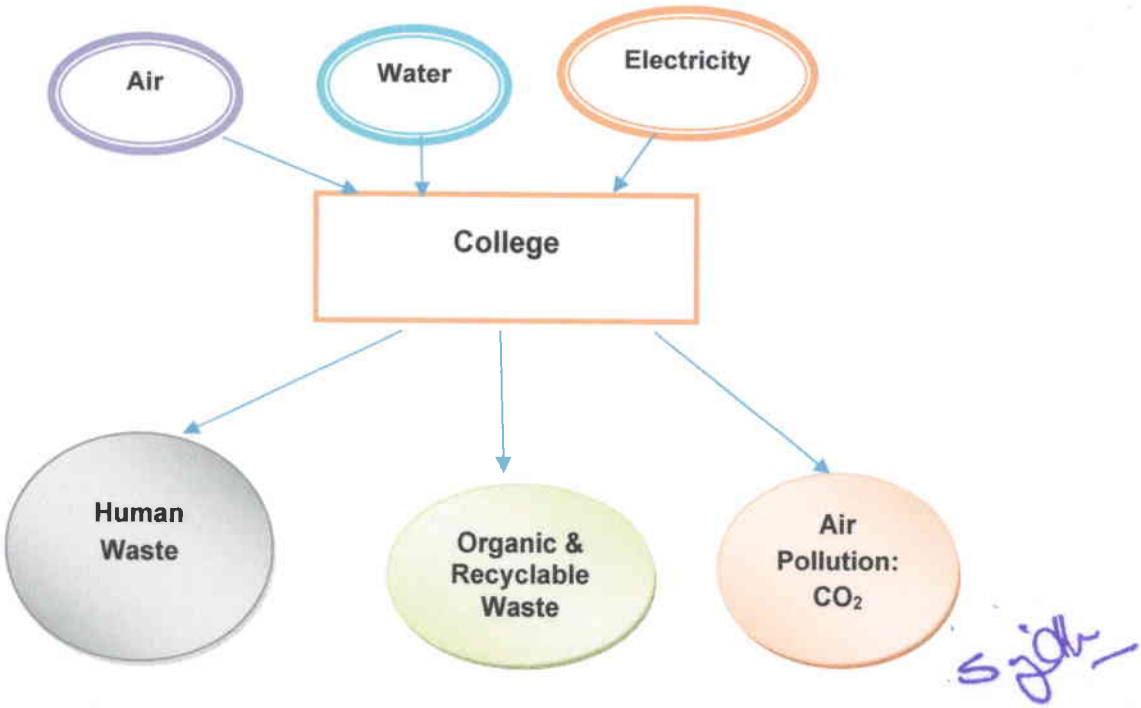
CHAPTER-II
STUDY OF CONSUMPTION OF RESOURCES & CO_2 EMISSION

2.1 The College consumes following Natural/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the College System & Environment as under.

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



2.3 Computation of CO_2 Emissions: A Carbon Foot print is defined as the Total Greenhouse Gas Emissions, emitted due to various activities. The College uses Electrical Energy for various Electrical gadgets& day to day activities.

Basis for computation of CO_2 Emissions:

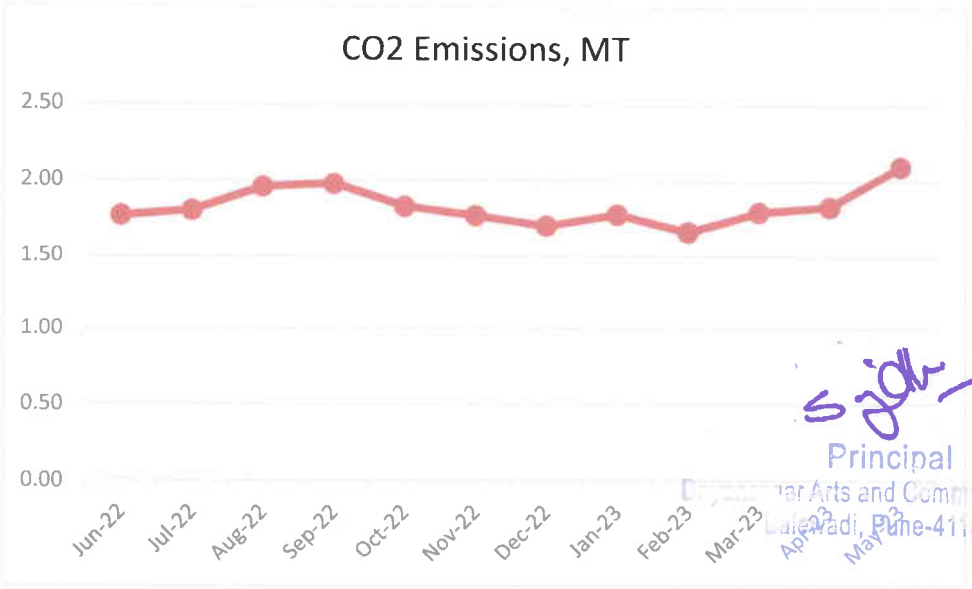
- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Table No 1: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Jun-22	1965	1.77
2	Jul-22	2005	1.80

3	Aug-22	2178	1.96
4	Sep-22	2201	1.98
5	Oct-22	2036	1.83
6	Nov-22	1970	1.77
7	Dec-22	1896	1.71
8	Jan-23	1978	1.78
9	Feb-23	1850	1.67
10	Mar-23	1997	1.80
11	Apr-23	2036	1.83
12	May-23	2335	2.10
13	Total	24447	22.00
14	Maximum	2335	2.10
15	Minimum	1850	1.67
16	Average	2037.25	1.83

Chart No 2: Representation of Month wise CO_2 emissions:



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BALEWADI
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CHAPTER-III
STUDY OF USAGE OF RENEWABLE ENERGY

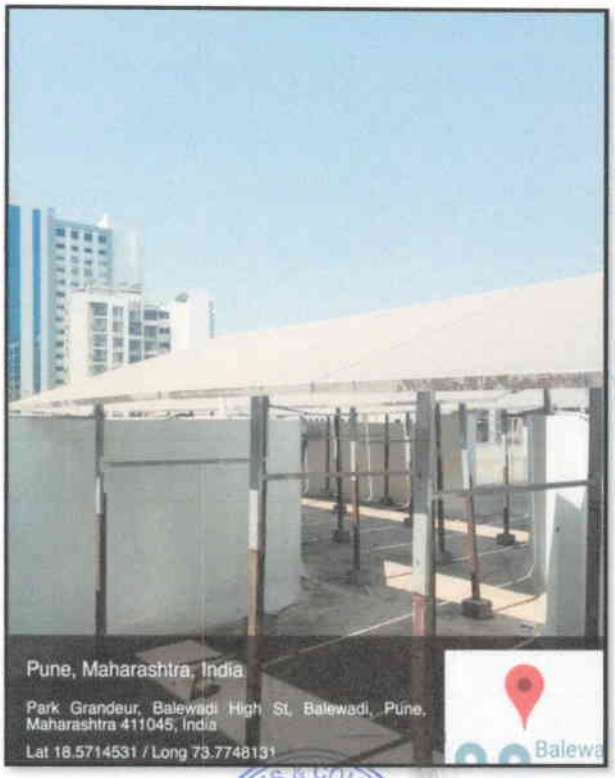
The College has installed Roof Top Solar PV Plant of Capacity **5 kWp**.

