7.1.3.1 GREEN AUDIT

Green audit is official examination of the effects, institute has on the environment. It helps to improve the existing practices with the aim of reducing the adverse effects of these on the environment concerned. It help to improve the facilities in terms of environmental sustainability.

Following are the Green Audit Reports of K J College of Engineering and Management Research, Pune for last five years prepared by external expert of the government recognised organization.

COLLEGE OF ENGINEERING & MANAGEMENT RESEARCH ★ K J
PU/PN/ENGG 378/2009

Principal
KJ College of Engineering & Management Research
Sr No. 25 & 27, Bopdev Ghat,
Kondhawa - Saswad Road, Pune - 411 048

GREEN AUDIT REPORT

of

KJ's Educational Institutes,
K J College of Engineering and Management Research,
Pune 411 048

Year: 2021-22

Prepared by

ENGRESS SERVICES

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

ENGRESS SERVICES PUNE

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/2022-23/CR-43/1709 — 10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

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

Name and Address of the firm : M/s Engress Services
Yashshree, 26, Nirmal Bag Society,
Near Muktangan English School,
Parvati, Pune – 411 009.

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

Registration Number : *MEDA/ECN/2022-23/Class A/EA-32.*

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **09th May, 2024** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

ASSOCHAM

GEM Certificate

ASSOCHAM hereby certifies that

Mr. A Y Mehendale

has successfully passed the
Green and Eco-friendly Movement Certified Professional Test (GEM CP)
with
"Excellent Performance"
on
06 June, 2022

He/she is now eligible to execute the GEM Sustainability Certification Projects.
ASSOCHAM feels proud to award the GEM Certified Professional title to him/her.

Pankaj R. Dharkar
Chairman, GEM

GEM CP 22/788

Deepak Sood
Secretary General, ASSOCHAM

ENGRESS SERVICES PUNE

ENGRESS SERVICES

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

Ref: ES/KJCOEMR/21-22/02 Date: 12/6/2022

CERTIFICATE

This is to certify that we have conducted Green Audit at KJ's Educational Institutes, K J College of Engineering and Management Research, Pune in the year 2021-22.

The College has adopted Energy Efficient& Green Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Installation of 30 kWp Roof Top Solar PV Plant
- Segregation of Waste at source
- Bio Composting Pit for Conversion of Leafy Waste
- Installation of Sewage Treatment Plant of Capacity 450 KLPD
- Installation of Rain Water Harvesting Project
- Internal Tree Plantation
- Good Internal Roads
- Provision of Ramp for Divyangajan
- Creation of Awareness on Resource Conservation by Display of Posters

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

For Engress Services,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENGRESS SERVICES * PUNE *

INDEX

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of KJ's Educational Institutes, K J College of Engineering and Management Research, Pune for awarding us the assignment of Green Audit of their campus for the Year: 2021-22.

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

EXECUTIVE SUMMARY

1. KJ's Educational Institutes, K J College of Engineering and Management Research, Pune consumes Energy in the form of **Electrical Energy** used for various gadgets, Office & other facilities.

2. Present Energy Consumption & CO_2 Emission:

No	Parameter /Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	80675	72.61
2	Maximum	10600	9.54
3	Minimum	5140	4.63
4	Average	6722.94	6.05

3. Various Majors Adopted for Energy Conservation:

- Usage of Energy Efficient LED Fittings
- Usage of Energy efficient STAR Rated Equipment

4. Usage of Renewable Energy & CO_2 Emission Reduction:

- The College has installed Roof Top Solar PV Plant of Capacity **30 kWp.**
- Energy Generated by Solar PV Plant in 21-22 is **36000 kWh**
- Annual Reduction in CO_2 Emissions in 21-22 is **32.4 MT.**

5. Waste Management:

5.1 Segregation of Waste at source:

The waste is segregated at the source and further handed over to agency for further recycling

5.2 Organic Waste Management:

A Bio Composting Pit is used to convert the Leafy Waste into Bio Compost.

5.3 Liquid Waste Water Management:

The College has installed Sewage Treatment Plant of Capacity **450 KLPD**, to treat the Liquid Waste Water. The treated water is used for gardening purpose.

5.4 E Waste Management:

The E Waste is disposed of through Authorized Agency.

6. Rain Water Harvesting:

The College has implemented Rain Water Harvesting project. The Rain Water from the terraces and the Hill slope is channelized properly through channels and pipes and is stored in a specially constructed Water Storage Lake. This Water is used for domestic purpose.

7. Green & Sustainable Practices:

- Well maintained internal road
- Well maintained Internal Tree Plantation.
- Provision of Ramp for Divyangajan
- Creation of Awareness in respect of Resource Conservation by Display of Posters

8. Notes & Assumptions:

1. 1 kWh of Electrical Energy releases **0.9 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**

9. References:

1. For CO_2 Emissions: www.tatapower.com
2. For Solar PV Energy Generation: www.solarrofftop.gov.in

ABBREVIATIONS

LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
MT	:	Metric Ton
KLPD	:	Kilo Liters Per Day

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study present Energy Consumption
2. To Study the present CO_2 emissions
3. To study usage of Renewable Energy
4. To study Waste Management: Solid, Liquid & E-Waste
5. To study Rain Water Harvesting
6. To study Green & Sustainable Practices.

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name	KJ's Educational Institutes, K J College of Engineering and Management Research
2	Address	Sr. No.25 & 27, Pisoli, Near Bopdeo Ghat, Haveli, Dist: Pune 411 048
3	Year of Establishment	2009
4	Affiliation	Savitribai Phule Pune University

1.3 Google Earth Image:

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Electricity Energy.

Table No 2: Electrical Energy Purchased: 2021-22:

No	Month	Energy Purchased, kWh
1	Apr-21	5425
2	May-21	5140
3	Jun-21	5212
4	Jul-21	5696
5	Aug-21	5711
6	Sep-21	6236
7	Oct-21	6494
8	Nov-21	7147
9	Dec-21	7906
10	Jan-22	7615
11	Feb-22	7493
12	Mar-22	10600
13	Total	80675
14	Maximum	10600
15	Minimum	5140
16	Average	6722.94

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

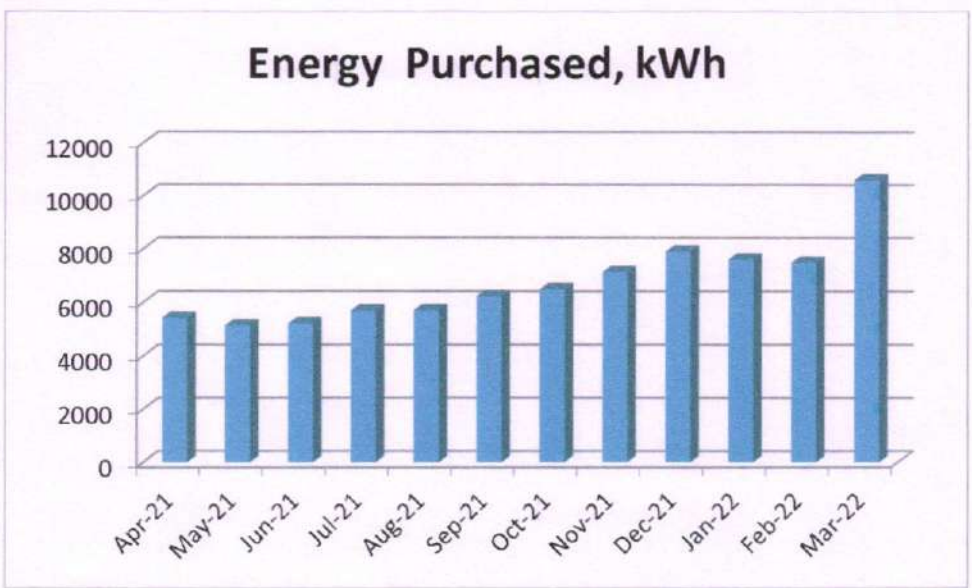


Table No 3: Key Parameters:

No	Parameter	Energy Purchased, kWh
1	Total	80675
2	Maximum	10600
3	Minimum	5140
4	Average	6722.94

CHAPTER-III
STUDY OF CARBON FOOTPRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is: 1 Unit (kWh) of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

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

Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-21	5425	4.88
2	May-21	5140	4.63
3	Jun-21	5212	4.69
4	Jul-21	5696	5.13
5	Aug-21	5711	5.14
6	Sep-21	6236	5.61
7	Oct-21	6494	5.84
8	Nov-21	7147	6.43
9	Dec-21	7906	7.12
10	Jan-22	7615	6.85
11	Feb-22	7493	6.74
12	Mar-22	10600	9.54
13	Total	80675	72.61
14	Maximum	10600	9.54
15	Minimum	5140	4.63
16	Average	6722.94	6.05

Chart No 2: Representation of Month wise CO_2 emissions:

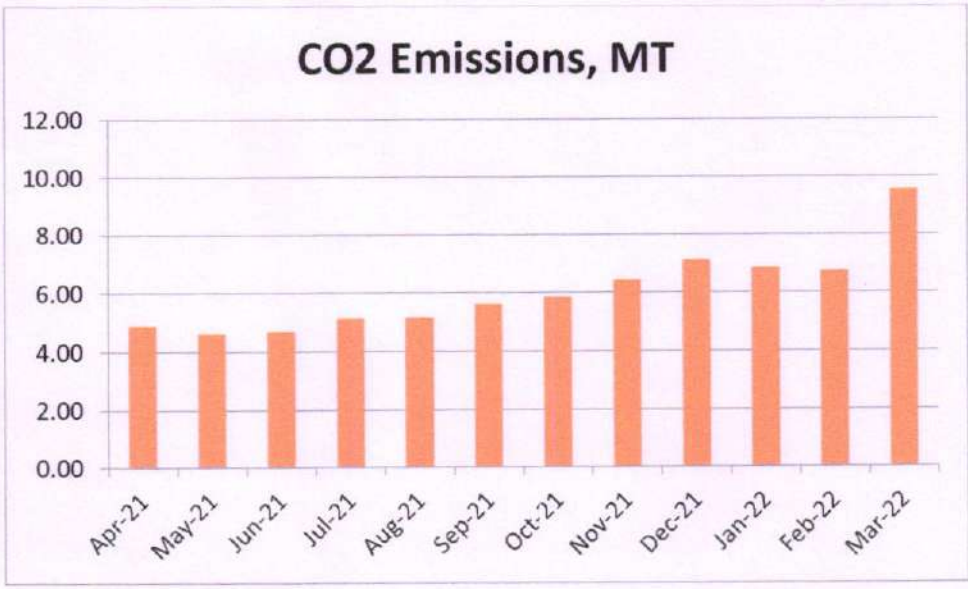


Table No 5: Key Parameters:

No	Value	Energy Purchased, kWh	CO_2 emissions, MT
1	Total	80675	72.61
2	Maximum	10600	9.54
3	Minimum	5140	4.63
4	Average	6722.94	6.05

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed **30 kWp** Roof Top Solar PV Plant. In the following Table, we present the Annual Reduction in CO_2 Emissions due to usage of Renewable Energy.

Table No 6: Calculation of Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	30	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**36000**	kWh
5	1 kWh of Energy is equivalent to	**0.9**	Kg of CO_2
6	Reduction in Annual CO_2 Emissions= **(4) * (5)/1000**	**32.4**	**MT**

Photograph of Roof Top Solar PV Plant:

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source

The College has good housekeeping practices. The Waste is segregated at source and separate Waste Collection Bins are placed for collection of Dry & Wet Waste.

Photograph of Waste Collection Bins:

5.2 Organic Waste Management:

A Bio Composting Pit is used to convert the Leafy Waste into Bio Compost.

Photograph of Bio Composting Pit Arrangement:

5.3 Liquid Waste Water Management:

The College has installed Sewage Treatment Plant of Capacity **450 KLPD**, to treat the Liquid Waste Water. The treated water is used for gardening purpose.

Photograph of Sewage Treatment Plant:

5.4 E Waste Management:

The E Waste is disposed of through Authorized Agency.

CHAPTER-VI
STUDY OF RAIN WATER HARVESTING

The College has implemented Rain Water Management project. The Rain Water from the terraces and Hill slope is channelized properly through channels and pipes and is stored in a specially constructed Water Storage Lake. The Water Storage Capacity is about 1.5 crore Liters. This Water is used for domestic purpose.

Photograph of Rain Water Carrying Channel and Water Storage Lake:

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Internal Road:

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

Photograph of Internal Road:

7.2 Internal Tree Plantation:

The College has beautiful maintained lawn and tree plantation in the campus.

Photograph of Tree Plantation in the campus:

7.3 Provision of Ramp for Divyangajan:

The College has made provision of Ramp for Divyangajan.

Photograph of Ramp:

7.4 Creation of Awareness about Resource Conservation:

The College has displayed Posters on Importance of Energy Conservation.

Photograph of Posters on Resource Conservation:

ANNEXURE
DETAILS OF TREES AND PLANTS IN THE CAMPUS:

No	Common Name of Tree	Qty
1	Teak	2500
2	Rakta Chandan	1000
3	Amla	1000
4	Mango	500
5	Coconut	500
6	Tamarind	1500
7	Ashok	1000
8	Bel	50
9	Bottle Palm	840
10	Supari	180
11	Chikoo	5
12	Gulmohor	70
13	Kanchan	50
14	Mosambi	50
15	Jamun	100
16	Guava	50
17	Phycus	700
18	Arica Palm	500
19	Silver Oak	1000
20	Kaduneem	1000
21	Bamboo	1500
22	Shisum	500
23	Champa	50
24	Rose	50
25	Golden Duranta	2000
26	Jasmine	100
27	Vad	100
28	Peepal	100
29	Bakul	70
30	Australian Babul	70

Total No of Trees in Campus: 17000 Plus

GREEN AUDIT REPORT

of

KJ's Educational Institute,
K J College of Engineering and Management Research,
Pune 411 048

Year: 2020-21

Prepared by

ENRICH CONSULTANTS

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

ENRICH CONSULTANTS * PUNE *

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

An ISO 9001 : 2000 Reg. no. : RQ 91 / 2462

Maharashtra Energy Development Agency

(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eee@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)

ENRICH CONSULTANTS * PUNE *

Enrich Consultants

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

Ref: EC/KJCOEMR/2020-21/02 Date: 12/5/2021

CERTIFICATE

This is to certify that we have conducted Green Audit at KJ's Educational Institute, K J College of Engineering and Management Research, Pune in the year 2020-21.

