Shree Santkrupa College of Pharmacy, Ghogaon

Criterion 7

Institutional Values and Best Practices

7.1

Institutional Values and Social Responsibilities

7.1.3

Quality audits on environment and energy regularly undertaken by the Institution. The institutional environment and energy initiatives are confirmed through the following

1. **Green audit / Environment audit**
2. **Energy audit**
3. **Clean and green campus initiatives**
4. **Beyond the campus environmental promotion activities**

7.1 Institutional Values and Social Responsibilities

7.1.3 Quality audits on environment and energy regularly undertaken by the Institution. The institutional environment and energy initiatives are confirmed through the following

1. **Green audit / Environment audit**
2. **Energy audit**
3. **Clean and green campus initiatives**
4. **Beyond the campus environmental promotion activities**

C. Green audit/environmental audit report from recognized bodies

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Green Audit Reports

Green/Environmental Audit Report

2022-23

GREEN AUDIT REPORT

of

Shree Santkrupa Shikshan Sanstha's

SHREE SANTKRUPA COLLEGE OF PHARMACY,

Ghogaon (Shivajinagar) Dist. Satara (M.H.) – 415 111

Year: 2022-23

Prepared by:

ENGRESS SERVICES

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

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society, Near Muktangan English School,
Parvati, Pune 411 009Tel: 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/SCP/22-23/02 **Date: 07/11/2023**

This is to certify that we have conducted Green Audit at Shree Santkrupa College of Pharmacy, Ghogaon, in the Year 2022-23.

The Institute has adopted following Energy Efficient & Green Practices:

- Usage of Energy Efficient LED Light Fitting
- Installation of 25 Kw Capacity Solar Power Plant
- Segregation of Waste at Source
- Installation of Bio Composting Pit
- College has installed septic tanks and it cleans periodically
- Installation of Rain Water Harvesting Project
- Maintenance of good Internal Road
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of awareness by display of Posters on Resource Conservation

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

REGISTRATION CERTIFICATES


Maharashtra Energy Development Agency

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

MEDA Registration Certificate


GEM Certificate

ASSOCHAM

ASSOCHAM hereby certifies that

Mr. A Y Mehendale

"Excellent Performance"

GEM Certified Professional Certificate


Certificate of Registration

ENGRESS SERVICES

ISO 9001:2015

IAF

Director

ISO: 9001-2015 Certificate


Certificate of Registration

ENGRESS SERVICES

ISO 14001:2015

IAF

Director

ISO: 14001-2015 Certificate

INDEX

ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Shree Santkrupa College of Pharmacy, Ghogaon for awarding us the assignment of Green Audit of their Campus for the Year: 2022-23.

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

EXECUTIVE SUMMARY

1. **Shree Santkrupa College of Pharmacy, Ghogaon** consumes Energy in the form of **Electrical Energy;** used for various Electrical Equipment, office & other facilities.

2. Present Energy Consumption& CO_2 Emission:

No	Particulars	Value	Unit
1	Annual Energy Consumption	**18593**	kWh
2	Annual CO_2 Emissions	**17.13**	MT

3. Renewable Energy & Energy Efficiency Projects:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting
- Installation of 25 Kw Capacity Solar Power Plant

4. Waste Management:

5.1 Segregation of Waste at Source:

The Waste is segregated at source in separate Waste Bins & is handed over for further action.

5.2 Bio Composting Pit:

The Institute has a Bio Composting Pit, to convert the Leafy Waste into Bio Compost.

5.3 Liquid Waste Management:

The Institute has installed Septic Tank and it cleans periodically.

5.4Sanitary Waste Management:

The Institute has not installed Sanitary Waste Incinerator, It is recommended to install Sanitary Waste Incinerator for disposal of the Sanitary Waste.

5.5 E-Waste Management:

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

6. Rain Water Management:

The Institute has installed the Rainwater Management project; the rain water falling on the terrace is collected through pipes and is used for recharging the land water table.

7. Green & Sustainable Practices:

- Maintenance of good Internal Road
- Provision of Ramp for Divyangajan
- Creation of awareness on Resource Conservation Display of Posters

8. Assumption:

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

9. Reference:

- For CO_2 Emissions: www.tatapower.com

ABBREVIATIONS

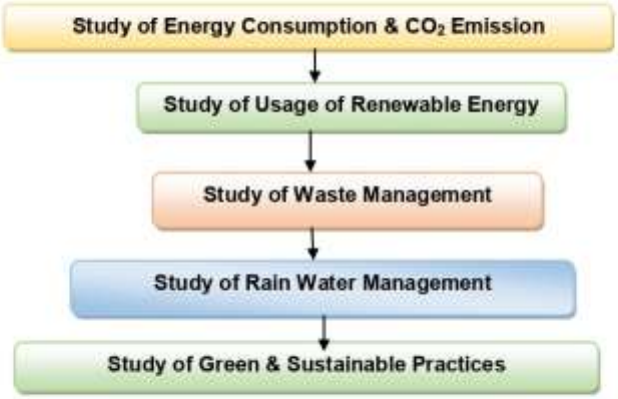
BEE	Bureau of Energy Efficiency
kWh	Kilo Watt Hour
LPD	Liters Per Day
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
Qty	Quantity

CHAPTER-I
INTRODUCTION

1.1 Introduction:

A Green Audit is conducted at Shree Santkrupa College of Pharmacy, Ghogaon.

1.2 Audit Procedural Steps:



1.3 Institute Location Image:

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. 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 as under

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

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

Table No1: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO_2 Emissions, MT
1	Apr-22	1143	1.06
2	May-22	1356	1.25
3	Jun-22	1440	1.33
4	Jul-22	1560	1.44
5	Aug-22	1725	1.58
6	Sep-22	1668	1.54
7	Oct-22	1710	1.58
8	Nov-22	1653	1.52
9	Dec-22	1473	1.36
10	Jan-23	1650	1.52
11	Feb-23	1563	1.44
12	Mar-23	1652	1.52
13	Total	18593	17.13
14	Maximum	1725	1.58
15	Minimum	1143	1.06
16	Average	1549.41	1.43

Chart No 1: Month wise CO_2 Emissions:

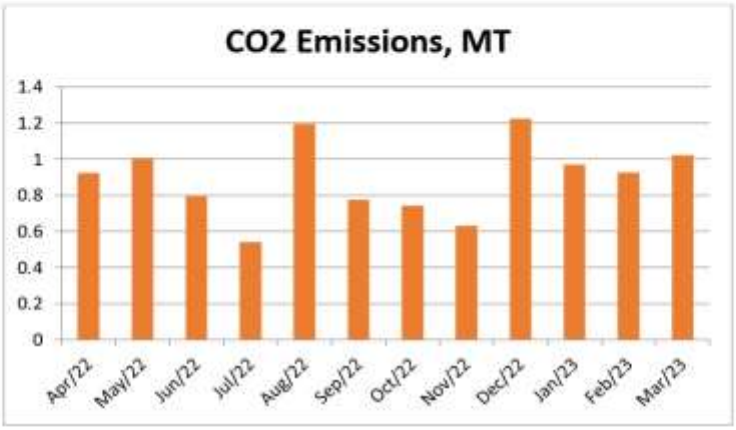


Table No2: Important Parameters:

No	Parameter/ Value	Energy Consumed, kWh	CO_2 Emissions, MT
1	Total	18593	17.13
2	Maximum	1725	1.58
3	Minimum	1143	1.06
4	Average	1549.41	1.43

CHAPTER III
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed a **25 kWp** capacity Roof top Solar PV Plant this year.
Now we compute the Percentage of Alternate Energy to Annual Energy demand:

Table No 7: Computation of % Annual Energy Demand met by Alternate Energy:

No	Particulars	Value	Unit
1	Energy Purchased from MSEDCL	18593	kWh
2	Installed Roof Top Solar PV Plant Capacity	25	kWp
3	Average Daily Energy Generated	4	kWh/kWp
4	Annual Generation Days	300	Nos
5	Annual Solar Energy Generated	30000	kWh
6	Total Energy Demand = (1) + (5)	35887	kWh
7	Expecting % of Usage of Alternate Energy to Total Annual Energy Demand for Current Year Consumption= (5)*100/ (6)	61	%

Photograph of Roof Top Solar PV Plant:

CHAPTER IV
STUDY OF WASTE MANAGEMENT

4.1 Segregation of Waste at Source:

The Waste is segregated at source in separate Waste Bins & is handed over for further action.

Photograph of Waste Collection Bins:

4.2 Bio Composting Pit:

The Institute has a Bio Composting Pit, to convert the Leafy Waste into Bio Compost.

Photograph of Bio Composting Pit:

4.3Liquid Waste Management:
The Institute has installed Septic Tanks it cleans periodically.

4.4 Sanitary Waste Management:
The Institute has not install Sanitary Waste Incinerator, It is recommended to install Sanitary Waste Incinerator for disposal of the Sanitary Waste.

4.5 E Waste Management:

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

CHAPTER V
STUDY OF RAIN WATER MANAGEMENT

The Institute has implemented the Rain Water Management Project. The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used for recharging the land water table and gardening purpose.

Photograph of Rain Water Management & Pipe Section:

CHAPTER VI
STUDY OF GREEN & SUSTAINABLE PRACTICES

6.1 Internal Pedestrian:

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

Photograph of Internal Pedestrian:

6.2 Internal Tree Plantation:

The College has well maintained landscaped garden in the campus.

Photograph of Tree plantation:

6.3 Provision of Ramp for Divyangajan:
For easy movement of Divyangajan, the Institute has made provision of Ramp.
Photograph of Ramp:

6.3 Creation of Awareness about Energy Conservation:
The Institute has displayed posters emphasizing on importance of Energy Conservation.

Photograph of Poster on Energy Conservation:

ANNEXURE-I

LIST OF TREES & PLANTS IN THE CAMPUS

Presently the College Campus has more than 100 trees:

No	Name of Trees
1	Azadirachta Indica (Neem)
2	Cestrum nocturnum (Ratrani)
3	Tectona Grandis (Sagwan)
4	Thuja (Vidya)
5	Delonix Regia (Gulmohar)
6	Millettia pinnata (Karanj)
7	Lawsonia inermis (Mehendi)
8	Saraca asoca (Ashoka)
9	Alstonia scholaris (Saptparni)
10	Palm Tree

Shree Santkrupa College of Pharmacy Ghogaon

Principal
Dr. Ramling G. Patrakar
Shree Santkrupa College of Pharmacy
Ghogaon, Tal. Karad, Dist. Satara

Green/Environmental Audit Report

2021-22

GREEN AUDIT REPORT

of

Shree Santkrupa Shikshan Sanstha's

SHREE SANTKRUPA COLLEGE OF PHARMACY,

Ghogaon (Shivajinagar)

Dist. Satara (M.H.) – 415 111

Year: 2021-22

Prepared by:

Engress Services

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

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency

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

ENGRESS SERVICES

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

Ref: ES/SCP/21-22/02 Date: 22/05/2022

CERTIFICATE

This is to certify that we have conducted Green Audit at Shree Santkrupa College of Pharmacy, Ghogaon in the Academic year 2021-22.

The College has adopted following Green Initiatives:

- Usage of Energy Efficient LED Light Fitting
- Maximum Usage of Day Lighting
- Provision of Separate bins for Dry & Wet Waste
- The College has installed Septic Tank and is cleaned periodically.
- Implementation of Rain Water Management Project
- Maintenance of good Internal Road
- Tree Plantation in the campus
- Creation of awareness by Display of Posters on Resource Conservation

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

For Engress Services,

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

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ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of at Shree Santkrupa College of Pharmacy, Ghogaon, for awarding us the assignment of Green Audit of their Campus for the Academic Year: 2021-22.

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

EXECUTIVE SUMMARY

1. **Shree Santkrupa College of Pharmacy, Ghogaon** consumes Energy in the form of **Electrical Energy;** used for various Electrical Equipment, office & other facilities.

1. Present Energy Consumption & CO_2 Emissions:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	10608	9.5472
2	Maximum	1577	1.4193
3	Minimum	456	0.4104
4	Average	884	0.7956

3. Various initiatives taken for Energy Conservation:

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

4. Usage of Renewable Energy& CO_2 Emission Reduction:

- It is recommended to install roof-top solar PV Plant on college building.

5. Waste Management:

5.1 Segregation of Waste at Source:

The Waste is segregated at source and the recyclable waste, like paper, plastic waste is handed over to Authorized waste collecting agent for further recycling.

5.2 Organic Waste Management:

The Institute has a Bio Composting Pit, to convert the Leafy Waste into Bio Compost.

5.3 Liquid Waste Management:

The College has installed Septic and is cleaned periodically.

5.4E-Waste Management:

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

5.5 Sanitary Waste Incinerator:

It is recommended to install Sanitary Waste Incinerator for sanitary waste disposal.

6. Rain Water Management:

The College has Rain Water Management Project. The College has installed Pipes from the terrace and the Rain water falling on the terrace is used to increase the underground water table.

7. Green & Sustainable Initiatives

- Maintenance of good Internal Road
- Maintenance of Internal Garden
- Display of Posters on Resource Conservation
- Best Practices and Initiative for Social Awareness

8. Notes &Assumptions:

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

9. References:

- For CO_2 Emissions: www.tatapower.com
- For Roof Top Solar Energy Generation: www.solarrooftop.gov.in
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI &Water Quality Standards: www.cpcb.com

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

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 General Details of College: Table No 1:

No	Head	Particulars
1	Name of Institution	Shree Santkrupa College of Pharmacy, Ghogaon
2	Address	Ghogaon (Shivajinagar) Dist. Satara (M.H.) – 415 111
3	Affiliation	Shivaji University,Kolhapur

CHAPTER-II

STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Electrical Bill Analysis- 2021-22:

No	Month	Energy Purchased, kWh
1	Apr-21	1577
2	May-21	700
3	Jun-21	463
4	Jul-21	456
5	Aug-21	477
6	Sep-21	652
7	Oct-21	671
8	Nov-21	1072
9	Dec-21	1121
10	Jan-22	1402
11	Feb-22	1036
12	Mar-22	981
13	Total	10608
14	Maximum	1577
15	Minimum	456
16	Average	884