In the following Table, we compute the Annual Reduction in CO_2 Emissions due to installation of Roof Top Solar PV Plant.

Table No 2: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	5	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy generation Days	300	Nos
4	Energy Generated in the Year: 22-23	**6000**	kWh
5	1 kWh of Electrical Energy saves	**0.9**	Kg/kWh
6	**Qty of CO_2 Saved by Solar PV Plant =(4)*(5) /1000**	**5.4**	**MT of CO_2**

Photograph of Roof Top Solar PV Plant:



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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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 liveability.

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.

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 3: Indoor Air Quality Parameters:

No	Location	AQI	PM2.5	PM10
1	Classroom	61	37	44
2	Office	60	36	38
3	Reading Room	63	37	45
4	Seminar Hall	60	34	39
5	Library	56	34	39
	Maximum	**63**	**37**	**45**
	Minimum	**56**	**34**	**38**

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal

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 4: Study of Indoor Comfort Condition Parameters:

No	Location	Temperature, ^{0}C	Humidity, %	Lux Level	Noise Level, dB
1	Classroom	28	81	123	44
2	Office	27.9	80	125	43.6
3	Reading Room	27.8	80	120	41.9
4	Seminar Hall	27.9	81	118	42
5	Library	28	81	110	45
	Maximum	**28**	**81**	**125**	**45**
	Minimum	**27.8**	**80**	**110**	**41.9**

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Balewadi, Pune-41[illegible]

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-VI
STUDY OF WASTE MANAGEMENT

6.1 Segregation of Waste at Source:

The waste is segregated at source. Waste collection bins are kept at various locations.

Photograph of Waste Collection Bin:

6.2 Organic Waste:

The College has installed Bio Composting Bed for conversion of Organic Waste.

Photograph of Bio Composting Bed:

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6.3 Sanitary Waste Management:

The College has installed a Sanitary Waste Incinerator to dispose of the Sanitary Waste.

Photograph of Sanitary Waste Incinerator:

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Balewadi, Pune-411045.

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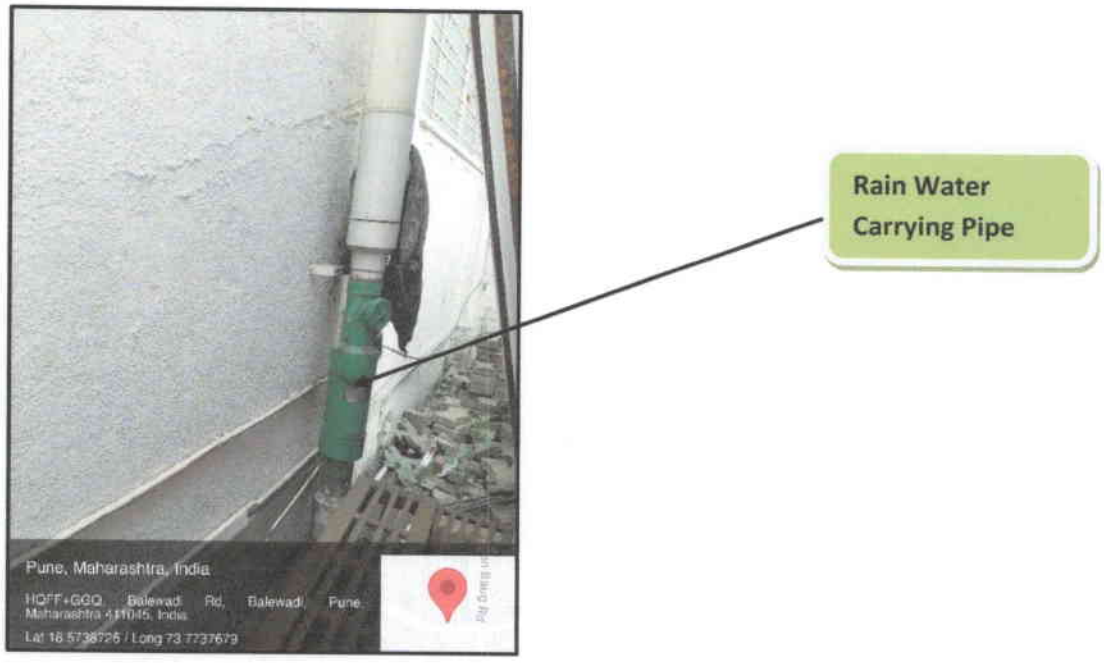
CHAPTER-VII
STUDY OF RAIN WATER MANAGEMENT

The College has installed the Rain Water Harvesting Project. The Rain Water falling on the terrace is used to increase the Underground Water table.

Photograph of Rain Water Collecting Pipe:



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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER VIII
STUDY OF ECO-FRIENDLY PRACTICES

8.1 Plantation in the Campus:

The College has well maintained Tree Plantation inside the campus.

Photograph of Internal Tree Plantation:

8.2 Creation of Awareness on Plastic Free Campus:

In order to create awareness, the College has displayed Posters on Plastic Free Campus

Photograph of Poster on Plastic Free Campus:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ANNEXURE-I:
AIR 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^{0}C
2	Humidity	Less Than 70%

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BALEWADI PUNE - 45

ENGRESS SERVICES

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

Ref: ES/DACC/21-22/03

Date: 11/6/2022

CERTIFICATE

This is to certify that we have conducted Environmental Audit at Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, in the Academic year 2021-22.

The College has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 5 kWp
- Segregation of Waste at source
- Provision of Bio Composting Bed, for conversion of Organic Waste
- Implementation of Rain Water Management Project
- Tree Plantation in the campus
- Creation of Awareness on Water Conservation, by Display of Posters

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

For Engress Services,

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

ENGRESS SERVICES PUNE

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ENVIRONMENTAL AUDIT REPORT

of

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2021-22

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Prepared by

ENGRESS SERVICES

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

ENGRESS SERVICES PUNE

REGISTRATION CERTIFICATES

Regn. No. EA-0192 No. 2942

National Productivity Council
(National Certifying Agency)
PROVISIONAL CERTIFICATE

This is to certify that Mr./Ms. Achyut Yashavant Mehendale
son/daughter of Mr. Yashavant
has passed the National Certification Examination for Energy Auditors in April - 2002, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