The College has adopted Energy Efficient & Green Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Installation of 30 kWp Roof Top Solar PV Plant
- Maximum Usage of Day Light
- Segregation of Waste at source
- Installation of Sewage Treatment Plant of Capacity 450 KLPD
- Internal tree Plantation
- Provision of Ramp for Divyangajan
- Creation of Awareness on Resource Conservation by Display of Posters

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS * PUNE *

INDEX

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of KJ's Educational Institute, K J College of Engineering and Management Research, Pune, for awarding us the assignment of Green Audit of their campus for the Year: 2020-21.

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

EXECUTIVE SUMMARY

1. KJ's Educational Institute, K J College of Engineering and Management Research, Pune consumes Energy in the form of **Electrical Energy** used for various gadgets, Office & other facilities.

2. Present Energy Consumption & CO_2 Emission:

No	Value	Energy Purchased, kWh	CO_2 emissions, MT
1	Total	66853	60.17
2	Maximum	6282	5.65
3	Minimum	4565	4.11
4	Average	5571.12	5.01

3. Various Majors Adopted for Energy Conservation:

- Usage of Energy Efficient LED Fittings
- Usage of Energy efficient STAR Rated Equipment

4. Usage of Renewable Energy & CO_2 Emission Reduction:

- The College has installed Roof Top Solar PV Plant of Capacity **30 kWp.**
- Energy Generated by Solar PV Plant in 2020-21 is **36000 kWh**
- Annual Reduction in CO_2 Emissions in 2020-21 is **32.4 MT.**

5. Waste Management:

5.1 Segregation of Waste at source:

The waste is segregated at the source and further handed over to agency for further recycling.

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **450 KLPD**, to treat the Liquid Waste Water. The treated water is used for gardening purpose.

5.3 E Waste Management:

The E Waste is disposed of through Authorized Agency.

6. Rain Water Harvesting:

The College has implemented Rain Water Harvesting project. The Rain Water from the terraces and Hill slope is channelized properly through channels and pipes and is stored in a specially constructed Water Storage Lake. The Water Storage Capacity is about Liters. This Water is used for domestic purpose.

7. Green & Sustainable Practices:

- Well maintained internal road
- Well maintained Internal Tree Plantation.
- Provision of Ramp for Divyangajan
- Creation of Awareness in respect of Resource Conservation by displaying posters

8. Notes & Assumptions:

1. 1 kWh of Electrical Energy releases **0.9 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**

9. References:

1. For CO_2 Emissions: www.tatapower.com
2. For Solar PV Energy Generation: www.solarrofftop.gov.in

ABBREVIATIONS

LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
MT	:	Metric Ton
KLPD	:	Kilo Liters Per Day

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study present Energy Consumption
2. To Study the present CO_2 emissions
3. To study Scope for usage of Renewable Energy
4. To study Waste Management: Solid, Liquid & E-Waste
5. To study Rain Water Harvesting
6. To study Green & Sustainable Practices.

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name	KJ's Educational Institutes, K J College of Engineering and Management Research
2	Address	Sr. No.25 & 27, Pisoli, Near Bopdeo Ghat, Haveli, Dist: Pune 411 048
3	Year of Establishment	2009
4	Affiliation	Savitribai Phule Pune University

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Electricity Energy.

Table No 2: Electrical Energy Purchased: 2020-21:

No	Month	Energy Purchased, kWh
1	Apr-20	4687
2	May-20	5118
3	Jun-20	5443
4	Jul-20	6166
5	Aug-20	6183
6	Sep-20	6236
7	Oct-20	5225
8	Nov-20	4565
9	Dec-20	5059
10	Jan-21	5996
11	Feb-21	6282
12	Mar-21	5893
13	Total	66853
14	Maximum	6282
15	Minimum	4565
16	Average	5571.12

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

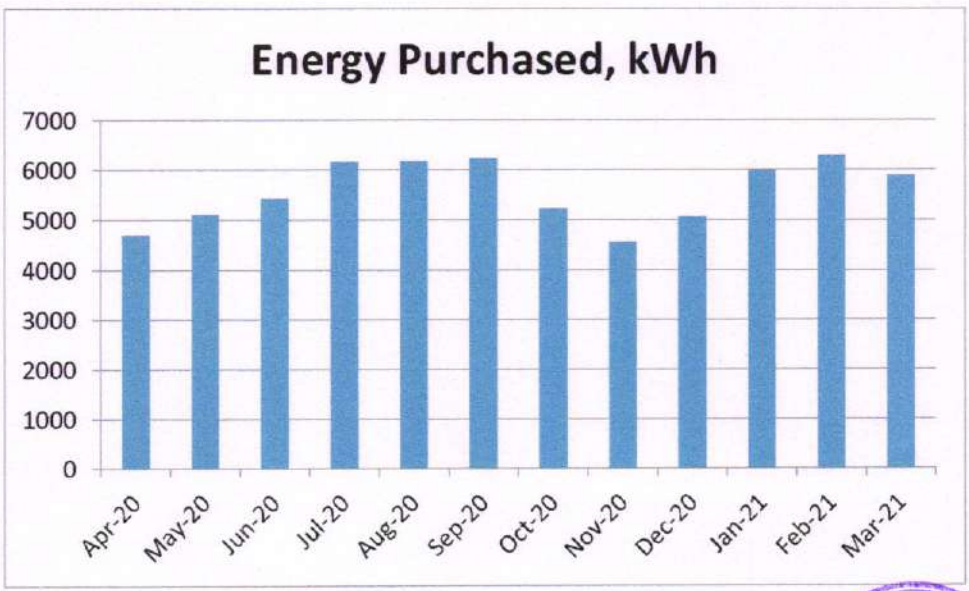


Table No 3: Key Parameters:

No	Parameter	Energy Purchased, kWh
1	Total	66853
2	Maximum	6282
3	Minimum	4565
4	Average	5571.12

CHAPTER-III
STUDY OF CARBON FOOTPRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is: 1 Unit (kWh) of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

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

Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-20	4687	4.22
2	May-20	5118	4.61
3	Jun-20	5443	4.90
4	Jul-20	6166	5.55
5	Aug-20	6183	5.56
6	Sep-20	6236	5.61
7	Oct-20	5225	4.70
8	Nov-20	4565	4.11
9	Dec-20	5059	4.55
10	Jan-21	5996	5.40
11	Feb-21	6282	5.65
12	Mar-21	5893	5.30
13	Total	66853	60.17
14	Maximum	6282	5.65
15	Minimum	4565	4.11
16	Average	5571.12	5.01

Chart No 2: Representation of Month wise CO_2 emissions:

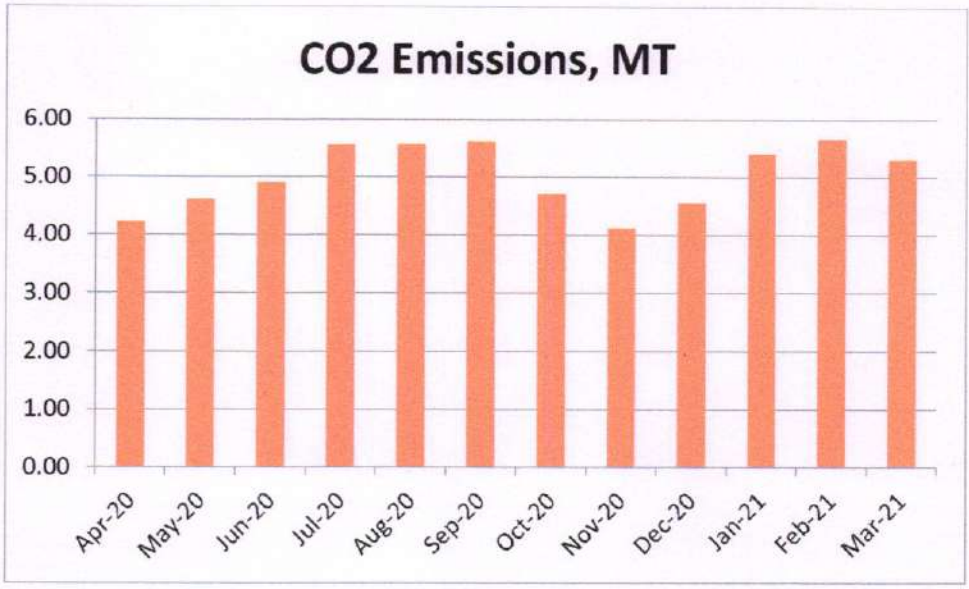


Table No 5: Key Parameters:

No	Value	Energy Purchased, kWh	CO_2 emissions, MT
1	Total	66853	60.17
2	Maximum	6282	5.65
3	Minimum	4565	4.11
4	Average	5571.12	5.01

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed **30 kWp** Roof Top Solar PV Plant. In the following Table, we present the Annual Reduction in CO_2 Emissions due to usage of Renewable Energy.

Table No 6: Calculation of Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	30	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**36000**	kWh
5	1 kWh of Energy is equivalent to	**0.9**	Kg of CO_2
6	Reduction in Annual CO_2 Emissions= **(4) * (5)/1000**	**32.4**	**MT**

Photograph of Solar PV Plant:

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source

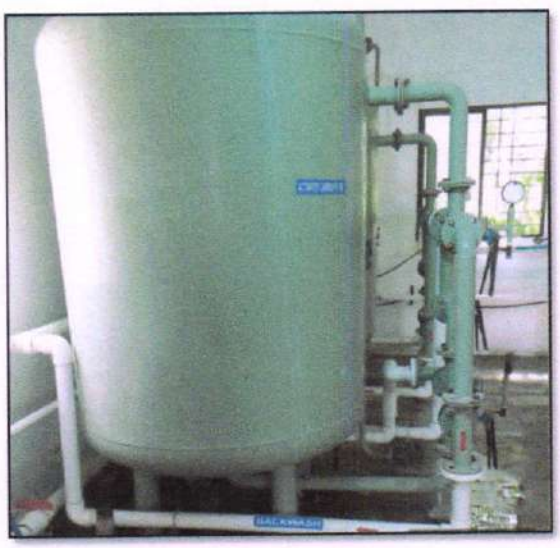
The College has good housekeeping practices. The Waste is segregated at source and separate Waste Collection Bins are placed for collection of Dry & Wet Waste.

Photograph of Waste Collection Bin:

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **450 KLPD**, to treat the Liquid Waste Water. The treated water is used for gardening purpose.

Photograph of Sewage Treatment Plant:



5.3 E Waste Management:

The E Waste is disposed of through Authorized Agency

CHAPTER-VI
STUDY OF RAIN WATER HARVESTING

The College has implemented Rain Water Harvesting project. The Rain Water from the terraces and Hill slope is channelized properly through channels and pipes and is stored in a specially constructed Water Storage Lake. This Water is used for domestic purpose.

Photograph of Rain Water Carrying Channel:

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Internal Road:

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

Photograph of Internal Road:

7.2 Internal Tree Plantation:

The College has beautiful maintained lawn and tree plantation in the campus.

Photograph of Tree Plantation in the campus:

7.3 Provision of Ramp for Divyangajan:

The College has made provision of Ramp for Divyangajan.

Photograph of Ramp:

7.4 Creation of Awareness about Resource Conservation:

The College has displayed Posters on Importance of Energy Conservation.

Photograph of Posters on Resource Conservation:

GREEN AUDIT REPORT

of

KJ's Educational Institute,
K J College of Engineering and Management Research,
Pune 411 048

Year: 2019-20

Prepared by

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

ENRICH CONSULTANTS PUNE

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: 020-26614393/266144403
Email: eec@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 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.

19/9/18
(Smita Kudarikar)
General Manager (EC)

ENRICH CONSULTANTS PUNE

Enrich Consultants

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

Ref: EC/KJCOEMR/2019-20/02 Date: 14/7/2020

CERTIFICATE

This is to certify that we have conducted Green Audit at KJ's Educational Institute, K J College of Engineering and Management Research, Pune in the year 2019-20.

The College has adopted Energy Efficient & Green Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Installation of 30 kWp Roof Top Solar PV Plant
- Segregation of Waste at source
- Installation of Sewage Treatment Plant of Capacity 450 KLPD
- Internal tree Plantation
- Provision of Ramp for Divyangajan
- Creation of Awareness by Display of Posters on Energy Conservation

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

INDEX

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of KJ's Educational Institute, K J College of Engineering and Management Research, Pune, for awarding us the assignment of Green Audit of their campus for the Year: 2019-20.

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

EXECUTIVE SUMMARY

1. KJ's Educational Institute, K J College of Engineering and Management Research, Pune consumes Energy in the form of **Electrical Energy** used for various gadgets, Office & other facilities.

2. Present Energy Consumption & CO_2 Emission:

No	Value	Energy Consumed, kWh	CO_2 emissions, MT
1	Total	118953	95.16
2	Maximum	11263	9.01
3	Minimum	8006	6.41
4	Average	9912.77	7.93

3. Various Majors Adopted for Energy Conservation:

- Usage of Energy Efficient LED Fittings
- Installation of 30 kWp Roof Top Solar PV Plant

4. Usage of Renewable Energy & CO_2 Emission Reduction:

- The College has installed Roof Top Solar PV Plant of Capacity **30 kWp.**
- Energy Generated by Solar PV Plant in 19-20 is **24000 kWh**
- Annual Reduction in CO_2 Emissions is **19.2 MT.**

5. Waste Management:

5.1 Segregation of Waste at source:

The waste is segregated at the source and further handed over to agency for further recycling

5.2 Liquid Waste Management:

The Institute has installed Sewage Treatment Plant of Capacity **450 KLPD**, to treat the Liquid Waste Water. The treated water is used for gardening purpose.

5.3 E Waste Management:

The E Waste is disposed of through Authorized Agency.

6. Rain Water Harvesting:

The Institute has implemented Rain Water Harvesting project. The Rain Water from the terraces and Hill slope is channelized properly through channels and pipes and is stored in a specially constructed Water Storage Lake. This Water is used for domestic purpose.