Chart No 1: Variation in Monthly Energy Consumption:

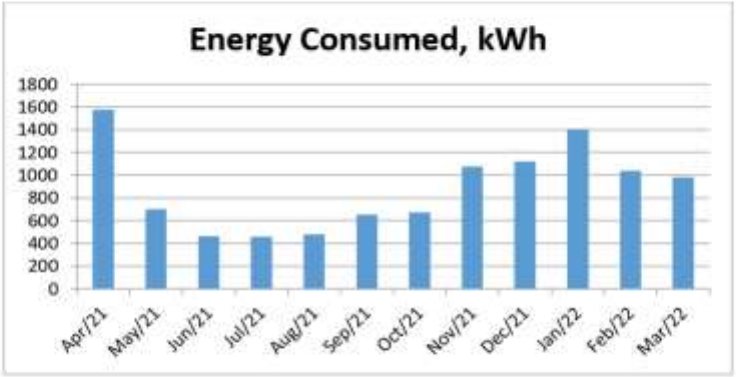

Table No 3: Variation in Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh
1	Total	10608
2	Maximum	1577
3	Minimum	456
4	Average	884

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 is as under.

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

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

Table No4: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Mar-21	1577	1.52
2	Apr-21	700	0.73
3	May-21	463	0.52
4	Jun-21	456	0.52
5	Jul-21	477	0.54
6	Aug-21	652	0.70
7	Sep-21	671	0.71
8	Oct-21	1072	1.08
9	Nov-21	1121	1.12
10	Dec-21	1402	1.36
11	Jan-22	1036	1.03
12	Feb-22	981	0.99
13	Total	10608	10.83
14	Maximum	1577	1.52
15	Minimum	456	0.52
16	Average	884	0.90

Chart No 2: Month wise CO_2Emissions:

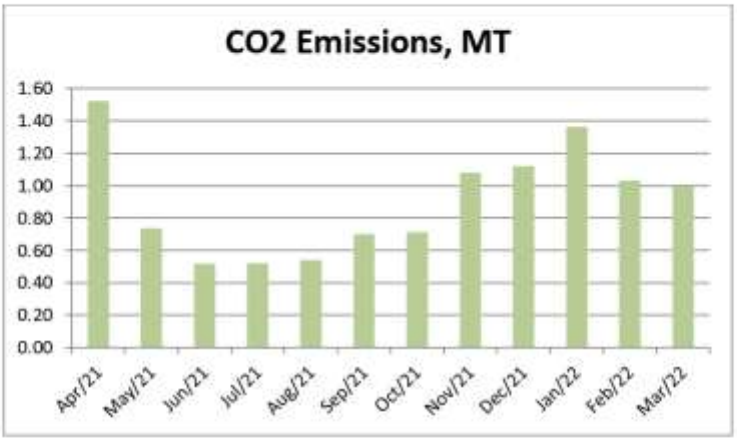

Table No 5: Variation in Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh	CO2 Emissions, MT
1	Total	10608	10.83
2	Maximum	1577	1.52
3	Minimum	456	0.52
4	Average	884	0.90

CHAPTER IV
STUDY OF USAGE OF RENEWABLE ENERGY

As on today College has not install solar roof-top PV plant.

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:
The Waste is segregated at source and the recyclable waste, like paper waste is handed over to authorized waste collecting agent for further recycling.

5.2 Bio Composting Pit:

The Institute has a Bio Composting Pit, to convert the Leafy Waste into Bio Compost.

Photograph of Bio Composting Pit:

5.3 Liquid Waste Management:
The College has installed Septic tank and is cleaned periodically.

5.4 E-Waste Management:

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

5.5 Sanitary Waste Incinerator:

The College has not install Sanitary Waste Incinerator. It is recommended to install Sanitary Waste Incinerator.

CHAPTER-VI

STUDY OF RAIN WATER MANAGEMENT

The Institute has implemented the Rain Water Management Project. The Institute has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used for recharging the water table.

Photograph of Rain Water Management Section:

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads:

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

Photograph of Internal Road:

7.2 Internal Tree Plantation:

The College has well maintained landscaped garden in the campus.

Photograph of Tree plantation:

ANNEXURE-1:

DETAILS OF TREES & PLANTS:

Presently the College Campus has more than 100 trees:

No	Name of Trees
1	Kadamba Tree
2	Gulmohor
3	Mangifera India
4	Coconut
5	Morpankhi
6	Cycus

Shree Santkrupa College of Pharmacy Ghogaon

Principal
Dr. Ramling G. Patrakar
Shree Santkrupa College of Pharmacy
Ghogaon, Tal. Karad, Dist. Satara

Green/Environmental Audit Report

2020-21

GREEN AUDIT REPORT
OF
SHREE SANTKRUPA COLLEGE OF PHARMACY,
Ghogaon (Shivajinagar)

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

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

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

Ref: EC/SCP/20-21/02 Date: 26/05/2021

CERTIFICATE

This is to certify that we have conducted Green Audit at Shree Santkrupa College of Pharmacy, Ghogaon in the Academic year 2020-21.

The College has adopted following Green Initiatives:

- Usage of Energy Efficient LED Light Fitting
- Maximum Usage of Day Lighting
- Provision of Separate bins for Dry & Wet Waste
- The College has installed Septic Tank and is cleaned periodically.
- Implementation of Rain Water Management Project
- Maintenance of good Internal Road
- Tree Plantation in the Campus
- Creation of awareness by Display of Posters on Resource 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

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EXECUTIVE SUMMARY

1. **Shree Santkrupa College of Pharmacy, Ghogaon** consumes Energy in the form of **Electrical Energy** used for various Electrical Equipment, Office & other facilities.

2. Present Energy Consumption & CO_2 Emissions:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	7132	6.418
2	Maximum	1239	1.115
3	Minimum	377	0.339
4	Average	594.33	0.534

3. Various initiatives taken for Energy Conservation:

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

4. Usage of Renewable Energy& CO_2 Emission Reduction:

- It is recommended to install roof-top solar PV Plant on college building.

5. Waste Management:

5.1 Segregation of Waste at Source:

The Waste is segregated at source in separate Waste Bins & is handed over for further action to Municipal Corporation.

5.2 Organic Waste Management:

The Institute has a Bio Composting Pit, to convert the Leafy Waste into Bio Compost.

5.3 Liquid Waste Management:

The College has installed Septic and is cleaned periodically.

5.4E-Waste Management:

It is recommended to dispose E-Waste through Authorized collecting agency.

5.5 Sanitary Waste Incinerator:

It is recommended to install Sanitary Waste Incinerator for sanitary waste disposal.

6. Rain Water Management:

The College has installed the Rainwater management project, the rain water falling on the terrace is collected and is used for increasing the under the underground water level.