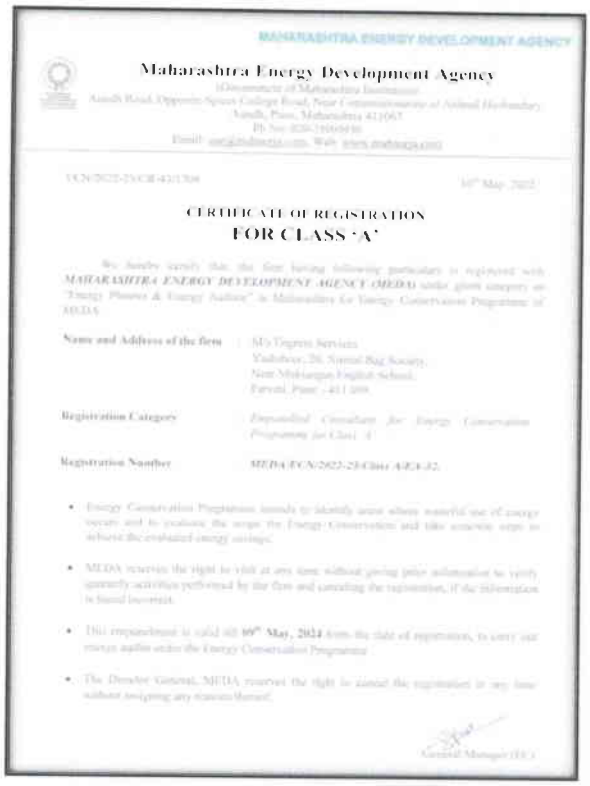
He/She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

He/She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India
Date : 10th August 2002

Controller of Examination



MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Ajanta Road, Opposite Sprint College Road, Near Commissionerate of Animal Husbandry
Aundh, Pune, Maharashtra 411007
Ph No: 020-29800500
Email: ..., Web: ...

MEDA/ECN/2022-23/Cert-AEA/32 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
Vaishnavi, 26, Natraj Raj Society,
Near Mukundnagar English School,
Parvati, Pune - 411 009.

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

Registration Number : MEDA/ECN/2022-23/Cert-AEA/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 cancelling 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 (EE)

BEE AUDITOR CERTIFICATE

MEDA EMPANELMENT CERTIFICATE

GEM Certificate

ASSOCHAM

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 pleasure to award the GEM Certified Professional title to him/her.

Pankaj R. Dharkar
Chairman, GEM

GEM CP 22/788

Deepak Sood
Secretary General, ASSOCHAM

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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ASSOCHAM GEM CP CERTIFICATE

INDEX

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Dnyansagar Arts and Commerce College
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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, for awarding us the assignment of Environmental Audit of their Baner campus for the Academic Year: 2021-22.

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

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment.

2. Pollution caused due to College Activities:

- **Air pollution:** Mainly CO_2 on account of Electricity Consumption
- **Solid Waste:** Bio degradable Kitchen Waste, Garden Waste
- **Liquid Waste:** Human liquid waste

3. Present Level of Energy Consumption & CO_2 Emission:

No	Parameter	Energy consumed, kWh	CO_2 Emissions, MT
1	Total	16689	15.02
2	Maximum	2012	1.81
3	Minimum	989	0.89
4	Average	1390.75	1.25

4. Usage of Renewable Energy & Reduction in CO_2 Emissions:

- Energy Generated by Roof Top Solar PV Plant of Capacity **5 kWp** is **6000 kWh**
- Reduction in CO_2 Emissions in 2021-22 is **5.4 MT**

5. Indoor Air Quality:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	102	68	79
2	Minimum	94	59	70

6. Indoor Comfort Condition Parameters:

No	Parameter/Value	Temperature, ^0C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	23.1	55	126	47
2	Minimum	22.3	51	101	40.2

7. Waste Management:

7.1 Segregation of Waste at Source:

The waste is segregated at source. Separate Dry and Wet waste collection bins are provided at key locations in the campus. It is then further disposed.

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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Balewadi, Pune-41

7.2 Organic Waste Management:

The College has a Bio Composting Bed, for conversion of Organic Waste

8. Rain Water Management:

The College has installed the Rain Water Management Project. The Rain Water falling on the terrace is used to increase the underground Water Table.

8. Eco Friendly Practices:

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

9. Assumptions:

1. 1 kWh of Electrical Energy releases 0.9 Kg of CO_2 into atmosphere
2. Average Energy generated by Solar PV Plant is 4 kWh/kWp/Day
3. Annual Solar Energy Generation Days in 21-22 is 300 Nos

10. References:

- For CO_2 Emissions: www.tatapower.com
- For Solar PV Energy generation: www.solarrooftop.gov.in
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI Standards: www.cpcb.com

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ABBREVIATIONS

Kg	:	Kilo Gram
MSEDCL	:	Maharashtra State Distribution Company Limited
MT	:	Metric Ton
kWh	:	kilo-Watt Hour
LPD	:	Liters per Day
LED	:	Light Emitting Diode
AQI	:	Air Quality Index
CPCB	:	Central Pollution Control Board
PM	:	Particulate Matter

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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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

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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 College)
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 Audit Methodology:

1. Study of present Resource Consumption & CO_2 Emissions
2. Study of CO_2 emission Reduction
3. Study of Indoor Air Quality
4. Study of Indoor Comfort Parameters
5. Study of Waste Management
6. Study of Rain Water Management
7. Study of Environmentally Friendly Initiatives.

1.3 Table No 4: General Details of College:

No	Head	Particulars
1	Name	Dnyansagar Arts & Commerce College
2	Address	SKP Campus, Baner-Balewadi Road, Baner, Pune-411045
3	Year of Establishment	2008

1.4 Google Earth Image:

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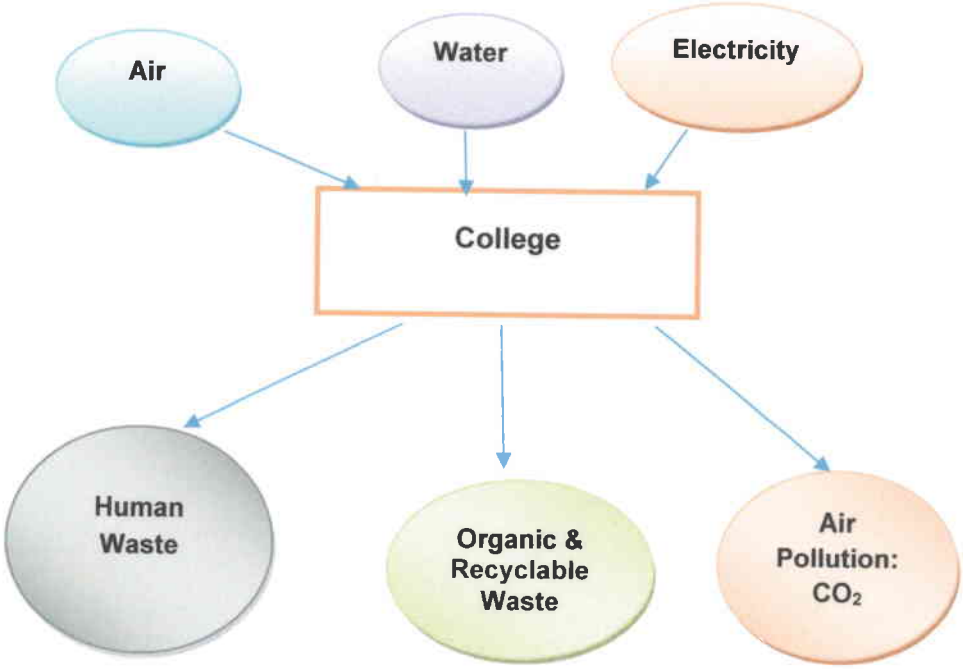
CHAPTER-II
STUDY OF CONSUMPTION OF RESOURCES & CO_2 EMISSION

2.1 The College consumes following Natural/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the College System & Environment as under.