7. Green & Sustainable Practices:

- Well maintained internal road
- Well maintained Internal Tree Plantation.
- Provision of Ramp for Divyangajan
- Creation of Awareness by Display of Posters on Energy Conservation

8. Notes & Assumptions:

1. 1 kWh of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere
2. **1 kWp** Solar PV system generates **4 kWh** of Electrical Energy per Day
3. Solar PV System installed in **August-2019.**
4. Annual Solar Energy Generation Days: **200 Nos**

9. Reference:

1. For Solar PV: www.solarrofftop.gov.in

ABBREVIATIONS

LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
MT	:	Metric Ton
KLPD	:	Kilo Liters Per Day

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study present Energy Consumption
2. To Study the present CO_2 emissions
3. To study Scope for usage of Renewable Energy
4. To study Waste Management: Solid, Liquid & E-Waste
5. To study Rain Water Harvesting
6. To study Green & Sustainable Practices.

1.2 Table No 1: General Details of Institute:

No	Head	Particulars
1	Name	KJ's Educational Institutes, K J College of Engineering and Management Research
2	Address	Sr. No.25 & 27, Pisoli, Near Bopdeo Ghat, Haveli, Dist: Pune 411 048
3	Year of Establishment	2009
4	Affiliation	Savitribai Phule Pune University

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Electricity Energy.

Table No 2: Electrical Energy Purchased: 2019-20:

No	Month	Energy Consumed, kWh
1	Apr-19	10928
2	May-19	9864
3	Jun-19	8006
4	Jul-19	9544
5	Aug-19	10134
6	Sep-19	11263
7	Oct-19	9928
8	Nov-19	9184
9	Dec-19	9432
10	Jan-20	10441
11	Feb-20	10115
12	Mar-20	10115
13	Total	118953
14	Maximum	11263
15	Minimum	8006
16	Average	9912.77

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

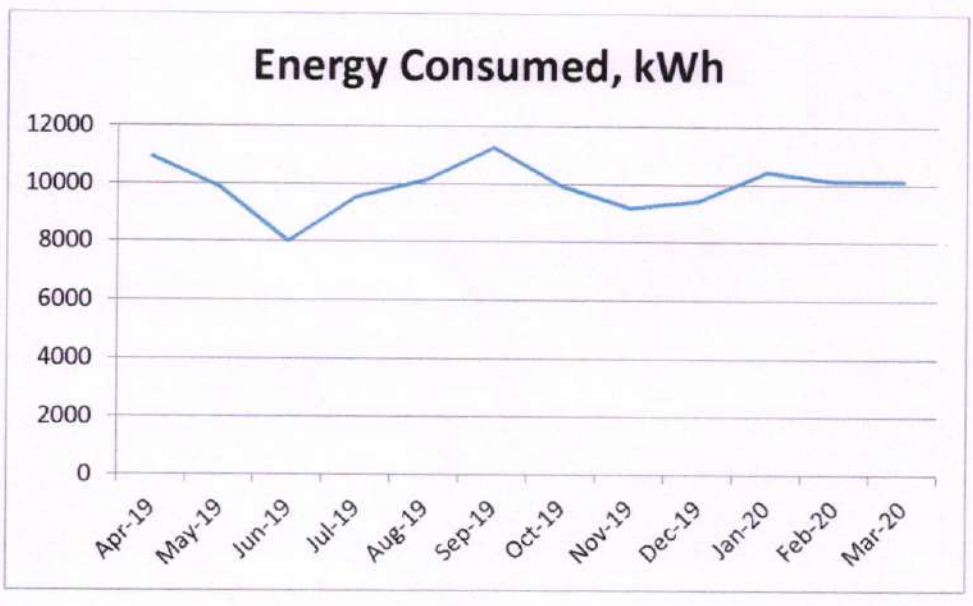


Table No 3: Key Parameters:

No	Parameter	Energy Consumed, kWh
1	Total	118953
2	Maximum	11263
3	Minimum	8006
4	Average	9912.77

CHAPTER-III
STUDY OF CARBON FOOTPRINTING

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

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the Institute for performing its day to day activities

The Institute uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is: 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere

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

Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Apr-19	10928	8.74
2	May-19	9864	7.89
3	Jun-19	8006	6.41
4	Jul-19	9544	7.63
5	Aug-19	10134	8.11
6	Sep-19	11263	9.01
7	Oct-19	9928	7.94
8	Nov-19	9184	7.35
9	Dec-19	9432	7.55
10	Jan-20	10441	8.35
11	Feb-20	10115	8.09
12	Mar-20	10115	8.09
13	Total	118953	95.16
14	Maximum	11263	9.01
15	Minimum	8006	6.41
16	Average	9912.77	7.93

Chart No 2: Representation of Month wise CO_2 emissions:

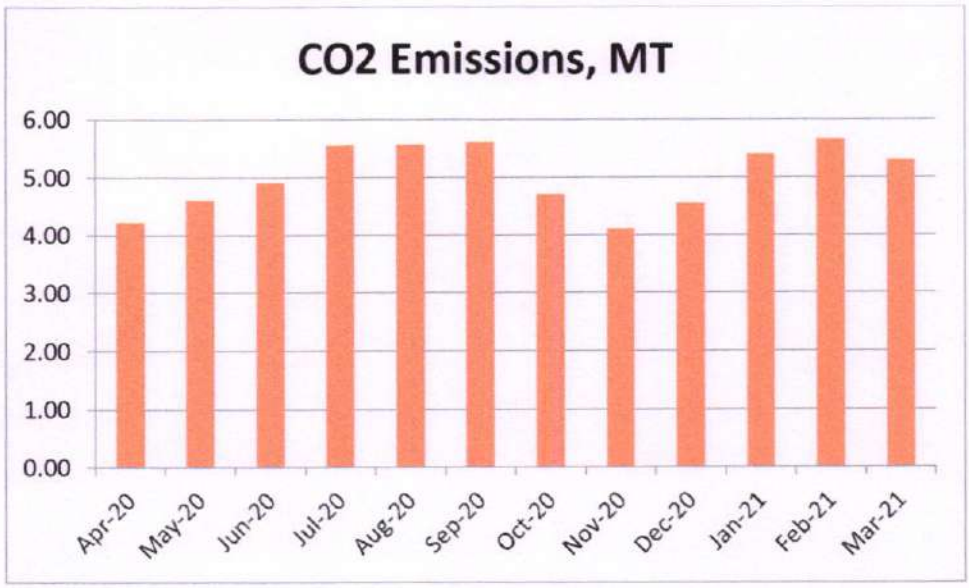


Table No 5: Key Parameters:

No	Value	Energy Consumed, kWh	CO_2 emissions, MT
1	Total	66853	60.17
2	Maximum	6282	5.65
3	Minimum	4565	4.11
4	Average	5571.12	5.01

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed **30 kWp** Roof Top Solar PV Plant. The system was installed in August-2019. Hence, for Calculation purpose we consider the Solar Energy Generation Days in 19-20 to be 200 Nos. In the following Table, we present the Annual Reduction in CO_2 Emissions due to usage of Renewable Energy.