7. Green & Sustainable Initiatives

- Maintenance of good Internal Road
- Maintenance of Internal Garden
- Display of Posters on Resource Conservation

8. Notes & Assumptions:

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

9. References:

- For CO_2 Emissions: www.tatapower.com

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

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 General Details of College: Table No 1:

No	Head	Particulars
1	Name of Institution	Shree Santkrupa College of Pharmacy, Ghogaon
2	Address	Ghogaon (Shivajinagar) Dist. Satara (M.H.) – 415 111
3	Affiliation	Shivaji University,Kolhapur

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Electrical Bill Analysis- 2020-21:

No	Month	Energy Purchased, kWh
1	Apr-20	1239
2	May-20	377
3	Jun-20	424
4	Jul-20	460
5	Aug-20	474
6	Sep-20	576
7	Oct-20	480
8	Nov-20	478
9	Dec-20	457
10	Jan-21	642
11	Feb-21	716
12	Mar-21	809
13	Total	7132
14	Maximum	1239
15	Minimum	377
16	Average	594.33

Chart No 1: Variation in Monthly Energy Consumption:

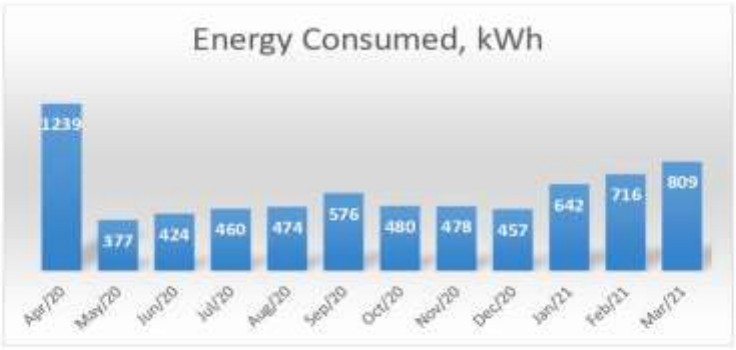


Table No 3: Variation in Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh
1	Total	7132

2	Maximum	1239
3	Minimum	377
4	Average	594.33

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 is as under.

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

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

Table No4: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-20	1239	1.115
2	May-20	377	0.339
3	Jun-20	424	0.381
4	Jul-20	460	0.414
5	Aug-20	474	0.426
6	Sep-20	576	0.518
7	Oct-20	480	0.432
8	Nov-20	478	0.430
9	Dec-20	457	0.411
10	Jan-21	642	0.577
11	Feb-21	716	0.644
12	Mar-21	809	0.728
13	Total	7132	6.418
14	Maximum	1239	1.115
15	Minimum	377	0.339
16	Average	594.333	0.534

Chart No 2: Month wise CO_2Emissions:

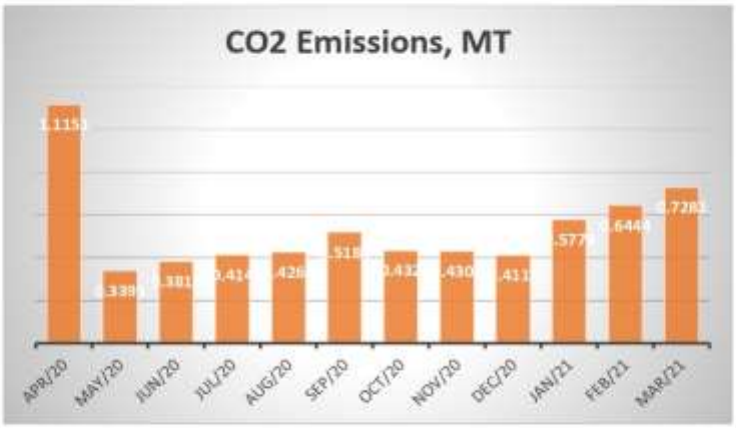


Table No 5: Variation in Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh	CO2 Emissions, MT
1	Total	7132	6.418
2	Maximum	1239	1.115
3	Minimum	377	0.339
4	Average	594.333	0.534

CHAPTER IV
STUDY OF USAGE OF RENEWABLE ENERGY

As on today College has not install solar roof-top PV plant, Solar thermal water heating plant, it is recommend to install solar rooftop plant on the College building.

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:
The Waste is segregated at source and the recyclable waste, like paper waste is handed over to authorized waste collecting agent for further recycling.

5.2 Organic Waste Management:
The Institute has a Bio Composting Pit, to convert the Leafy Waste into Bio Compost.

5.3 Liquid Waste Management:
The College has installed Septic tank and is cleaned periodically.

5.4 E-Waste Management:
The E-Waste is disposed of through Authorized Agency.

5.5 Sanitary Waste Incinerator:
The College has not install Sanitary Waste Incinerator. It is recommended to install Sanitary Waste Incinerator.

CHAPTER-VI

STUDY OF RAIN WATER MANAGEMENT

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

Photograph of Rain Water Management Pipe:

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads:

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

Photograph of Internal Road:

7.2 Internal Tree Plantation:

The College has well maintained landscaped garden in the campus.

Photograph of Tree plantation:

7.3 Provision of Ramp:

The College has facility for ramp, for easy movement for Divyaang.

ANNEXURE-1:
DETAILS OF TREES& PLANTS:

Presently the College Campus has well maintained medicinal plantation:

No	Name of Trees
1	Kadamba Tree
2	Gulmohor
3	Mangifera India
4	Coconut
5	Morpankhi
6	Cycus

Shree Santkrupa College of Pharmacy Ghogaon

Principal
Dr. Ramling G. Patrakar
Shree Santkrupa College of Pharmacy
Ghogaon, Tal. Karad, Dist. Satara

Energy Audit Reports

Energy Audit Report

2022-23

ENERGY AUDIT REPORT

of

Shree Santkrupa Shikshan Sanstha's

SHREE SANTKRUPA COLLEGE OF PHARMACY,

Ghogaon (Shivajinagar) Dist. Satara (M.H.) – 415 111

Year: 2022-23

Prepared by:

M/s.Chandrakant Electricals,Co.
Shetphale, Tal: Atpadi
Sangali 415 306
Phone: 09423272440 Email: chandrakant.electricals23666@gmail.com

M/s.Chandrakant Electricals, Co.
Shetphale, Tal: Atpadi Sangali 415 306 Phones: 09423272440
Email: chandrakant.electricals23666@gmail.com

ENERGY AUDIT CERTIFICATE

Certificate No: CE/SCP/22-23/01 **Date: 07/11/2023**

This is to certify that we have conducted an Energy Audit at Shree Santkrupa College of Pharmacy, Ghogaon, in the Year 2022-23.

.The Institute has adopted following Energy Efficient practices:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting
- Installation of Solar Power Plant

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

For, M/s.Chandrakant Electricals, Co.

(Chandrakant Nanvare)

MEDA Registration Certificates

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: eee@mahaurja.com, Web: www.mahaurja.com

ECN/2022-23/CR-01/1708 — 10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'B'

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. Chandrakant Electrical, Co.
A/P: Shetphale, Tal: Atpadi,
Dist.: Sangli – 415 306.

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

Registration Number : ***MEDA/ECN/2022-23/Class B/EA-09.***

- 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)

INDEX

ACKNOWLEDGEMENT

We M/s.Chandrakant Electricals, Co.,Sangli, express our sincere gratitude to the management of Shree Santkrupa College of Pharmacy, Ghogaon for awarding us the assignment of Energy Audit of their Campus for the Year: 2022-23.

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

EXECUTIVE SUMMARY

1. **Shree Santkrupa College of Pharmacy, Ghogaon** consumes Energy in the form of **Electrical Energy;** used for various Electrical Equipment, office & other facilities.

2. **Present Connected Load & Annual Energy Consumption:**

No	Particulars	Value	Unit
1	Total Connected Load	52	kW
2	Annual Energy Consumption	18593	kWh
3	Annual CO_2 Emissions	17.13	MT

3. **Energy Performance Index:**

No	Particulars	Value	Unit
1	Total Annual Energy Consumed	18593	kWh
2	Total Built up area of Institute	5901.66	m^2
3	Energy Performance Index =(1) / (2)	**3.15**	kWh/m^2

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

No	Particulars	Value	Unit
1	Lighting Power Density	**0.86**	W/m^2
2	% of Usage of LED Lighting to Total Lighting Load	**4.41**	%

5. **Renewable Energy & Energy Efficiency Projects:**

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting
- Installation of 25 Kw Capacity Solar Power Plant

6. **Assumption:**

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

7. **References:**

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

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

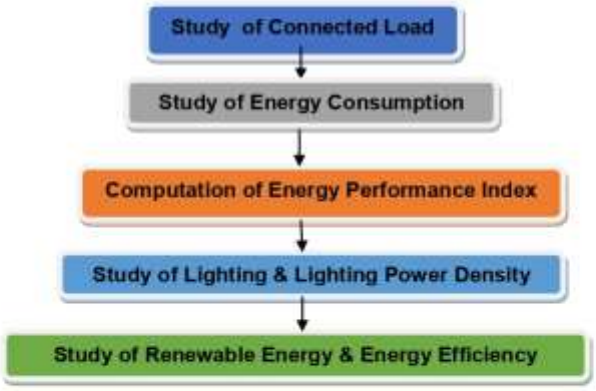
CHAPTER-I
INTRODUCTION

1.1 Introduction:

An Energy Audit is conducted at Shree Santkrupa College of Pharmacy, Ghogaon.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 Institute Location Image:

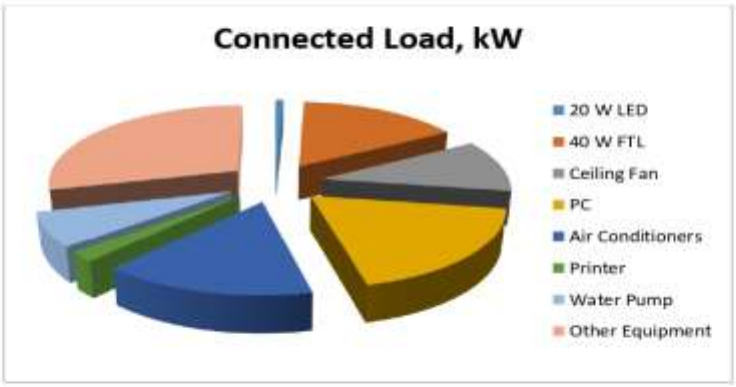
CHAPTER-II
STUDY OF CONNECTED LOAD

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

Table No 1: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	20 W LED	19	20	0.38
2	40 W FTL	206	40	8.24
3	Ceiling Fan	86	65	5.59
4	PC	65	150	9.75
5	Air Conditioners	4	2000	8
6	Printer	7	150	1.05
7	Water Pump	1	3730	3.73
8	Other Equipment	100	150	15
9	**Total**			**52**

Chart No 1: Study of Connected Load:



CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Electrical Bill Analysis- 2022-23:

No	Month	Energy Consumed, kWh	LPG Consumption, Kg	CO2 Emissions, MT
1	Apr-22	1143	10	1.06
2	May-22	1356	12	1.25
3	Jun-22	1440	11	1.33
4	Jul-22	1560	13	1.44
5	Aug-22	1725	12	1.58
6	Sep-22	1668	14	1.54
7	Oct-22	1710	14	1.58
8	Nov-22	1653	13	1.52
9	Dec-22	1473	14	1.36
10	Jan-23	1650	12	1.52
11	Feb-23	1563	12	1.44
12	Mar-23	1652	12	1.52
13	Total	18593	149	17.13
14	Maximum	1725	14	1.58
15	Minimum	1143	10	1.06
16	Average	1549.41	12.42	1.43

Chart No 2: Variation in Monthly Energy Consumption:

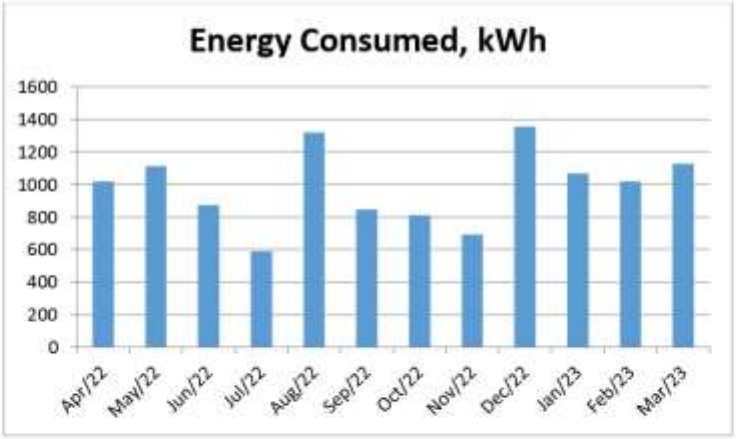


Chart No 3: Variation in Monthly LPG Consumption:

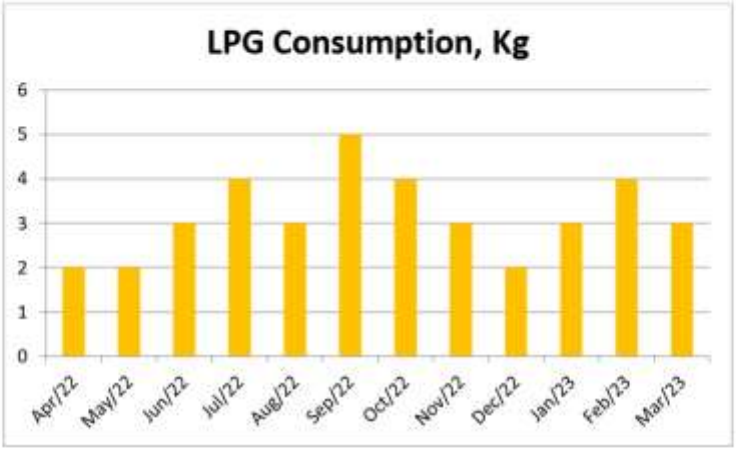


Table No 4: Variation in Important Parameters:

No	Parameter/ Variation	Energy Consumed, kWh	LPG Consumption, Kg	CO_2 Emissions, MT
1	Total	18593	149	17.13
2	Maximum	1725	14	1.58
3	Minimum	1143	10	1.06
4	Average	1549.41	12.42	1.43

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 Institute as under:

Table No4: Computation of Energy Performance Index:

No	Particulars	Value	Unit
1	Total Annual Energy Consumed	18593	kWh
2	Total Built up area of Institute	5901.66	m^2
3	Energy Performance Index =(1) / (2)	**3.15**	kWh/m^2

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: Lighting Power Density of a Class Room. We also compute the percentage usage of LED Lighting to total Lighting Load of the Institute.

Table No 5: Computation of Lighting Power Density:

No	Particulars	Value	Unit
1	No of 20 W LED Tube Lights in Class Room	04	Nos
2	Demand of 20 W LED Tube Light	20	W/Unit
3	Total Lighting Load in the Class Room= **(1) * (2)**	**80**	W
4	Area of Class Room	92.47	m^2
5	Lighting Power Density = **(3)/ (4)**	**0.86**	W/m^2

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

Table No 6: Percentage Usage of LED Lighting to Annual Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	206	Nos
2	Demand of 40 W FTL Fitting	40	W/Unit
3	Total Electrical Load of 40 W FTL Fittings	**8.24**	kW
4	No of 20 W LED Tube Lights	19	Nos
5	Demand of 20 W LED Tube Light	20	W/Unit
6	Total Electrical Load of 20 W LED Fittings	**0.38**	kW
7	Annual Total Lighting Load = 3+6	**8.62**	kWh
8	Annual LED Lighting Load = 6	**0.38**	kWh
9	**Annual Lighting Requirement met by LED= 8*100/7**	**4.41**	%

CHAPTER-VI
STUDY OF RENEWABLE ENERGY & ENERGY EFFICIENCY

The Institute has installed a **25 kWp** capacity Roof top Solar PV Plant this year.
Now we compute the Percentage of Alternate Energy to Annual Energy demand:

Table No 7: Computation of % Annual Energy Demand met by Alternate Energy:

No	Particulars	Value	Unit
1	Energy Purchased from MSEDCL	18593	kWh
2	Installed Roof Top Solar PV Plant Capacity	25	kWp
3	Average Daily Energy Generated	4	kWh/kWp
4	Annual Generation Days	300	Nos
5	Annual Solar Energy Generated	30000	kWh
6	Total Energy Demand = (1) + (5)	35887	kWh
7	Expecting % of Usage of Alternate Energy to Total Annual Energy Demand for Current Year Consumption= (5)*100/ (6)	61	%

Shree Santkrupa College of Pharmacy Ghogaon

Principal
Dr. Ramling G. Patrakar
Shree Santkrupa College of Pharmacy
Ghogaon, Tal. Karad, Dist. Satara

Energy Audit Report

2021-22

ENERGY AUDIT REPORT

of

Shree Santkrupa Shikshan Sanstha's

SHREE SANTKRUPA COLLEGE OF PHARMACY,

Ghogaon (Shivajinagar)

Dist. Satara (M.H.) – 415 111

Year: 2021-22

Prepared by:

M/s.Chandrakant Electricals,Co.
Shetphale, Tal: Atpadi
Sangali 415 306
Phone: 09423272440 Email: chandrakant.electricals23666@gmail.com

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-01/1708 10th May, 2022

CERTIFICATE OF REGISTRATION
FOR CLASS 'B'

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. Chandrakant Electrical, Co.
A/P: Shetphale, Tal: Atpadi,
Dist.: Sangli – 415 306.

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

Registration Number : ***MEDA/ECN/2022-23/Class B/EA-09.***

- 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)

M/s.Chandrakant Electricals, Co.
Shetphale, Tal: Atpadi Sangali 415 306 Phones: 09423272440
Email: chandrakant.electricals23666@gmail.com

Ref: CE/SCP/21-22/01 Date: 20/06/2022

CERTIFICATE

This is to certify that we have conducted Energy Audit at Shree Santkrupa College of Pharmacy, Ghogaon 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

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

For, M/s.Chandrakant Electricals, Co.

(Chandrakant Nanvare)

INDEX

ACKNOWLEDGEMENT

We M/s.Chandrakant Electricals,Co.Sangli, express our sincere gratitude to the management of Shree Santkrupa College of Pharmacy, Ghogaon for awarding us the assignment of Energy Audit of their Campus for the Academic Year: 21-22.

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

EXECUTIVE SUMMARY

1. **Shree Santkrupa College of Pharmacy, Ghogaon** consumes Energy in the form of **Electrical Energy** used for various Electrical Equipment, office & other facilities.

2. **Present Energy Consumption & CO_2 Emission:**

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	10608	9.5472
2	Maximum	1577	1.4193
3	Minimum	456	0.4104
4	Average	884	0.7956

3. **Energy Conservation projects already installed:**

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

4. **Usage of Alternate Energy:**

- As on today College has not installed solar rooftop power plant. It is recommended to install solar power rooftop system on the college building as per availability of funds.

5. **Usage of LED Lighting:**

- The Total Lighting Load is **8.62 KW**
- The Total LED Lighting Load is **0.38 KW.**
- The percentage of Annual LED Lighting to Annual Lighting Demand is **4.41 %.**

6. **Assumptions:**

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2 into atmosphere.
2. **100 LPD** Solar Thermal System saves **1500 kWh** of Electrical Energy per Annum.
3. Average Energy generated by **1 kWp** Solar PV Plant: **4 kWh/Day.**
4. Annual Solar Energy Generation Days: **300 Nos.**

7. **References:**

- For CO_2 Emissions: www.tatapower.com
- For Roof Top Solar Energy Generation: www.solarrooftop.gov.in
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI &Water Quality Standards: www.cpcb.com

ABBREVIATIONS

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

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2Table No 1: General Details of the College:

No	Head	Particulars
1	Name of Institution	Shree Santkrupa College of Pharmacy, Ghogaon
2	Address	Ghogaon (Shivajinagar) Dist. Satara (M.H.) – 415 111
3	Affiliation	Shivaji University,Kolhapur

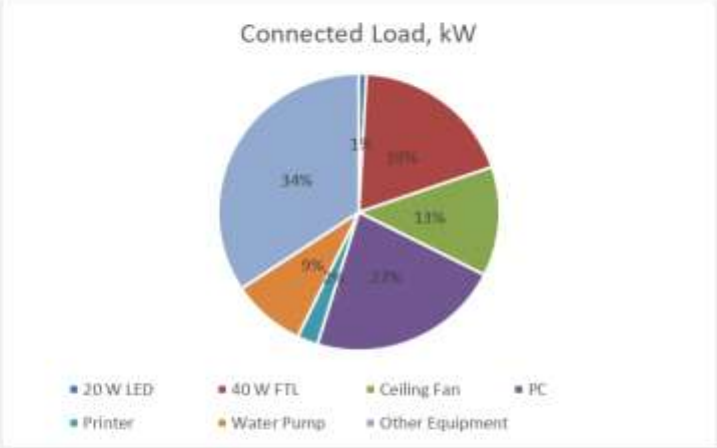
CHAPTER-II
STUDY OF CONNECTED LOAD

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

Table No 2: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	20 W LED	19	20	0.38
2	40 W FTL	206	40	8.24
3	Ceiling Fan	86	65	5.59
4	PC	65	150	9.75
5	Printer	7	150	1.05
6	Water Pump	1	3730	3.73
7	Other Equipment	100	150	15
8	**Total**			**44**

Chart No 1: Study of Connected Load:



CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

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

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

No	Month	Energy Consumed, kWh	LPG Consumption, Kg	CO2 Emissions, MT
1	Apr-21	1577	38	1.52
2	May-21	700	39	0.73
3	Jun-21	463	37	0.52
4	Jul-21	456	41	0.52
5	Aug-21	477	42	0.54
6	Sep-21	652	42	0.70
7	Oct-21	671	40	0.71
8	Nov-21	1072	42	1.08
9	Dec-21	1121	41	1.12
10	Jan-22	1402	38	1.36
11	Feb-22	1036	37	1.03
12	Mar-22	981	41	0.99
13	Total	10608	478	10.83
14	Maximum	1577	42	1.52
15	Minimum	456	37	0.52
16	Average	884	39.83	0.90

Chart No 2: Variation in Monthly Energy Consumption:

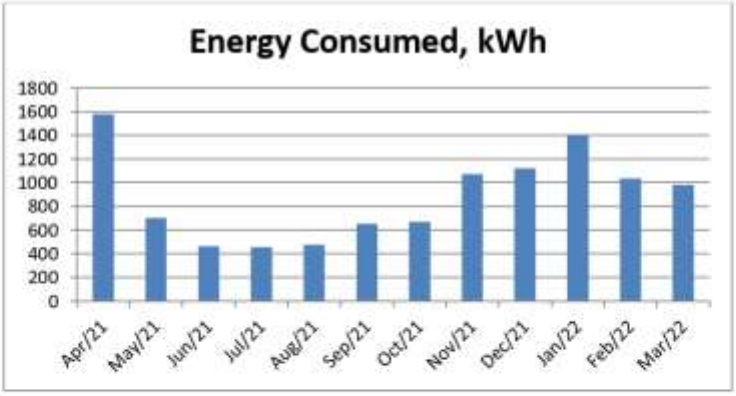


Chart No 3: Variation in Monthly LPG Consumption:

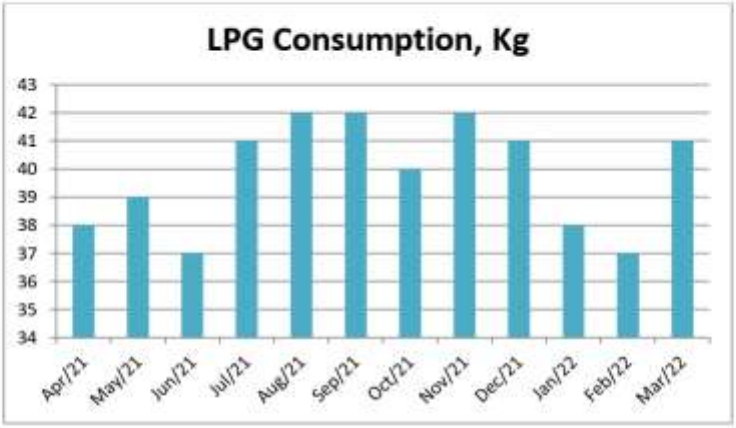


Table No 4: Variation in Important Parameters:

No	Parameter/ Variation	Energy Consumed, kWh	LPG Consumption, Kg	CO_2 Emissions, MT
1	Total	10608	478	10.83
2	Maximum	1577	42	1.52
3	Minimum	456	37	0.52
4	Average	884	39.83	0.90

CHAPTER-IV
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 taking into account the usage of the Electrical Energy.

Basis for computation of CO_2 Emissions:

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

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

Table No5: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO2 Emissions, MT
1	Apr-21	1577	1.52
2	May-21	700	0.73
3	Jun-21	463	0.52
4	Jul-21	456	0.52
5	Aug-21	477	0.54
6	Sep-21	652	0.70
7	Oct-21	671	0.71
8	Nov-21	1072	1.08
9	Dec-21	1121	1.12
10	Jan-22	1402	1.36
11	Feb-22	1036	1.03
12	Mar-22	981	0.99
13	Total	10608	10.83
14	Maximum	1577	1.52
15	Minimum	456	0.52
16	Average	884	0.90

Chart No 3: Month wise CO_2 Emissions:

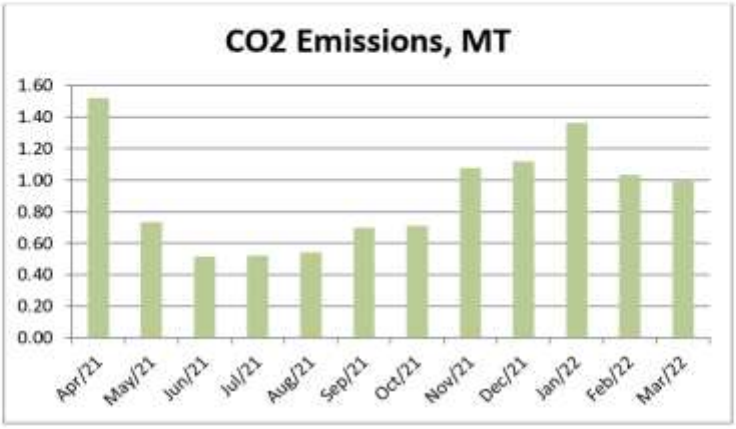


Table No 6: Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh	CO2 Emissions, MT
1	Total	10608	10.83
2	Maximum	1577	1.52
3	Minimum	456	0.52
4	Average	884	0.90

CHAPTER V
STUDY OF USAGE OF ALTERNATE ENERGY

As on today College has not install solar roof-top PV plant, It is recommended to install solar roof-top PV plant on the college building.

CHAPTER VI
STUDY OF USAGE OF LED LIGHTING

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

Table No 8: Percentage of Usage of LED Lighting to Annual Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	206	Nos
2	Demand of 40 W FTL Fitting	40	W/Unit
3	Total Electrical Load of 40 W FTL Fittings	**8.24**	kW
4	No of 20 W LED Tube Lights	19	Nos
5	Demand of 20 W LED Tube Light	20	W/Unit
6	Total Electrical Load of 20 W LED Fittings	**0.38**	kW
7	Annual Total Lighting Load = 3+6	**8.62**	kWh
8	Annual LED Lighting Load = 6	**0.38**	kWh
9	**Annual Lighting Requirement met by LED= 8*100/7**	**4.41**	**%**

Shree Santkrupa College of Pharmacy Ghogaon

Principal
Dr. Ramling G. Patrakar
Shree Santkrupa College of Pharmacy
Ghogaon, Tal. Karad, Dist. Satara

Energy Audit Report

2020-21

ENERGY AUDIT REPORT
OF
SHREE SANTKRUPA COLLEGE OF PHARMACY,
Ghogaon (Shivajinagar)

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

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

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

Ref: EC/SCP/20-21/01 Date: 26/05/2021

CERTIFICATE

This is to certify that we have conducted Energy Audit at Shree Santkrupa College of Pharmacy, Ghogaon in the Academic year 2020-21.

The College has adopted following Energy Efficient practices:

- Maximum usage of Day Lighting
- Usage of Energy Efficient LED Light Fitting

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

INDEX

ACKNOWLEDGEMENT

We Enrich Consultants, Pune, express our sincere gratitude to the management of Shree Santkrupa College of Pharmacy, Ghogaon for awarding us the assignment of Energy Audit of their Campus for the Academic Year: 20-21.

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

EXECUTIVE SUMMARY

1. **Shree Santkrupa College of Pharmacy, Ghogaon** consumes Energy in the form of **Electrical Energy** used for various Electrical Equipment, Office & other facilities.

2. Present Energy Consumption& CO_2 Emission:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	7132	6.418
2	Maximum	1239	1.115
3	Minimum	377	0.339
4	Average	594.33	0.534

3. Energy Conservation projects already installed:

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

4. Usage of Alternate Energy:

- As on today College has not installed solar rooftop power plant. It is recommended to install solar power rooftop system on the college building as per availability of funds.

5. Usage of LED Lighting:

- The Total Lighting load of College is **8.62 kW.**
- The LED Lighting Load is **0.38 kW.**
- The % of LED Lighting to Total Lighting Load is **4.41 %.**

6. Assumptions:

1. **1 kWh**of Electrical Energy releases **0.9 Kg** of **CO_2**into atmosphere
2. **100 LPD**Solar Thermal System saves **1500 kWh**of Electrical Energy per Annum.
3. Daily working hours-**4 Nos**(For Lighting Calculations)
4. Annual working Days-**120 Nos**(For Lighting Calculations)

7. References:

- For CO_2 Emissions: www.tatapower.com

ABBREVIATIONS

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

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study present Energy Consumption
2. To Study the present CO_2 Emissions
3. To study usage of Alternate Energy
4. To study usage of LED Lighting

1.2Table No 1: General Details of the College:

No	Head	Particulars
1	Name of Institution	Shree Santkrupa College of Pharmacy, Ghogaon
2	Address	Ghogaon (Shivajinagar) Dist. Satara (M.H.) – 415 111
3	Affiliation	Shivaji University,Kolhapur

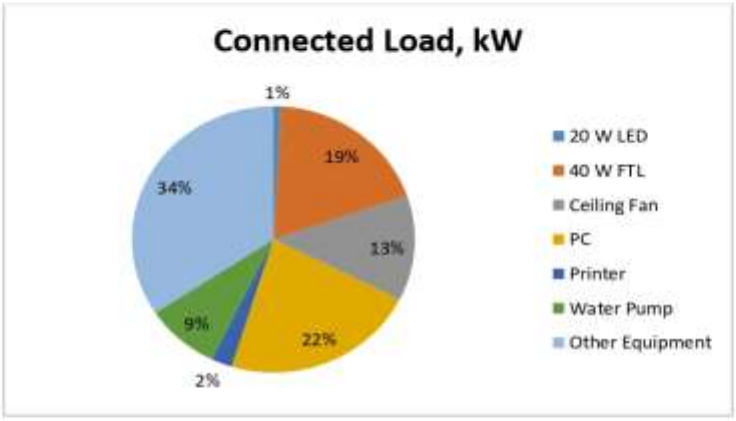
CHAPTER-II
STUDY OF CONNECTED LOAD

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

Table No 2: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	20 W LED	19	20	0.38
2	40 W FTL	206	40	8.24
3	Ceiling Fan	86	65	5.59
4	PC	65	150	9.75
5	Printer	7	150	1.05
6	Water Pump	1	3730	3.73
7	Other Equipment	100	150	15
8	**Total**			**44**

Chart No 1: Study of Connected Load:



CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

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

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

No	Month	Energy Purchased, kWh
1	Apr-20	1239
2	May-20	377
3	Jun-20	424
4	Jul-20	460
5	Aug-20	474
6	Sep-20	576
7	Oct-20	480
8	Nov-20	478
9	Dec-20	457
10	Jan-21	642
11	Feb-21	716
12	Mar-21	809
13	Total	7132
14	Maximum	1239
15	Minimum	377
16	Average	594.33

Chart No 2: Variation in Monthly Energy Consumption:

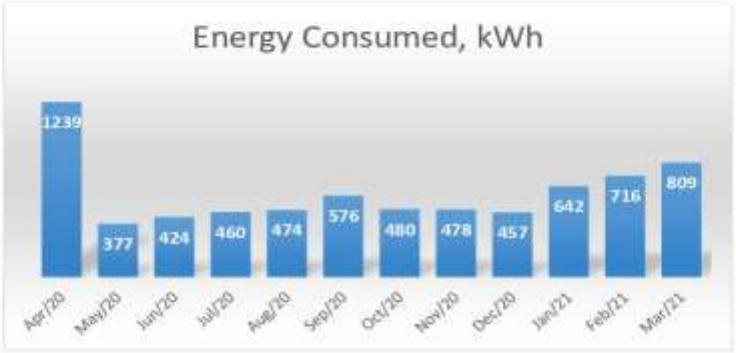


Table No4: Variation in Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh
1	Total	7132
2	Maximum	1239
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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.

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

Basis for computation of CO_2 Emissions:

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Table No5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Apr-20	1239	1.115
2	May-20	377	0.339
3	Jun-20	424	0.381
4	Jul-20	460	0.414
5	Aug-20	474	0.426
6	Sep-20	576	0.518
7	Oct-20	480	0.432
8	Nov-20	478	0.430
9	Dec-20	457	0.411
10	Jan-21	642	0.577
11	Feb-21	716	0.644
12	Mar-21	809	0.728
13	Total	7132	6.418
14	Maximum	1239	1.115
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Chart No 3: Month wise CO_2Emissions:

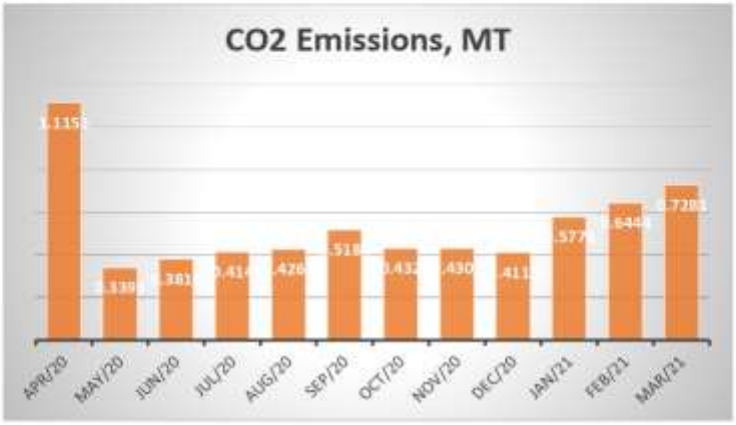

Table No 6: Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh	CO2 Emissions, MT
1	Total	7132	6.418
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4	Average	594.333	0.534

CHAPTER V
STUDY OF USAGE OF ALTERNATE ENERGY

As on today College has not install solar roof-top PV plant, Solar thermal water heating plant; the percentages of uses of alternate energy to the annual energy demand work to be zero percent.

CHAPTER VI
STUDY OF USAGE OF LED LIGHTING

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

Table No 8: Percentage of Usage of LED Lighting to Annual Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	206	Nos
2	Demand of 40 W FTL Fitting	40	W/Unit
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