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



2.3 Computation of CO_2 Emissions: A Carbon Foot print is defined as the Total Greenhouse Gas Emissions, emitted due to various activities. The College uses Electrical Energy for various Electrical gadgets& day to day activities.

Basis for computation of CO_2 Emissions:

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

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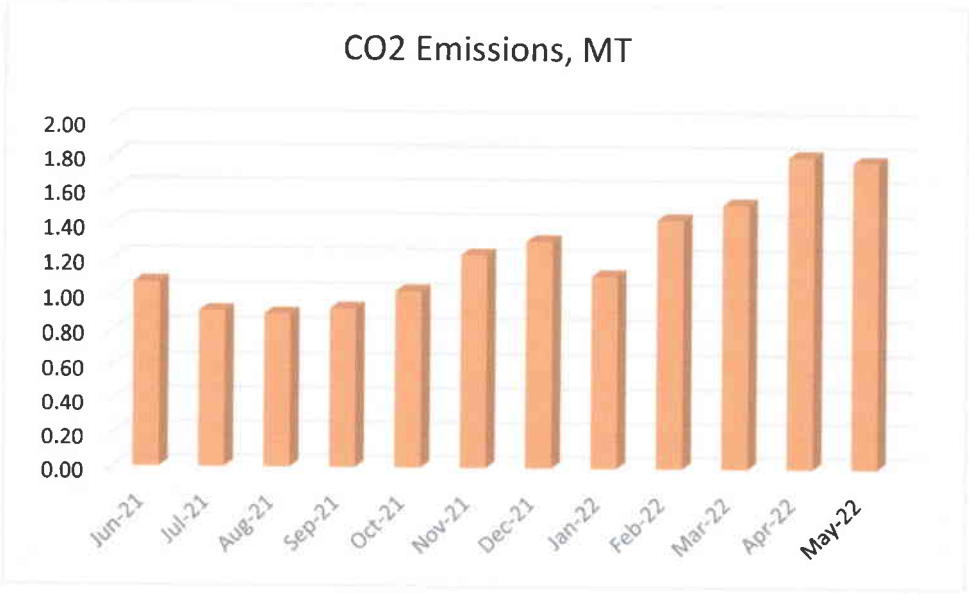
Table No 5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Jun-21	1185	1.07
2	Jul-21	1006	0.91
3	Aug-21	989	0.89

4	Sep-21	1025	0.92
5	Oct-21	1136	1.02
6	Nov-21	1368	1.23
7	Dec-21	1458	1.31
8	Jan-22	1236	1.11
9	Feb-22	1598	1.44
10	Mar-22	1698	1.53
11	Apr-22	2012	1.81
12	May-22	1978	1.78
13	Total	16689	15.02
14	Maximum	2012	1.81
15	Minimum	989	0.89
16	Average	1390.75	1.25

Chart No 2: Representation of Month wise CO_2 emissions:



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CHAPTER-III
STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed Roof Top Solar PV Plant of Capacity 5 kWp.

In the following Table, we compute the Annual Reduction in CO_2 Emissions due to installation of Roof Top Solar PV Plant.

Table No 6: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	5	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy Generation Days	300	Nos
4	Energy Generated in the Year: 21-22	**6000**	kWh
5	1 kWh of Electrical Energy saves	**0.9**	Kg/kWh
6	**Qty of CO_2 Saved by Solar PV Plant =(4)*(5) /1000**	**5.4**	**MT of CO_2**

Photograph of Roof Top Solar PV Plant:

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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 liveability.

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.

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 7: Indoor Air Quality Parameters:

No	Location	AQI	PM-2.5	PM-10
1	Computer Center	102	68	79
2	Faculty Room	94	59	72
3	Director Cabin	97	63	74
4	Classroom	94	61	72
5	Library	97	66	70
	Maximum	**102**	**68**	**79**
	Minimum	**94**	**59**	**70**

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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 8: Study of Indoor Comfort Condition Parameters:

No	Location	Temperature, 0C	Humidity, %	Noise Level, dB	Lux Level
1	Computer Center	22.3	55	101	47
2	Faculty Room	22.5	52	105	42
3	Director Cabin	23	51	104	41
4	Classroom	23.1	53	101	40.2
5	Library	22.8	54	126	42.3
	Maximum	**23.1**	**55**	**126**	**47**
	Minimum	**22.3**	**51**	**101**	**40.2**

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Dnyansagar Arts and Commerce College
Balewadi, Pune-41

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER-VI
STUDY OF WASTE MANAGEMENT

6.1 Segregation of Waste at Source:

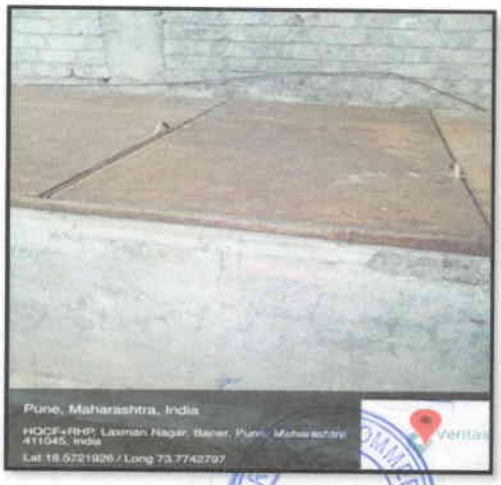
The waste is segregated at source. Separate Dry and Wet waste collection bins are provided at key locations in the campus. It is then further disposed.

Photograph of Waste Collection Bins:

6.2 Organic Waste Management:

The College has arrangement of Bio Composting Bed for disposal of Organic Waste

Photograph of Bio Composting Bed:



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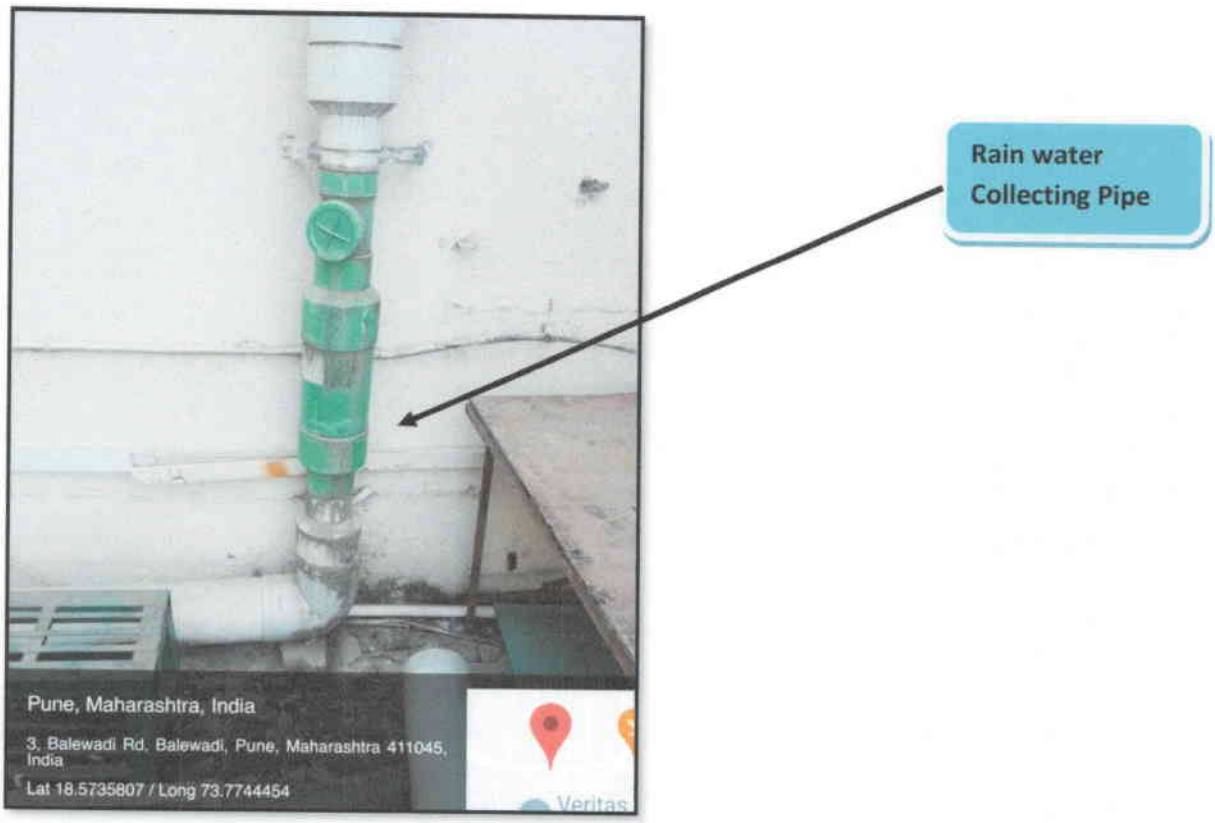
CHAPTER-VII
STUDY OF RAIN WATER MANAGEMENT

The College has installed the Rain Water Management Project. The Rain Water falling on the terrace is used to increase the Underground Water table.

Photograph of Rain Water Collecting Pipe:



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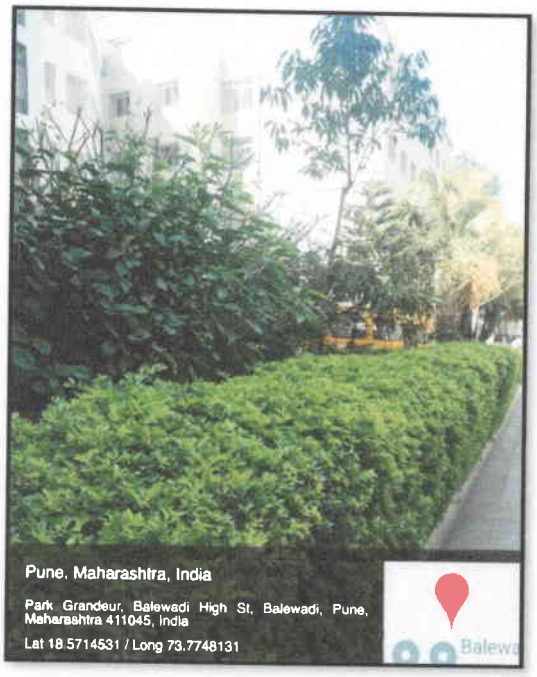
DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

CHAPTER VIII
STUDY OF ENVIRONMENT FRIENDLY PRACTICES

8.1 Plantation in the Campus:

The College has well maintained Tree Plantation inside the campus.

Photograph of Internal Tree Plantation:



8.2 Creation of Awareness on Save Water:

In order to create awareness, the College has displayed Posters on Save Water.

Photograph of Poster on Save Water:

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ANNEXURE-I:
AIR 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
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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
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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^{0}C
2	Humidity	Less Than 70%

Principal
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Balewadi, Pune-41...

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ENRICH CONSULTANTS

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

Ref: EC/DACC/20-21/03

Date: 29/7/2021

CERTIFICATE

This is to certify that we have conducted Environmental Audit at Dnyansagar Arts & Commerce College, SKP Campus, Baner-Balewadi Road, Baner, Pune-411045, in the Academic year 2020-21.

The College has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 5 kWp
- Segregation of Waste at source
- Implementation of Rain Water Management Project
- Tree Plantation in the campus
- Creation of Awareness on Energy Conservation by Display of Posters

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor,
EA-8192

ENRICH CONSULTANTS PUNE

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

ENVIRONMENTAL AUDIT REPORT

Of

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2020-21

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

Prepared by

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com

REGISTRATION CERTIFICATES

Regn. No. EA-8192 No. 2942

National Productivity Council
(National Certifying Agency)

PROVISIONAL CERTIFICATE

This is to certify that Mr. / Ms. *Achyut Yashavant Mehendale*
son / daughter of Mr. *Yashavant*
has passed the National Certification Examination for Energy Auditors in April - 2007, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency

Place : Chennai, India
Date : 10th August 2007

Controller of Examination

BEE ENERGY AUDITOR CERTIFICATE

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: ceo@mahaurja.com, Web: www.mahaurja.com

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 Act, 2001.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

MEDA REGISTRATION CERTIFICATE

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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, for awarding us the assignment of Environmental Audit of their Baner campus for the Academic Year: 2020-21.

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

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

EXECUTIVE SUMMARY

1. Dnyansagar Arts & Commerce College, SKP Campus, Baner - Balewadi Rd, Laxman Nagar, Baner, Pune, 411045, consumes Energy in the form of **Electrical Energy;** used for various equipment

2. Pollution caused due to College Activities:

- **Air pollution:** Mainly CO_2 on account of Electricity Consumption
- **Solid Waste:** Bio degradable Kitchen Waste, Garden Waste
- **Liquid Waste:** Human liquid waste

3. Present Level of Energy Consumption & CO_2 Emission:

No	Parameter	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	11837	10.65
2	Maximum	1478	1.33
3	Minimum	568	0.51
4	Average	986.42	0.89

4. Usage of Renewable Energy & Reduction in CO_2 Emissions:

- Energy Generated by Roof Top Solar PV Plant of Capacity **5 kWp** is **6000 kWh**
- Reduction in CO_2 Emissions in 2020-21 is **16.2 MT**

5. Indoor Air Quality:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	**120**	**69**	**82**
2	Minimum	**105**	**61**	**78**

6. Waste Management:

6.1 Segregation of Waste at Source:

The waste is segregated at source. Separate Dry and Wet waste collection bins are provided at key locations in the campus. It is then further disposed.

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

6.2 Organic Waste Management:

The College has a Bio Composting Bed, for conversion of Organic Waste

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

7. Rain Water Management:

The College has installed the Rain Water Management Project. The Rain Water falling on the terrace is used to increase the underground Water Table.

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

9. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere
2. Average Energy generated by Solar PV Plant is **4 kWh/kWp/Day**
3. Annual Solar Energy Generation Days in 20-21 is **300 Nos**

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- For Solar PV Energy generation: www.solarrooftop.gov.in

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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ABBREVIATIONS

Kg	:	Kilo Gram
MSEDCL	:	Maharashtra State Distribution Company Limited
MT	:	Metric Ton
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CPCB	:	Central Pollution Control Board
PM	:	Particulate Matter

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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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

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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

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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:

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1989	Manufacture, Storage and Import of Hazardous Chemical Rules
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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 College)
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 Audit Methodology:

1. Study of present Resource Consumption & CO_2 Emissions
2. Study of CO_2 emission Reduction
3. Study of Indoor Air Quality
4. Study of Waste Management
5. Study of Rain Water Management
6. Study of Environmental Friendly Initiatives.

1.3 Table No 4: General Details of College:

No	Head	Particulars
1	Name	Dnyansagar Arts & Commerce College
2	Address	SKP Campus, Baner-Balewadi Road, Baner, Pune-411045
3	Year of Establishment	2008

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045

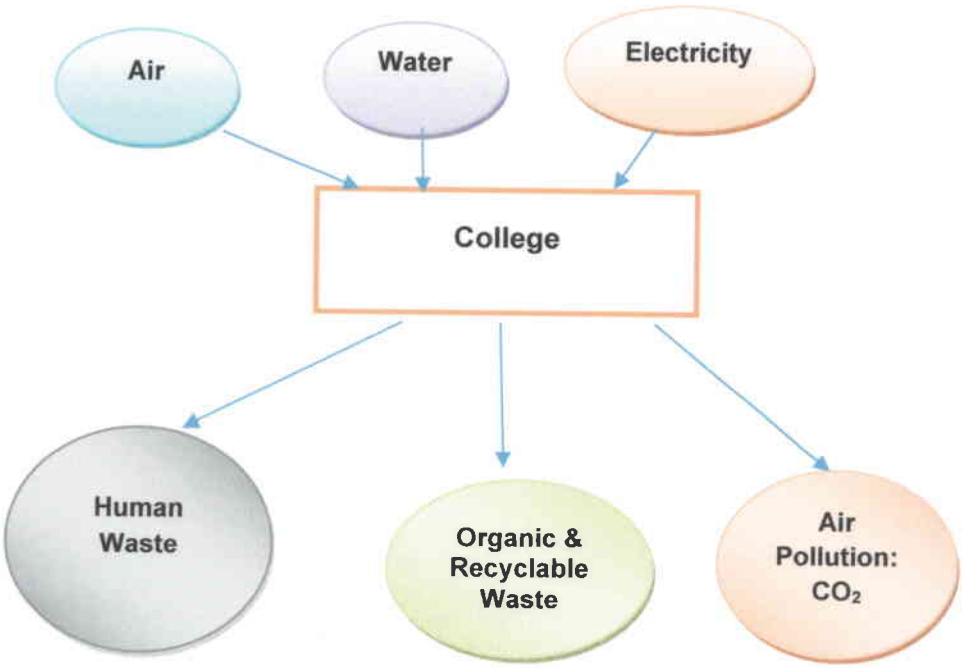
CHAPTER-II
STUDY OF CONSUMPTION OF RESOURCES & CO_2 EMISSION

2.1 The College consumes following Natural/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the College System & Environment as under.

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



2.3 Computation of CO_2 Emissions: A Carbon Foot print is defined as the Total Greenhouse Gas Emissions, emitted due to various activities. The College uses Electrical Energy for various Electrical gadgets& day to day activities.

Basis for computation of CO_2 Emissions:

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

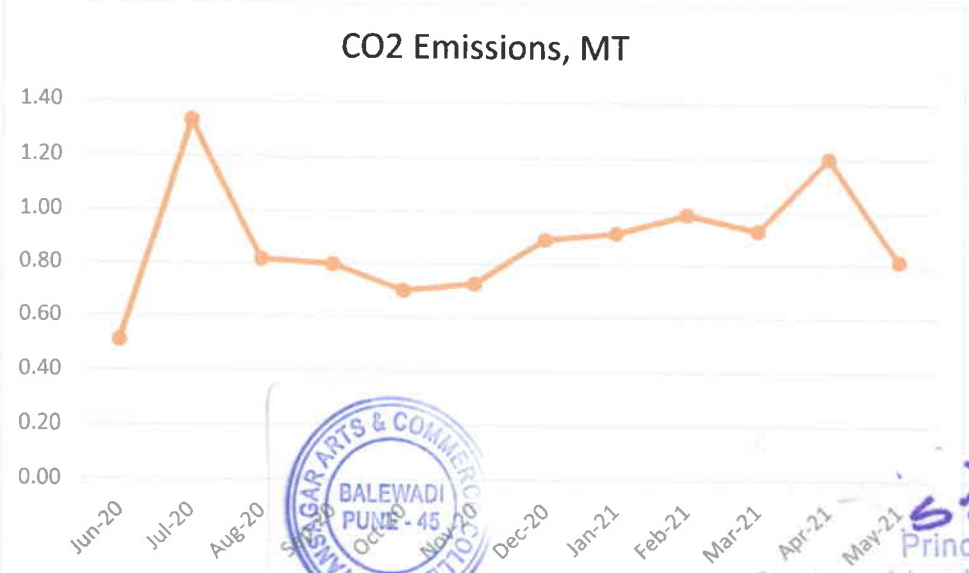
Principal
Arts and Commerce College
Kalewadi, Pune-411...

Table No 5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Jun-20	568	0.51
2	Jul-20	1478	1.33

3	Aug-20	909	0.82
4	Sep-20	889	0.80
5	Oct-20	780	0.70
6	Nov-20	809	0.73
7	Dec-20	997	0.90
8	Jan-21	1025	0.92
9	Feb-21	1103	0.99
10	Mar-21	1036	0.93
11	Apr-21	1336	1.20
12	May-21	907	0.82
13	Total	11837	10.65
14	Maximum	1478	1.33
15	Minimum	568	0.51
16	Average	986.42	0.89

Chart No 2: Representation of Month wise CO_2 emissions:



DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-III
STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed Roof Top Solar PV Plant of Capacity **5 kWp**.

In the following Table, we compute the Annual Reduction in CO_2 Emissions due to installation of Roof Top Solar PV Plant.

Table No 6: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	5	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy Generation Days	300	Nos
4	Energy Generated in the Year: 20-21	**6000**	kWh
5	1 kWh of Electrical Energy saves	**0.9**	Kg/kWh
6	**Qty of CO_2 Saved by Solar PV Plant =(4)*(5) /1000**	**5.4**	**MT of CO_2**

Photograph of Roof Top Solar PV Plant:

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

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 liveability.

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.

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 7: Indoor Air Quality Parameters:

No	Location	AQI	PM2.5	PM10
1	Office	113	61	81
2	Seminar Hall	120	66	81
3	Classroom	110	63	80
4	Director Cabin	105	61	78
5	Computer Center	112	69	82
	Maximum	**120**	**69**	**82**
	Minimum	**105**	**61**	**78**

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE-45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The waste is segregated at source. Separate Dry and Wet waste collection bins are provided at key locations in the campus. It is then further disposed.

Photograph of Waste Collection Bins:

5.2 Organic Waste:

The College has arrangement of Bio Composting Bed for disposal of Organic Waste

Photograph of Bio Composting Bed:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed the Rain Water Management Project. The Rain Water falling on the terrace is used to increase the Underground Water table.

Photograph of Rain Water Collecting Pipe:

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

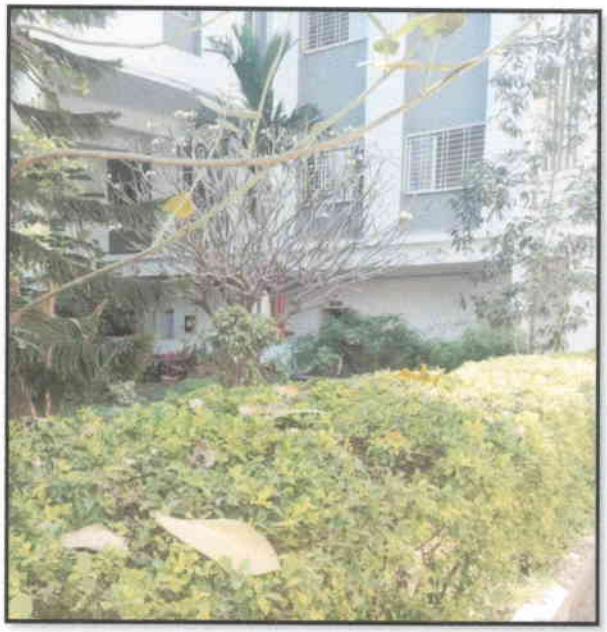
Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045.

CHAPTER VII
STUDY OF ENVIRONMENT FRIENDLY PRACTICES

7.1 Plantation in the Campus:

The College has well maintained Tree Plantation inside the campus.

Photograph of Internal Tree Plantation:



7.2 Creation of Awareness on Energy Conservation:

In order to create awareness, the College has displayed Posters on Energy Conservation.

Photograph of Poster on Energy Conservation:

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-41

ANNEXURE-I:
INDOOR AIR 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 +

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
Balewadi, Pune-411045

ENRICH CONSULTANTS

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

Ref: EC/DACC/19-20/03

Date: 12/8/2020

CERTIFICATE

This is to certify that we have conducted Environmental Audit at Dnyansagar Arts & Commerce College, SKP Campus, Baner-Balewadi Road, Baner, Pune-411045, in the Academic year 2019-20.

The College has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 5 kWp
- Segregation of Waste at source
- Implementation 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 making the campus Eco Friendly.

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor,
EA-8192

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

ENRICH CONSULTANTS PUNE

ENVIRONMENTAL AUDIT REPORT

Of

DNYANSAGAR ARTS & COMMERCE COLLEGE,

SKP Campus, Baner-Balewadi Road, Baner, Pune

Year: 2019-20

DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Prepared by

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society
Near Muktangan English School, Parvati, Pune 411009
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ENRICH CONSULTANTS PUNE

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Controller of Examination

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MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
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2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune-411 006.
Ph No. 020-26614393/26614403
Email: eee@mahaurja.com, Web: www.mahaurja.com

EEN/2018-19/CR-05/4174 19th September, 2018

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(Smita Kudarikar)
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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

Principal
Dnyansagar Arts and Commerce College
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MEDA EMPANELMENT CERTIFICATE

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Dnyansagar Arts and Commerce College
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BALEWADI PUNE - 45
DNYANSAGAR ARTS & COMMERCE COLLEGE

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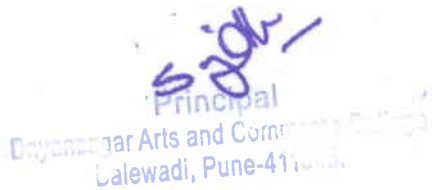

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DNYANSAGAR ARTS & COMMERCE COLLEGE BALEWADI PUNE - 45

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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 College)
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 Audit Methodology:

1. Study of present Resource Consumption & CO_2 Emissions
2. Study of CO_2 emission Reduction
3. Study of Indoor Air Quality
4. Study of Indoor Comfort Parameters
5. Study of Waste Management
6. Study of Rain Water Management
7. Study of Environmental Friendly Initiatives.

1.3 Table No 4: General Details of College:

No	Head	Particulars
1	Name	Dnyansagar Arts & Commerce College
2	Address	SKP Campus, Baner-Balewadi Road, Baner, Pune-411045
3	Year of Establishment	2008

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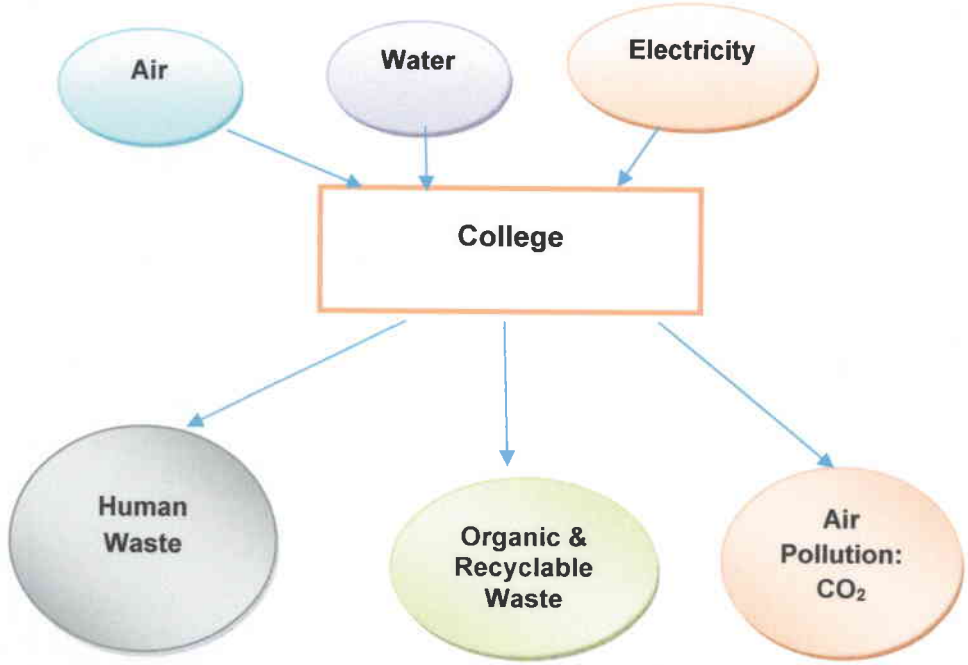
CHAPTER-II
STUDY OF CONSUMPTION OF RESOURCES & CO_2 EMISSION

2.1 The College consumes following Natural/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the College System & Environment as under.

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



2.3 Computation of CO_2 Emissions: A Carbon Foot print is defined as the Total Greenhouse Gas Emissions, emitted due to various activities. The College uses Electrical Energy for various Electrical gadgets& day to day activities.

Basis for computation of CO_2 Emissions:

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

Table No 5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO2 Emissions, MT
1	Jun-19	2018	1.82
2	Jul-19	1980	1.78

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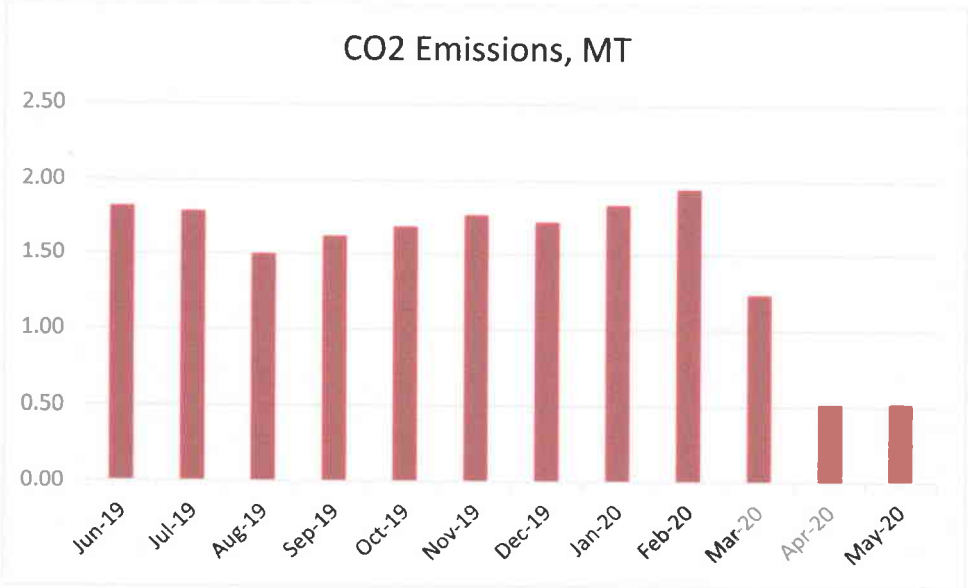
3	Aug-19	1658	1.49
4	Sep-19	1798	1.62
5	Oct-19	1870	1.68
6	Nov-19	1960	1.76
7	Dec-19	1908	1.72
8	Jan-20	2036	1.83
9	Feb-20	2157	1.94
10	Mar-20	1365	1.23
11	Apr-20	568	0.51
12	May-20	568	0.51
13	Total	19886	17.90
14	Maximum	2157	1.94
15	Minimum	568	0.51
16	Average	1657.17	1.49

Chart No 2: Representation of Month wise CO_2 emissions:



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CHAPTER-III
STUDY OF USAGE OF RENEWABLE ENERGY

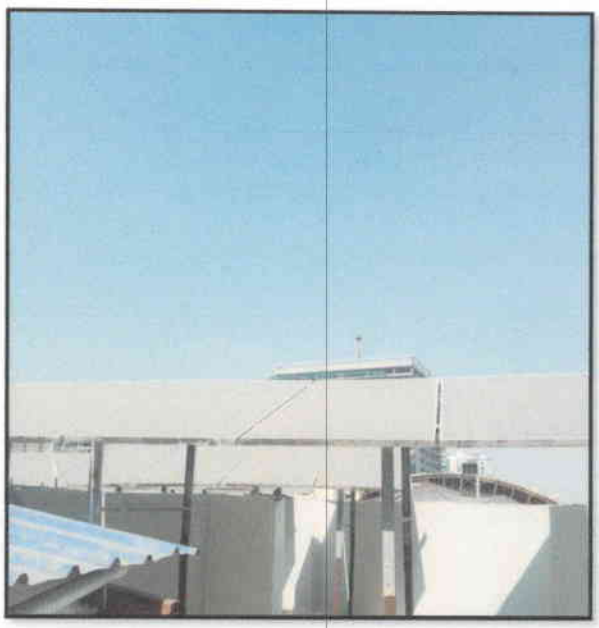
The College has installed Roof Top Solar PV Plant of Capacity **5 kWp**.

In the following Table, we compute the Annual Reduction in CO_2 Emissions due to installation of Roof Top Solar PV Plant.

Table No 6: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	5	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy generation Days	300	Nos
4	Energy Generated in the Year: 19-20	**6000**	kWh
5	1 kWh of Electrical Energy saves	**0.9**	Kg/kWh
6	**Qty of CO_2 Saved by Solar PV Plant =(4)*(5) /1000**	**5.4**	**MT of CO_2**

Photograph of Roof Top Solar PV Plant:



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CHAPTER IV
STUDY OF WASTE MANAGEMENT

4.1 Segregation of Waste at Source:

The waste is segregated at source. Separate Dry and Wet waste collection bins are provided at key locations in the campus. It is then further disposed.

Photograph of Waste Collection Bins:

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CHAPTER-V
STUDY OF RAIN WATER MANAGEMENT

The College has installed the Rain Water Management Project. The Rain Water falling on the terrace is used to increase the Underground Water table.

Photograph of Rain Water Carrying Pipe:

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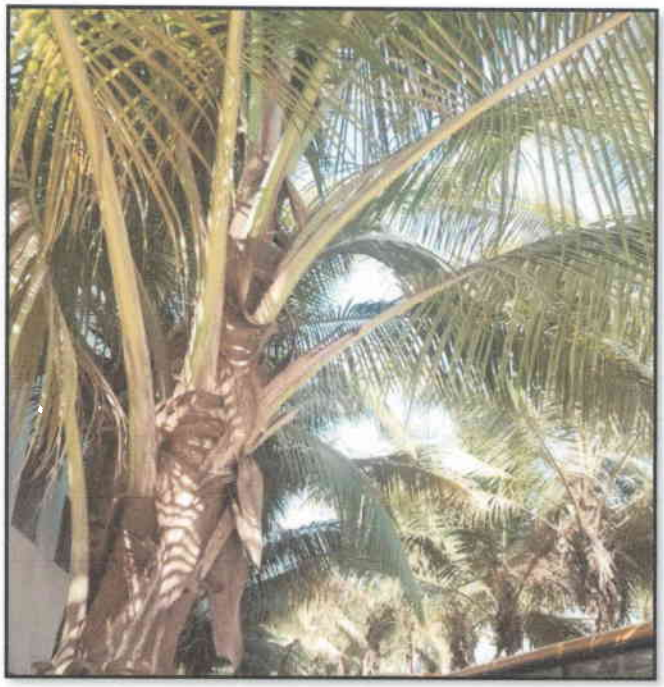
CHAPTER VI
STUDY OF ENVIRONMENT FRIENDLY PRACTICES

6.1 Plantation in the Campus:

The College has well maintained Tree Plantation inside the campus.

Photograph of Internal Tree Plantation:



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