Table No 6: Calculation of Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	30	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	200	Nos
4	Annual Solar Energy Generated	**24000**	kWh
5	1 kWh of Energy is equivalent to	**0.8**	Kg of CO_2
6	Reduction in Annual CO_2 Emissions= **(4) * (5)/1000**	**19.2**	**MT**

Photograph of Solar PV Plant:

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source

The Institute has good housekeeping practices. The Waste is segregated at source and separate Waste Collection Bins are placed for collection of Dry & Wet Waste.

Photograph of Waste Collection Bin:

5.2 Liquid Waste Management:

The Institute has installed Sewage Treatment Plant of Capacity **450 KLPD**, to treat the Liquid Waste Water. The treated water is used for gardening purpose.

Photograph of Sewage Treatment Plant:

5.3 E Waste Management:

The E Waste is disposed of through Authorized Agency.

CHAPTER-VI
STUDY OF RAIN WATER HARVESTING

The Institute has implemented Rain Water Management project. The Rain Water from the terraces and Hill slope is channelized properly through channels and pipes and is stored in a specially constructed Water Storage Lake. This Water is used for domestic purpose.

Photograph of Rain Water Storage Water Storage Lake:

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Internal Road:

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

Photograph of Internal Road:

7.2 Internal Tree Plantation:

The Institute has beautiful maintained lawn and tree plantation in the campus.

Photograph of Tree Plantation in the campus:

7.3 Provision of Ramp for Divyangajan:

The Institute has made provision of Ramp for Divyangajan.

Photograph of Ramp:

7.4 Creation of Awareness about Resource Conservation:

The Institute has displayed Posters on Importance of Energy Conservation.

Photograph of Posters on Resource Conservation:

GREEN AUDIT REPORT

of

KJ's Educational Institute,
K J College of Engineering and Management Research,
Pune 411 048

Year: 2018-19

Prepared by

ENRICH CONSULTANTS

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

ENRICH CONSULTANTS PUNE

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: 020-26614393/266144403
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 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.

19/9/18

(Smita Kudarikar)
General Manager (EC)

ENRICH CONSULTANTS PUNE

Enrich Consultants

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

Ref: EC/KJCOEMR/2018-19/02 Date: 14/5/2019

CERTIFICATE

This is to certify that we have conducted Green Audit at K J's Educational Institute, K J College of Engineering and Management Research, Pune in the year 2018-19.

The College has adopted Energy Efficient & Green Practices:

- Usage of LED Lighting
- Maximum Usage of Day Lighting
- Segregation of Waste at source
- Installation of Sewage Treatment Plant of Capacity 450 KLPD
- Rain Water Harvesting Project
- Good Internal Roads
- Internal tree Plantation

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS * PUNE *

INDEX

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of KJ's Educational Institute, K J College of Engineering and Management Research, Pune, for awarding us the assignment of Green Audit of their campus for the Year: 2018-19.

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

EXECUTIVE SUMMARY

1. KJ's Educational Institute, K J College of Engineering and Management Research, Pune consumes Energy in the form of **Electrical Energy** used for various gadgets, Office & other facilities.

2. Present Energy Consumption & CO_2 Emission:

No	Value	Energy Purchased, kWh	CO_2 emissions, MT
1	Total	117218	93.77
2	Maximum	12121	9.70
3	Minimum	7978	6.38
4	Average	9768.15	7.81

3. Various Majors Adopted for Energy Conservation:

- Usage of LED Lighting
- Maximum Usage of Day Lighting

4. Usage of Renewable Energy & CO_2 Emission Reduction:

- The College has yet to install the Roof Top Solar PV Plant.
- It is recommended to install Roof Top Solar PV Plant.

5. Waste Management:

5.1 Segregation of Waste at source:

The waste is segregated at the source and further handed over to agency for further recycling

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **450 KLPD**, to treat the Liquid Waste Water. The treated water is used for gardening purpose.

6. Rain Water Management:

The College has implemented Rain Water Management project. The Rain Water from the terraces and Hill slope is channelized properly through channels and pipes and is stored in a specially constructed Water Storage Lake. This Water is used for domestic purpose.

7. Green Practices:

- Well maintained internal road
- Well maintained Internal Tree Plantation.

8. Assumption:

1. 1 kWh of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere

ABBREVIATIONS

LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
MT	:	Metric Ton
KLPD	:	Kilo Liters Per Day

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name	KJ's Educational Institute, K J College of Engineering and Management Research
2	Address	Sr. No.25 & 27, Pisoli, Near Bopdeo Ghat, Haveli, Dist: Pune 411 048
3	Year of Establishment	2009
4	Affiliation	Savitribai Phule Pune University

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Electricity Energy.

Table No 2: Electrical Energy Purchased: 2018-19:

No	Month	Energy Purchased, kWh
1	Apr-18	12002
2	May-18	9763
3	Jun-18	7978
4	Jul-18	8860
5	Aug-18	9259
6	Sep-18	10042
7	Oct-18	12121
8	Nov-18	8080
9	Dec-18	8503
10	Jan-19	9765
11	Feb-19	9913
12	Mar-19	10931
13	Total	117218
14	Maximum	12121
15	Minimum	7978
16	Average	9768.15

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

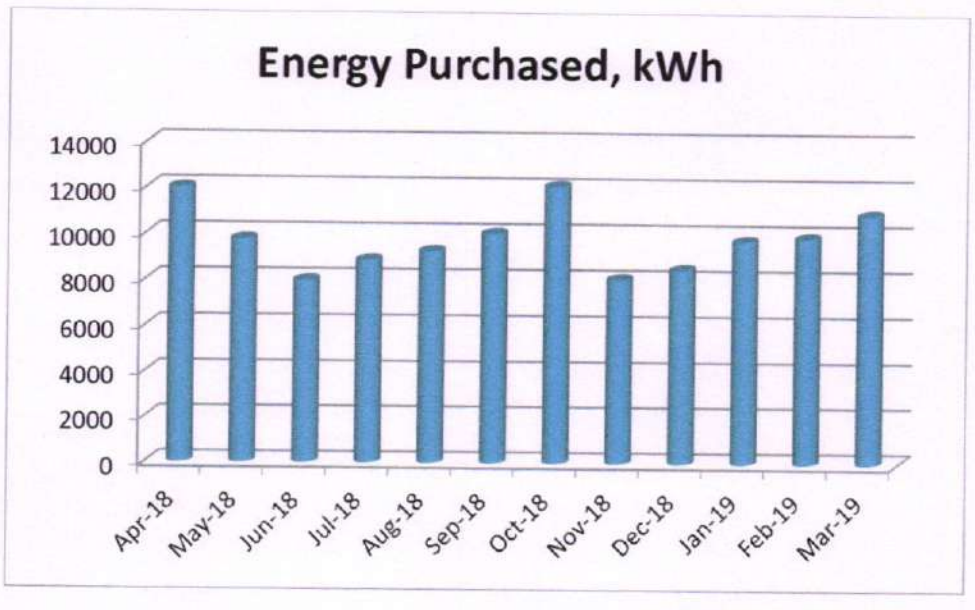


Table No 3: Key Parameters:

No	Parameter	Energy Purchased, kWh
1	Total	117218
2	Maximum	12121
3	Minimum	7978
4	Average	9768.15

CHAPTER-III
STUDY OF CARBON FOOTPRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is: 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere

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

Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-18	12002	9.60
2	May-18	9763	7.81
3	Jun-18	7978	6.38
4	Jul-18	8860	7.09
5	Aug-18	9259	7.41
6	Sep-18	10042	8.03
7	Oct-18	12121	9.70
8	Nov-18	8080	6.46
9	Dec-18	8503	6.80
10	Jan-19	9765	7.81
11	Feb-19	9913	7.93
12	Mar-19	10931	8.75
13	Total	117218	93.77
14	Maximum	12121	9.70
15	Minimum	7978	6.38
16	Average	9768.15	7.81

Chart No 2: Representation of Month wise CO_2 emissions:

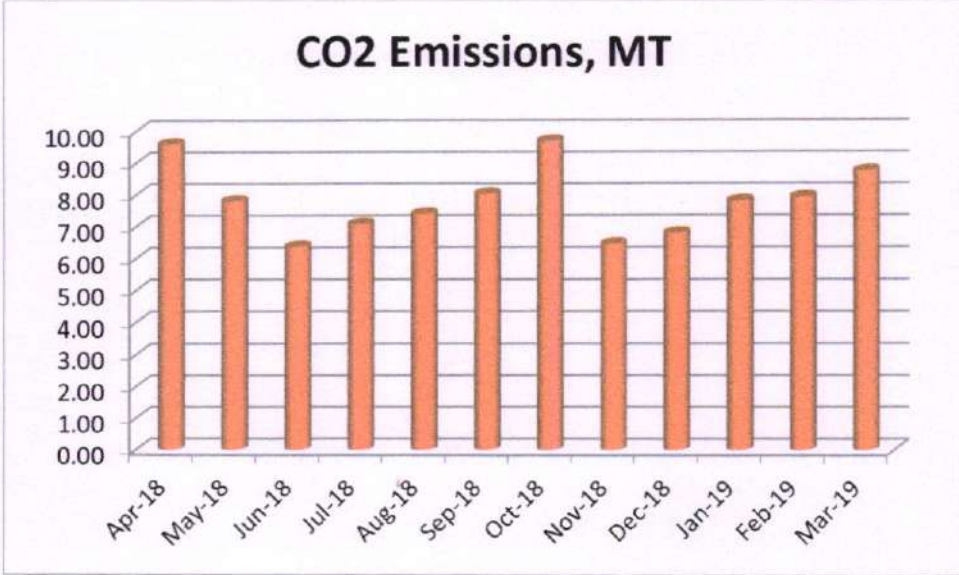


Table No 5: Key Parameters:

No	Value	Energy Purchased, kWh	CO_2 emissions, MT
1	Total	117218	93.77
2	Maximum	12121	9.70
3	Minimum	7978	6.38
4	Average	9768.15	7.81

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

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

It is recommended to install Roof Top Solar PV Plant.

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source

The Waste is segregated at source and separate Waste Collection Bins are placed for collection of Dry & Wet Waste.

Photograph of Waste Collection Bin:

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **450 KLPD**, to treat the Liquid Waste Water. The treated water is used for gardening purpose.

Photograph of Sewage Treatment Plant:

CHAPTER-VI
STUDY OF RAIN WATER HARVESTING

The College has implemented Rain Water Harvesting project. The Rain Water from the terraces and Hill slope is channelized properly through channels and pipes and is stored in a specially constructed Water Storage Lake. This Water is used for domestic purpose.

Photograph of Rain Water Carrying Channel and Water Storage Lake:

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Internal Road:

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

Photograph of Internal Road:

7.2 Internal Tree Plantation:

The College has beautiful maintained lawn and tree plantation in the campus.

Photograph of Tree Plantation in the campus:

GREEN AUDIT REPORT

of

KJ's Educational Institute,
K J College of Engineering and Management Research,
Pune 4110 48

Year: 2017-18

Prepared by

ENRICH CONSULTANTS

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

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: 020-26614393/266144403, Fax No: 020-26615031
Email: econ@mahaurja.com , Web: www.mahaurja.com

ECN/2017-18/CR-01/5726 30th November 2017

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 under Save Energy Programme of MEDA.

Name and Address of the firm	:	Enrich Consultants Yashashree, Plot No. 26,Nirmal Baug Society,Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Save Energy Programme.*
Registration Number	:	***MEDA/ECN/CR-01/2017-18/EA-37***

- The Save Energy 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 upto **3 year** from the date of registration, to carry out energy audits under the Save Energy Programme of MEDA.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

(Smita Kudarikar)
Manager (EC)

ENRICH CONSULTANTS PUNE

Enrich Consultants

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

Ref: EC/KJCOEMR/2017-18/02 Date: 14/5/2018

CERTIFICATE

This is to certify that we have conducted Green Audit at KJ's Educational Institute, K J College of Engineering and Management Research, Pune in the year 2017-18.

The College has adopted Energy Efficient & Green Practices:

- Maximum Usage of Day Light
- Segregation of Waste at source
- Installation of Sewage Treatment Plant of Capacity 450 KLPD
- Rain Water Harvesting Project
- Good Internal Roads
- Internal Tree Plantation

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS PUNE

INDEX

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of KJ's Educational Institute, K J College of Engineering and Management Research, Pune, for awarding us the assignment of Green Audit of their campus for the Year: 2017-18.

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

EXECUTIVE SUMMARY

1. KJ's Educational Institute, K J College of Engineering and Management Research, Pune consumes Energy in the form of **Electrical Energy** used for various gadgets, Office & other facilities.

2. Present Energy Consumption & CO_2 Emission:

No	Value	Energy Purchased, kWh	CO_2 emissions, MT
1	Total	116983	93.59
2	Maximum	12097	9.68
3	Minimum	7962	6.37
4	Average	9749	7.80

3. Usage of Renewable Energy & CO_2 Emission Reduction:

- The College has yet to install the Roof Top Solar PV Plant.
- It is recommended to install Roof Top Solar PV Plant.

4. Waste Management:

4.1 Segregation of Waste at source:

The waste is segregated at the source and further handed over to agency for further recycling

4.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **450 KLPD**, to treat the Liquid Waste Water. The treated water is used for gardening purpose.

5. Rain Water Harvesting: The College has implemented Rain Water Harvesting Project. The Rain Water from the terraces and Hill slope is channelized properly through channels and pipes and is stored in a specially constructed Water Storage Lake. This Water is used for domestic purpose.

6. Green Practices:

- Well maintained internal road
- Well maintained Internal Tree Plantation.

7. Assumption:

1. **1 kWh** of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere

ABBREVIATIONS

LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
MT	:	Metric Ton
KLPD	:	Kilo Liters Per Day

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name	KJ's Educational Institute, K J College of Engineering and Management Research
2	Address	Sr. No.25 & 27, Pisoli, Near Bopdeo Ghat, Haveli, Dist: Pune 411 048
3	Year of Establishment	2009
4	Affiliation	Savitribai Phule Pune University

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Electricity Energy.

Table No 2: Electrical Energy Purchased: 2017-18:

No	Month	Energy Purchased, kWh
1	Apr-17	11978
2	May-17	9744
3	Jun-17	7962
4	Jul-17	8842
5	Aug-17	9241
6	Sep-17	10022
7	Oct-17	12097
8	Nov-17	8064
9	Dec-17	8486
10	Jan-18	9745
11	Feb-18	9893
12	Mar-18	10910
13	Total	116983
14	Maximum	12097
15	Minimum	7962
16	Average	9749

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

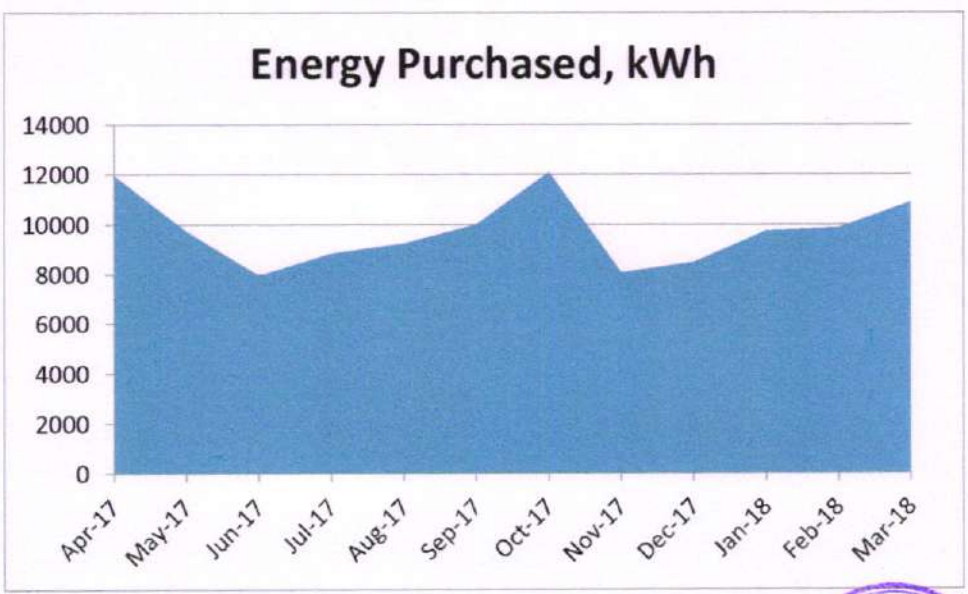


Table No 3: Key Parameters:

No	Parameter	Energy Purchased, kWh
1	Total	116983
2	Maximum	12097
3	Minimum	7962
4	Average	9749

CHAPTER-III
STUDY OF CARBON FOOTPRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is: 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere

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

Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-17	11978	9.58
2	May-17	9744	7.79
3	Jun-17	7962	6.37
4	Jul-17	8842	7.07
5	Aug-17	9241	7.39
6	Sep-17	10022	8.02
7	Oct-17	12097	9.68
8	Nov-17	8064	6.45
9	Dec-17	8486	6.79
10	Jan-18	9745	7.80
11	Feb-18	9893	7.91
12	Mar-18	10910	8.73
13	Total	116983	93.59
14	Maximum	12097	9.68
15	Minimum	7962	6.37
16	Average	9749	7.80

Chart No 2: Representation of Month wise CO_2 emissions:

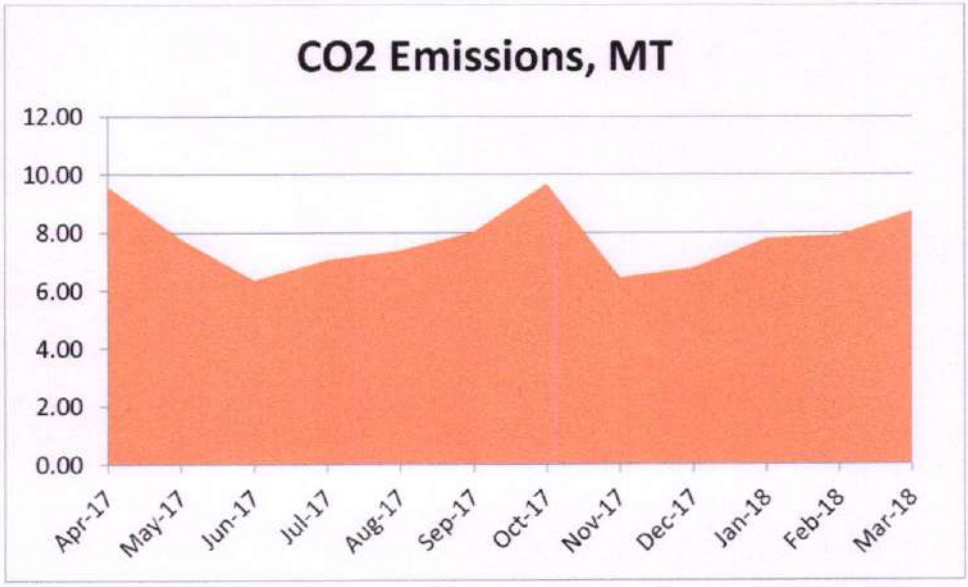


Table No 5: Key Parameters:

No	Value	Energy Purchased, kWh	CO_2 emissions, MT
1	Total	116983	93.59
2	Maximum	12097	9.68
3	Minimum	7962	6.37
4	Average	9749	7.80

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

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

It is recommended to install Roof Top Solar PV Plant.

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source

The Waste is segregated at source and separate Waste Collection Bins are placed at various locations, for collection of Dry & Wet Waste.

Photograph of Waste Collection Bin:

5.2 Liquid Waste Management:

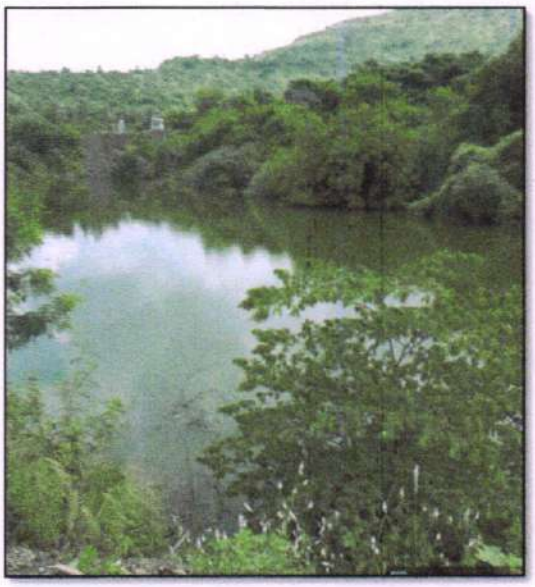
The College has installed Sewage Treatment Plant of Capacity **450 KLPD**, to treat the Liquid Waste Water. The treated water is used for gardening purpose.

Photograph of Sewage Treatment Plant:

CHAPTER-VI
STUDY OF RAIN WATER HARVESTING

The College has implemented Rain Water Harvesting project. The Rain Water from the terraces and Hill slope is channelized properly through channels and pipes and is stored in a specially constructed Water Storage Lake. This Water is used for domestic purpose.

Photograph of Rain Water Storage Lake:



CHAPTER-VII
STUDY OF GREEN PRACTICES

7.1 Pedestrian Friendly Internal Road:

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

Photograph of Internal Road:

7.2 Internal Tree Plantation:

The College has beautiful maintained lawn and tree plantation in the campus.

Photograph of Tree Plantation in the campus: