GREEN AUDIT REPORT

of

Dakshin Solapur Taluka Shikshan Mandal's,

COLLEGE OF PHARMACY, SOLAPUR

Jule Solapur-1, Vijapur Road, Solapur

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.

30/11

(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/DSTSCOP/17-18/02 Date: 14/6/2018

CERTIFICATE

This is to certify that we have conducted Green Audit at Dakshin Solapur Taluka Shikshan Mandal's, College of Pharmacy, Solapur in the Year 2017-18.

The College has adopted following Energy Efficient and Green Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 10 kWp
- Segregation of Waste at Source
- Vermi Composting arrangement for Conversion of Organic Waste
- Installation of Rain Water Management Project
- Good Internal Road
- Tree Plantation in the campus

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

ENRICH CONSULTANTS PUNE

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor, EA-8192

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dakshin Solapur Taluka Shikshan Mandal's, College of Pharmacy, Solapur for awarding us the assignment of Green Audit of their Solapur Campus, for the Academic Year: 2017-18.

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

EXECUTIVE SUMMARY

1. Dakshin Solapur Taluka Shikshan Mandal's, College of Pharmacy, Solapur consumes Energy in the form of **Electrical Energy and LPG** used for various gadgets, office & other facilities

2. Present Energy Consumption & CO_2 Emission:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Total	20197	266	16.87
2	Maximum	3017	38	2.46
3	Minimum	615	19	0.54
4	Average	1683.08	22.17	1.41

3. Energy Conservation Measures adopted:

- Usage of Energy Efficient LED fittings
- Installation of 10 kWp Roof Top Solar PV Plant

4. Usage of Renewable Energy & CO_2 Emission Reduction:

- The College has yet to install Roof Top Solar PV Plant of Capacity **10 kWp**
- Energy generated by Solar PV Plant in 17-18 is **12000 kWh**
- Annual Reduction in CO2 Emissions in 17-18 is **10.8 MT.**

5. Waste Management:

5.1 Segregation of Waste at Source:

The solid waste is segregated at source. Waste Bins are located at various locations.

5.2 Organic Waste Management:

A Vermi Composting Arrangement is used to convert the Organic waste into Bio compost.

6. Rain Water Management:

The College has installed Rain Water Management Project, wherein the Rain Water from terrace is collected and is used to recharge the bore well.

7. Green Practices:

- Maintenance of good Internal Road & Tree Plantation

8. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.8 Kg** of **CO_2**into atmosphere
2. **1 Kg** of LPG releases **2.68 Kg of CO_2** into atmosphere
3. **1 kWp** of Solar PV Plant generates **4 kWh** of Energy per Day
4. Annual Solar Energy generation Days: **300 Nos**

9. Reference: Solar PV Energy generation: www.solarrooftop.gov.in

ABBREVIATIONS

DSTS	Dakshin Solapur Taluka Shikshan
kWh	Kilo Watt Hour
kWp	Kilo Watt Peak
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
LPG	Liquefied Petroleum Gas

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No 1: General Details of the College:

No	Head	Particulars
1	Name of College	Solapur Taluka Shikshan Mandal's College of Pharmacy, Solapur
2	Address	Jule Solapur-1, Vijapur Road, Solapur 413 004
3	Affiliation	Punyashlok Ahilyadevi Holkar University, Solapur

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Study of Electrical Energy & LPG Consumption: 17-18:

No	Month	Energy Purchased, kWh	LPG Consumption, Kg
1	Apr-17	1369	19
2	May-17	1405	19
3	Jun-17	1675	38
4	Jul-17	1702	19
5	Aug-17	1262	38
6	Sep-17	1196	19
7	Oct-17	3017	19
8	Nov-17	2020	19
9	Dec-17	1904	19
10	Jan-18	2446	19
11	Feb-18	615	19
12	Mar-18	1586	19
13	Total	20197	266
14	Maximum	3017	38
15	Minimum	615	19
16	Average	1683.08	22.17

Chart No: 1: Study of variation of Monthly Electrical Energy Consumption:

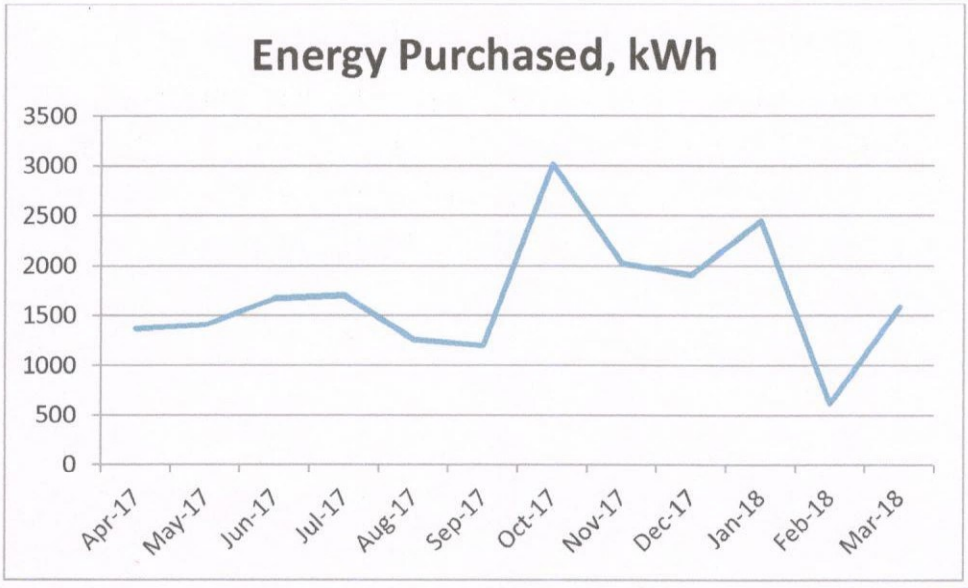


Chart No 2: Study of Month wise LPG Consumption:

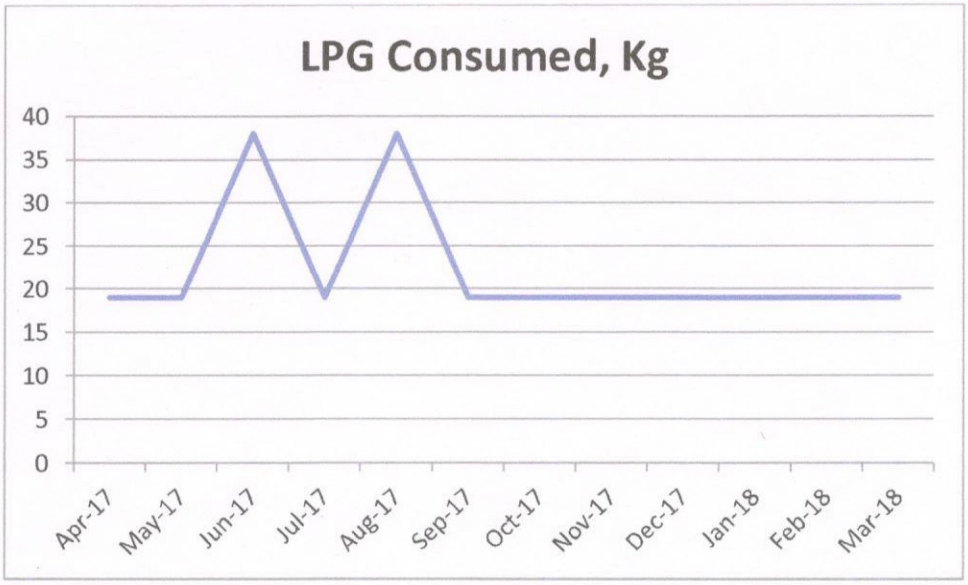


Table No 3: Variation in Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	20197	266
2	Maximum	3017	38
3	Minimum	615	19
4	Average	1683.08	22.17

CHAPTER-III
STUDY OF 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 College for performing its day to day activities

The College uses two forms of Energy namely: Electrical Energy for various Electrical gadgets and LPG.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to LPG & Electrical Energy are as under

- **1 kWh** of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere
- **1 Kg of LPG** releases **2.68 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	LPG Consumption, Kg	CO_2 Emissions, MT
1	Apr-17	1369	19	1.15
2	May-17	1405	19	1.17
3	Jun-17	1675	38	1.44
4	Jul-17	1702	19	1.41
5	Aug-17	1262	38	1.11
6	Sep-17	1196	19	1.01
7	Oct-17	3017	19	2.46
8	Nov-17	2020	19	1.67
9	Dec-17	1904	19	1.57
10	Jan-18	2446	19	2.01
11	Feb-18	615	19	0.54
12	Mar-18	1586	19	1.32
13	Total	20197	266	16.87
14	Maximum	3017	38	2.46
15	Minimum	615	19	0.54
16	Average	1683.08	22.17	1.41

Chart No: 3: Representation of Month wise CO_2 Emissions:

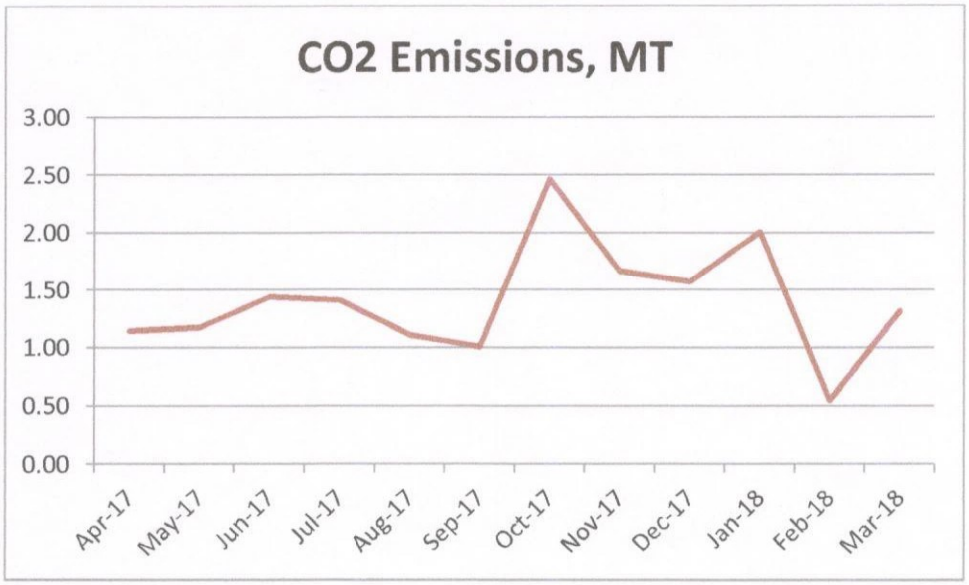


Table No 5: Variation in Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Total	20197	266	16.87
2	Maximum	3017	38	2.46
3	Minimum	615	19	0.54
4	Average	1683.08	22.17	1.41

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed a Roof Top Solar PV Plant of capacity **10 kWp.**

In the following Table we present the Annual Reduction in CO_2 Emissions due to Solar PV Plant.

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

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	10	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**12000**	kWh
5	1 kWh of Electrical Energy emits	**0.9**	Kg of CO_2
6	Annual Reduction in CO2 Emissions = (4) * (5) /1000	**10.8**	MT

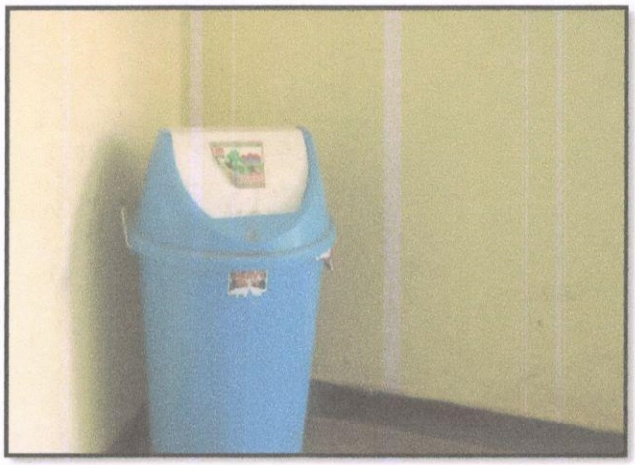
Photograph of Roof Top Solar PV Plant:

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The solid waste is segregated at source. There are separate bins for collection of Waste at various points.

Photograph of Waste Collection Bin:



5.2 Organic Waste Management:

A Vermi composting Bed is used to convert the Organic waste into Bio compost.

Photograph of Bio Composting Pit:

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and bore well is recharged through this Rain water.

Photograph of Underground Rain Water Carrying Pipe:

CHAPTER-VII
STUDY OF GREEN PRACTICES

7.1 Pedestrian Friendly Road:

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

Photograph of internal road in the campus:

7.2 Internal Tree Plantation:

The College has well maintained Tree Plantation & Medicinal Plant Garden.

Photograph of Internal Tree Plantation:

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

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

ENRICH CONSULTANTS PUNE

Enrich Consultants

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Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/DSTSCOP/18-19/02

Date: 24/6/2019

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- Vermi Composting Bed for Conversion of Organic Waste
- Provision of Sanitary Waste Incinerator, for disposal of Sanitary Waste
- Installation of Rain Water Management Project
- Good Internal Road
- Tree Plantation in the campus

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

For Enrich Consultants,

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2. Present Energy Consumption & CO_2 Emission:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Total	11657	266	10.04
2	Maximum	3127	57	2.55
3	Minimum	0	9	0.05
4	Average	971.42	22.17	0.84

3. Energy Conservation Measures adopted:

- Usage of Energy Efficient LED fittings
- Installation of 10 kWp Roof Top Solar PV Plant

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

- The College has yet to install Roof Top Solar PV Plant of Capacity **10 kWp**
- Energy generated by Solar PV Plant in 18-19 is **12000 kWh**
- Annual Reduction in CO2 Emissions in 18-19 is **10.8 MT.**

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The E Waste is disposed of through M/s. Mahalaxmi e Recyclers Pvt. Ltd.

6. Rain Water Management:

The College has installed Rain Water Management Project, wherein the Rain Water from terrace is collected and is used to recharge the bore well.

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- Maintenance of good Internal Road
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Table No 2: Study of Electrical Energy & LPG Consumption: 18-19:

No	Month	Energy Purchased, kWh	LPG Consumption, Kg
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2	May-18	386	10
3	Jun-18	507	9
4	Jul-18	693	10
5	Aug-18	1446	57
6	Sep-18	1367	38
7	Oct-18	0	19
8	Nov-18	3127	19
9	Dec-18	496	38
10	Jan-19	378	19
11	Feb-19	741	19
12	Mar-19	1011	19
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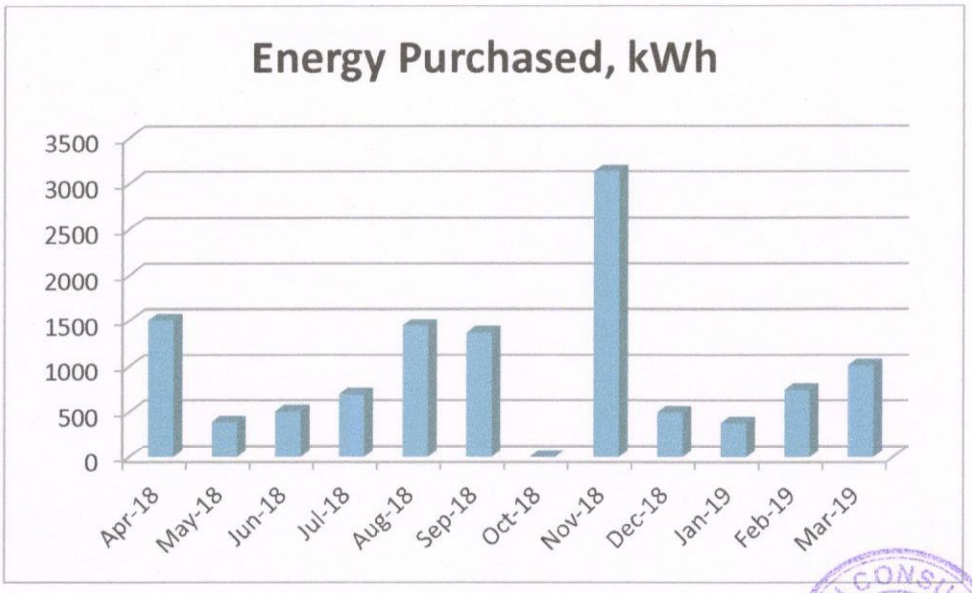

Chart No 2: Study of Month wise LPG Consumption:

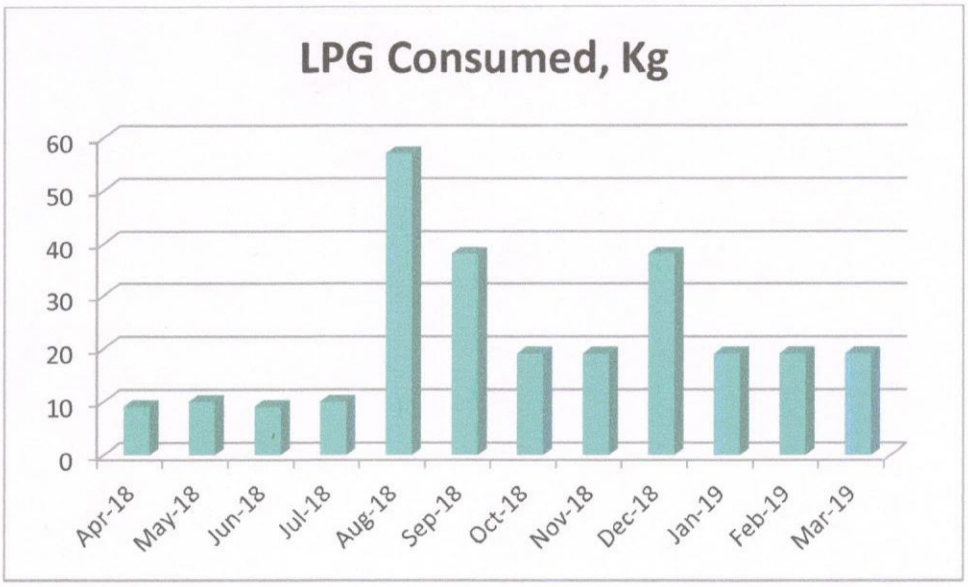

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Table No 4: Month wise CO_2 Emissions:

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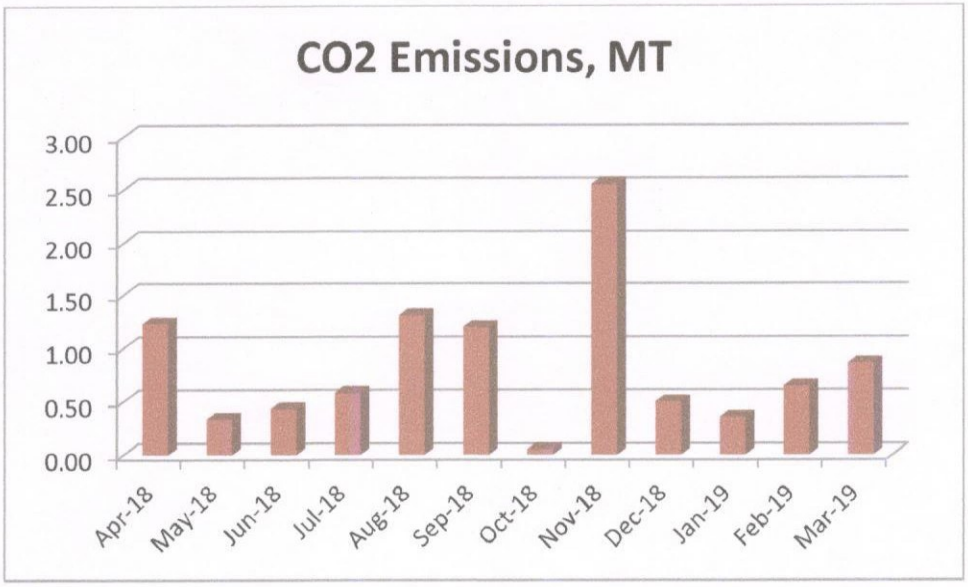
Chart No: 3: Representation of Month wise CO_2 Emissions:



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No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
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CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed a Roof Top Solar PV Plant of capacity **10 kWp.**

In the following Table we present the Annual Reduction in CO_2 Emissions due to Solar PV Plant.

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

No	Particulars	Value	Unit
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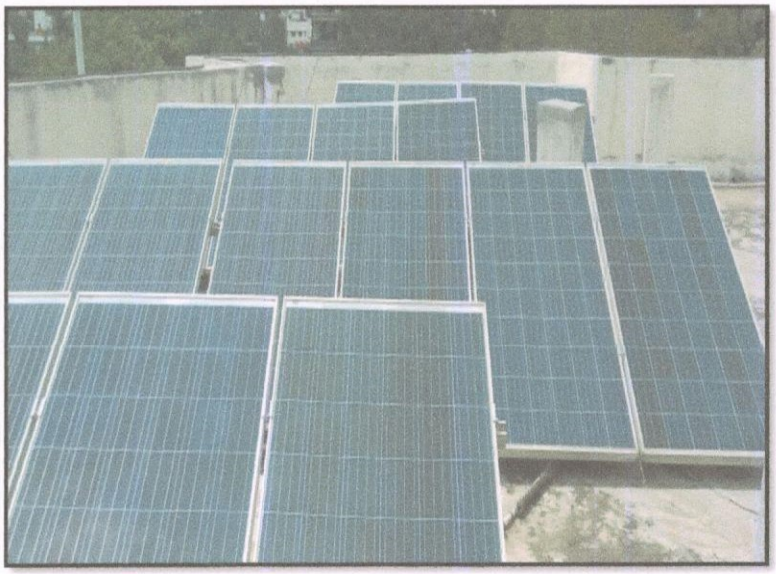
Photograph of Roof Top Solar PV Plant:



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STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project, wherein the Rain Water from terrace is collected and is used to recharge the bore well

Photograph of Bore well recharge Point:

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STUDY OF GREEN PRACTICES

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

Photograph of internal road in the campus:

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ECN/2018-19/CR-05/4174

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(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/DSTSCOP/19-20/02 Date: 13/7/2020

CERTIFICATE

This is to certify that we have conducted Green Audit at Dakshin Solapur Taluka Shikshan Mandal's, College of Pharmacy, Solapur in the Year 2019-20.

The College has adopted following Energy Efficient and Green Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 10 kWp
- Segregation of Waste at Source
- Vermi Composting Bed for Conversion of Organic Waste
- Provision of Sanitary Waste Incinerator, for disposal of Sanitary Waste
- Installation of Rain Water Management Project
- Good Internal Road
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan

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,

ENRICH CONSULTANTS * PUNE *

A Y Mehendale,
Certified Energy Auditor,
EA-8192

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dakshin Solapur Taluka Shikshan Mandal's, College of Pharmacy, Solapur for awarding us the assignment of Green Audit of their Solapur Campus, for the Academic Year: 2019-20.

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

EXECUTIVE SUMMARY

1. Dakshin Solapur Taluka Shikshan Mandal's, College of Pharmacy, Solapur consumes Energy in the form of **Electrical Energy and LPG;** used for various gadgets, office & other facilities

2. Present Energy Consumption & CO_2 Emission:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Total	13159	266	12.56
2	Maximum	1849	57	1.72
3	Minimum	258	9	0.26
4	Average	1096.58	22.17	1.05

3. Energy Conservation Measures adopted:

- Usage of Energy Efficient LED fittings
- Installation of 10 kWp Roof Top Solar PV Plant

4. Usage of Renewable Energy & CO_2 Emission Reduction:

- The College has yet to install Roof Top Solar PV Plant of Capacity **10 kWp**
- Energy generated by Solar PV Plant in 19-20 is **12000 kWh**
- Annual Reduction in CO2 Emissions in 19-20 is **10.8 MT.**

5. Waste Management:

5.1 Segregation of Waste at Source:

The solid waste is segregated at source. Waste Bins are located at various locations.

5.2 Organic Waste Management:

A Vermi Composting Bed is used to convert the Organic waste into Bio compost.

5.3 Sanitary Waste Management:

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

5.4 Bio Medical Waste Management:

No Bio medical Waste is generated in the College.

5.5 E Waste Management:

The E Waste is disposed of through M/s. Mahalaxmi e Recyclers Pvt. Ltd.

6. Rain Water Management:

The College has installed Rain Water Management Project, wherein the Rain Water from terrace is collected and is used to recharge the bore well.

7. Green & Sustainable Practices:

- Maintenance of good Internal Road
- Internal Tree Plantation
- Provision of Ramp for Divyangajan

8. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2into atmosphere
2. **1 Kg** of LPG releases **2.68 Kg of CO_2** into atmosphere
3. **1 kWp** of Solar PV Plant generates **4 kWh** of Energy per Day
4. Annual Solar Energy generation Days: **300 Nos**

9. References:

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

ABBREVIATIONS

DSTS	Dakshin Solapur Taluka Shikshan
kWh	Kilo Watt Hour
kWp	Kilo Watt Peak
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
LPG	Liquefied Petroleum Gas

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No 1: General Details of the College:

No	Head	Particulars
1	Name of College	Solapur Taluka Shikshan Mandal's College of Pharmacy, Solapur
2	Address	Jule Solapur-1, Vijapur Road, Solapur 413 004
3	Affiliation	Punyashlok Ahilyadevi Holkar University, Solapur

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Study of Electrical Energy & LPG Consumption: 19-20:

No	Month	Energy Purchased, kWh	LPG Consumption, Kg
1	Apr-19	1687	19
2	May-19	1619	19
3	Jun-19	852	11
4	Jul-19	258	9
5	Aug-19	1191	9
6	Sep-19	1322	57
7	Oct-19	1849	19
8	Nov-19	959	19
9	Dec-19	934	19
10	Jan-20	582	38
11	Feb-20	1099	38
12	Mar-20	807	9
13	Total	13159	266
14	Maximum	1849	57
15	Minimum	258	9
16	Average	1096.58	22.17

Chart No: 1: Study of variation of Monthly Electrical Energy Consumption:

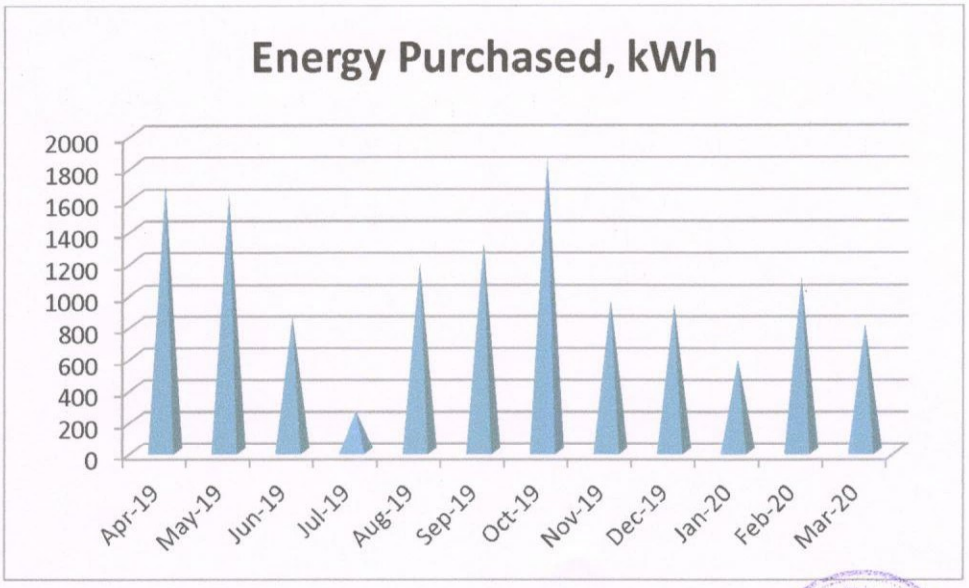

Chart No 2: Study of Month wise LPG Consumption:

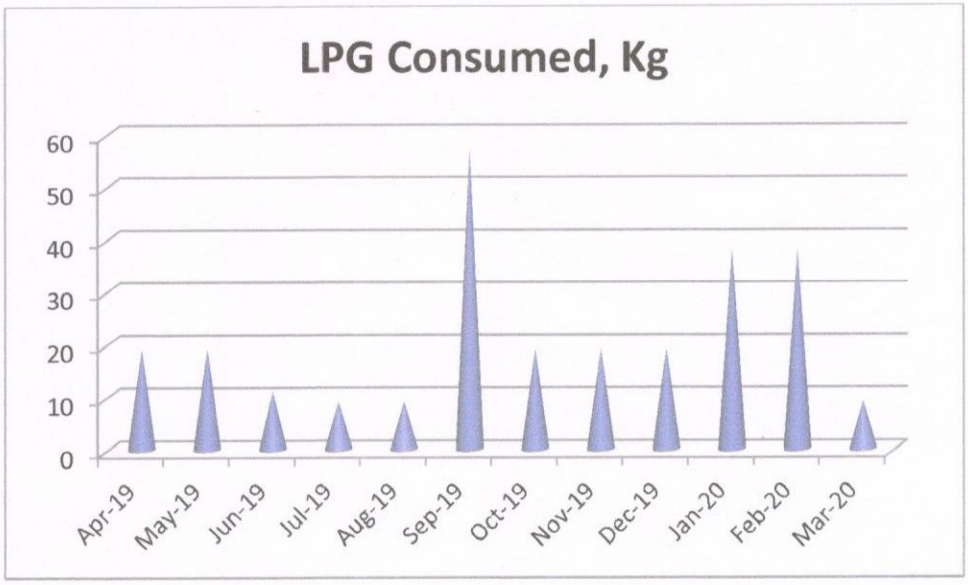

Table No 3: Variation in Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	13159	266
2	Maximum	1849	57
3	Minimum	258	9
4	Average	1096.58	22.17

CHAPTER-III
STUDY OF 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 College for performing its day to day activities

The College uses two forms of Energy namely: Electrical Energy for various Electrical gadgets and LPG.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to LPG & Electrical Energy are as under

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere
- **1 Kg of LPG** releases **2.68 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	LPG Consumption, Kg	CO_2 Emissions, MT
1	Apr-19	1687	19	1.57
2	May-19	1619	19	1.51
3	Jun-19	852	11	0.80
4	Jul-19	258	9	0.26
5	Aug-19	1191	9	1.10
6	Sep-19	1322	57	1.34
7	Oct-19	1849	19	1.72
8	Nov-19	959	19	0.91
9	Dec-19	934	19	0.89
10	Jan-20	582	38	0.63
11	Feb-20	1099	38	1.09
12	Mar-20	807	9	0.75
13	Total	13159	266	12.56
14	Maximum	1849	57	1.72
15	Minimum	258	9	0.26
16	Average	1096.58	22.17	1.05

Chart No: 3: Representation of Month wise CO_2 Emissions:

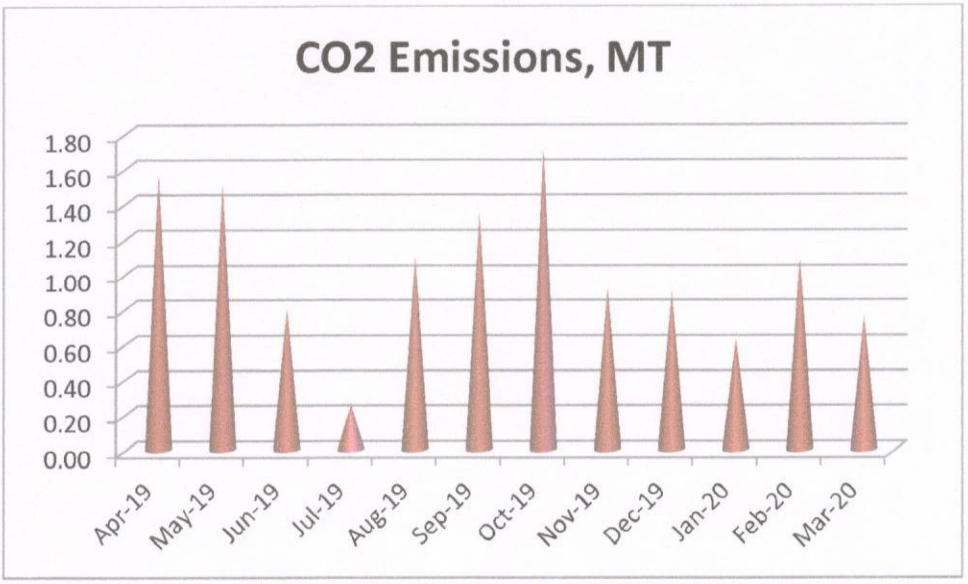

Table No 5: Variation in Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Total	13159	266	12.56
2	Maximum	1849	57	1.72
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CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

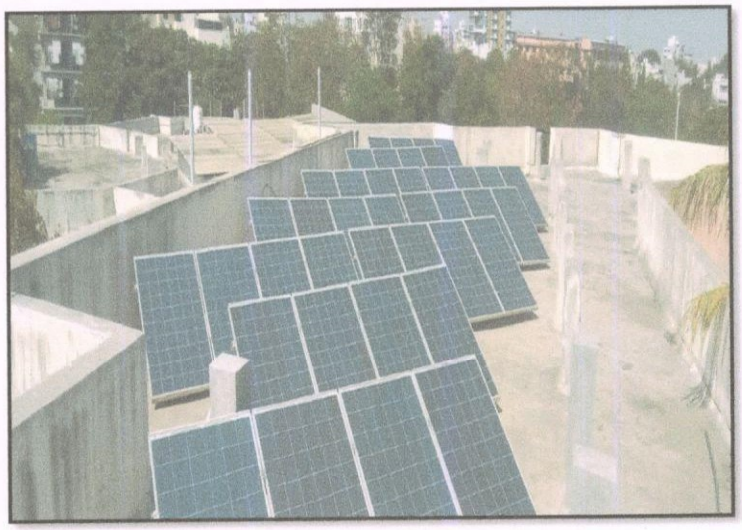
The Institute has installed a Roof Top Solar PV Plant of capacity **10 kWp.**

In the following Table we present the Annual Reduction in CO_2 Emissions due to Solar PV Plant.

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

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	10	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**12000**	kWh
5	1 kWh of Electrical Energy emits	**0.9**	Kg of CO_2
6	Annual Reduction in CO2 Emissions = (4) * (5) /1000	**10.8**	MT

Photograph of Roof Top Solar PV Plant:



CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The solid waste is segregated at source. Waste Bins are kept at various points.

Photograph of Waste Collection Bin:

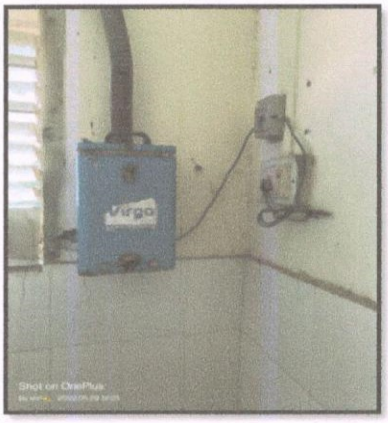
5.2 Organic Waste Management:

A Vermi composting Bed is used to convert the Organic waste into Bio compost.

5.3 Sanitary Waste Management:

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

Photograph of Sanitary Waste Incinerator:



5.4 Bio Medical Waste Management:

No Bio medical Waste is generated in the College.

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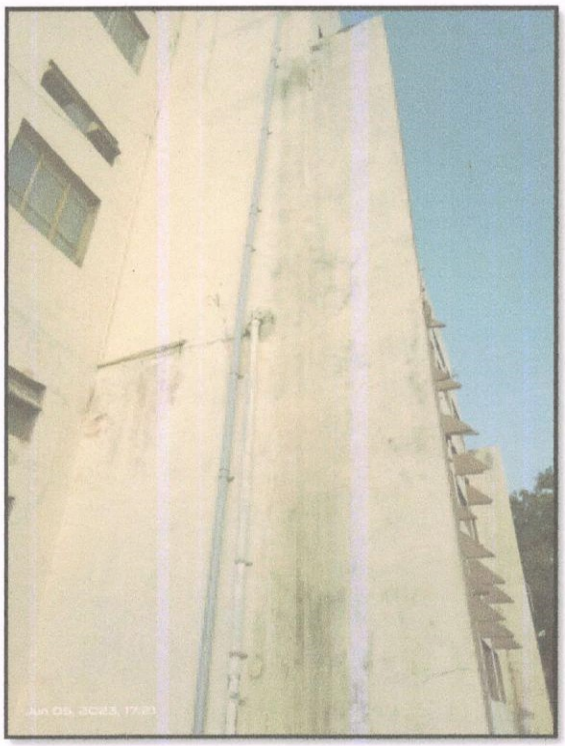
The E Waste is disposed of through M/s. Mahalaxmi e Recyclers Pvt. Ltd.

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project, wherein the Rain Water from terrace is collected and is used to recharge the bore well.

Photograph of Rain Water Collecting Pipe:



CHAPTER-VII
STUDY OF GREEN AND SUSTAINABLEPRACTICES

7.1 Pedestrian Friendly Road:

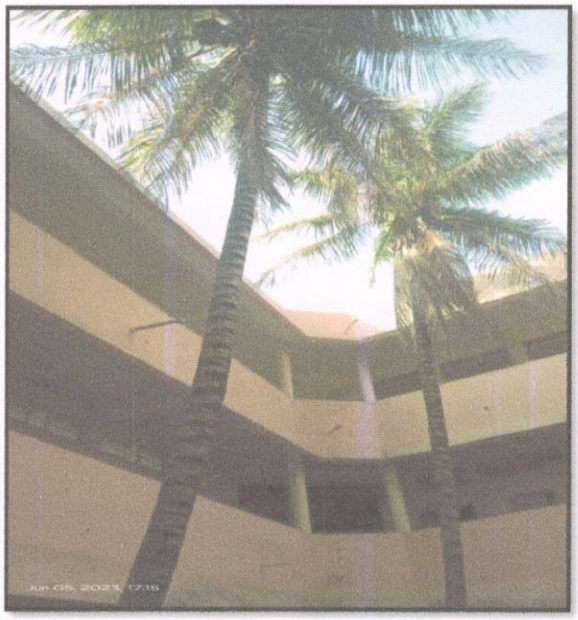
The College has well maintained internal road to facilitate the easy movement of the students within the campus and also

Photograph of internal road in the campus:

7.2 Internal Tree Plantation:

The College has well maintained Tree Plantation & Medicinal Plant Garden.

Photograph of Internal Tree Plantation:



7.3 Provision of Ramp for Divyangajan:

The College has made provision for Ramp for easy movement of Divyangajan. Also dedicated wash rooms are made available.

Photograph of Ramp:

GREEN AUDIT REPORT

of

Dakshin Solapur Taluka Shikshan Mandal's,

COLLEGE OF PHARMACY, SOLAPUR

Jule Solapur-1, Vijapur Road, Solapur

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 PUNE

Enrich Consultants

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No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
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2	Maximum	807	38	0.75
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4	Average	363.58	11.08	0.36

3. Energy Conservation Measures adopted:

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

- The College has yet to install Roof Top Solar PV Plant of Capacity **10 kWp**
- Energy generated by Solar PV Plant in 20-21 is **12000 kWh**
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1.1 Objectives:

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2. To compute CO_2 emissions
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In this chapter, we present the analysis of Energy Consumption.

Table No 2: Study of Electrical Energy & LPG Consumption: 20-21:

No	Month	Energy Purchased, kWh	LPG Consumption, Kg
1	Apr-20	807	9
2	May-20	81	0
3	Jun-20	81	0
4	Jul-20	288	9
5	Aug-20	261	19
6	Sep-20	282	38
7	Oct-20	468	19
8	Nov-20	336	9
9	Dec-20	180	9
10	Jan-21	494	6
11	Feb-21	512	9
12	Mar-21	573	6
13	Total	4363	133
14	Maximum	807	38
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16	Average	363.58	11.08

Chart No: 1: Study of variation of Monthly Electrical Energy Consumption:

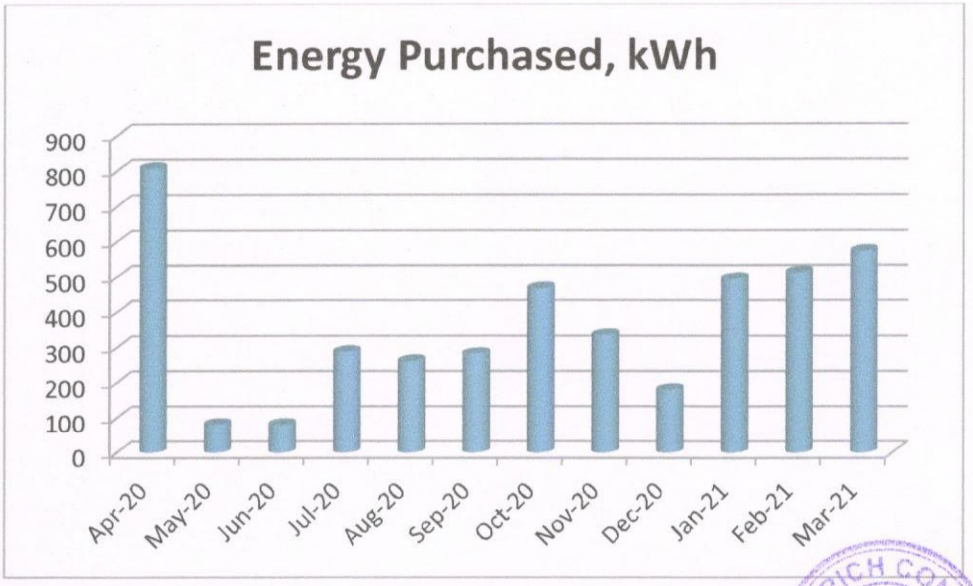

Chart No 2: Study of Month wise LPG Consumption:

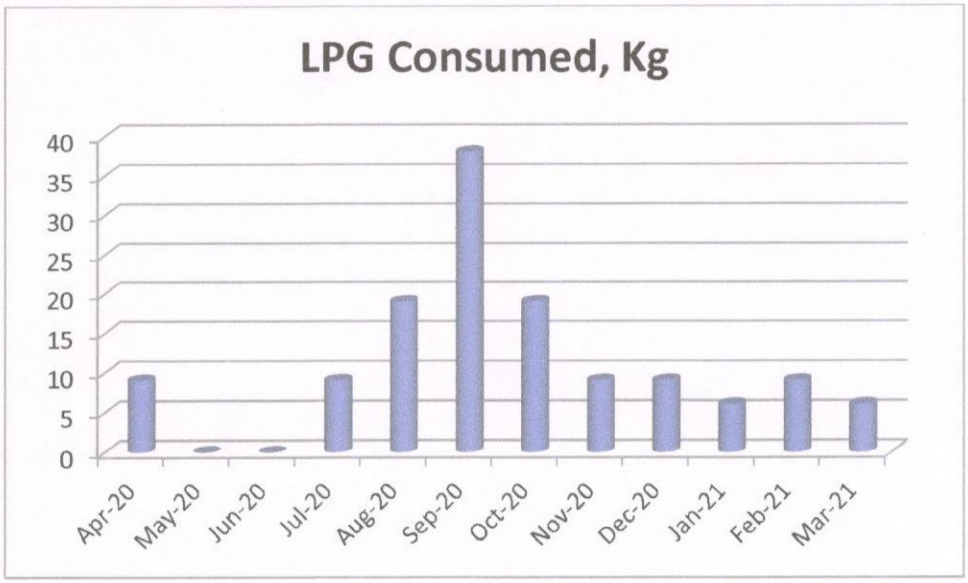

Table No 3: Variation in Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh	LPG Consumed, Kg
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3	Minimum	81	0
4	Average	363.58	11.08

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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 two forms of Energy namely: Electrical Energy for various Electrical gadgets and LPG.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to LPG & Electrical Energy are as under

- **1 kWh** of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere
- **1 Kg of LPG** releases **2.68 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	LPG Consumption, Kg	CO_2 Emissions, MT
1	Apr-20	807	9	0.75
2	May-20	81	0	0.07
3	Jun-20	81	0	0.07
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5	Aug-20	261	19	0.29
6	Sep-20	282	38	0.36
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8	Nov-20	336	9	0.33
9	Dec-20	180	9	0.19
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13	Total	4363	133	4.28
14	Maximum	807	38	0.75
15	Minimum	81	0	0.07
16	Average	363.58	11.08	0.36

Chart No: 3: Representation of Month wise CO_2 Emissions:

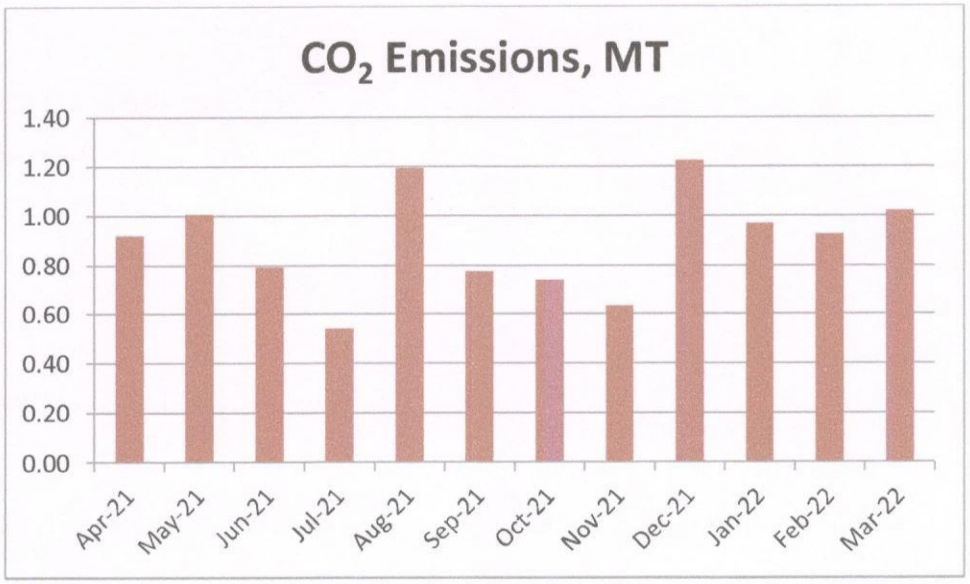

Table No 5: Variation in Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Total	4363	133	4.28
2	Maximum	807	38	0.75
3	Minimum	81	0	0.07
4	Average	363.58	11.08	0.36

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed a Roof Top Solar PV Plant of capacity **10 kWp.**

In the following Table we present the Annual Reduction in CO_2 Emissions due to Solar PV Plant.

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

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	10	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**12000**	kWh
5	1 kWh of Electrical Energy emits	**0.9**	Kg of CO_2
6	Annual Reduction in CO2 Emissions = (4) * (5) /1000	**10.8**	MT

Photograph of Roof Top Solar PV Plant:

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The solid waste is segregated at source. There are separate bins for collection of Waste at various points.

Photograph of Waste Collection Bin:

5.2 Organic Waste Management:

A Vermi composting Bed is used to convert the Organic waste into Bio compost.

Photograph of Bio Composting Pit:

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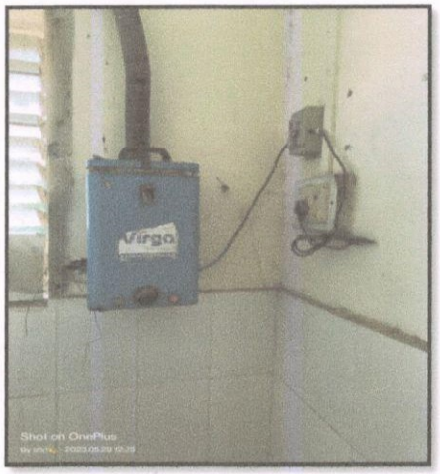

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No Bio medical Waste is generated in the College.

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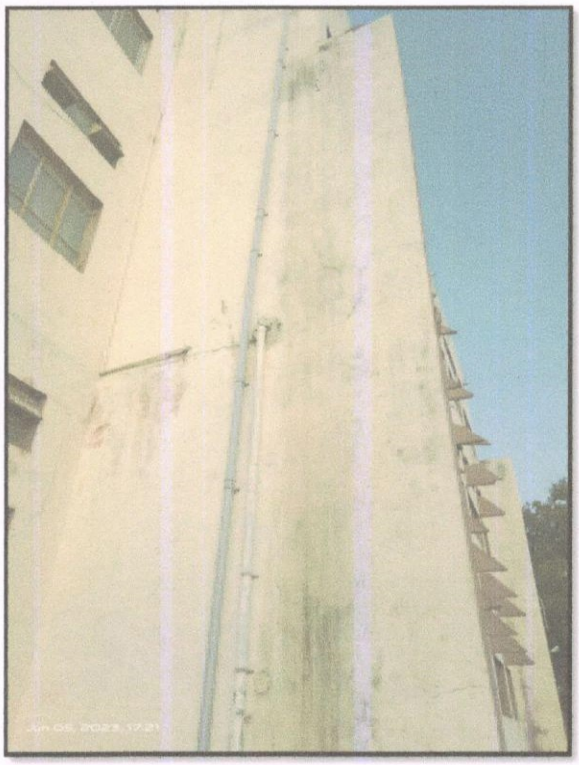
The E Waste is disposed of through M/s. Mahalaxmi e Recyclers Pvt. Ltd.

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project, wherein the Rain Water from terrace is collected and is used to recharge the bore well.

Photograph of Underground Rain Water Carrying Pipe:

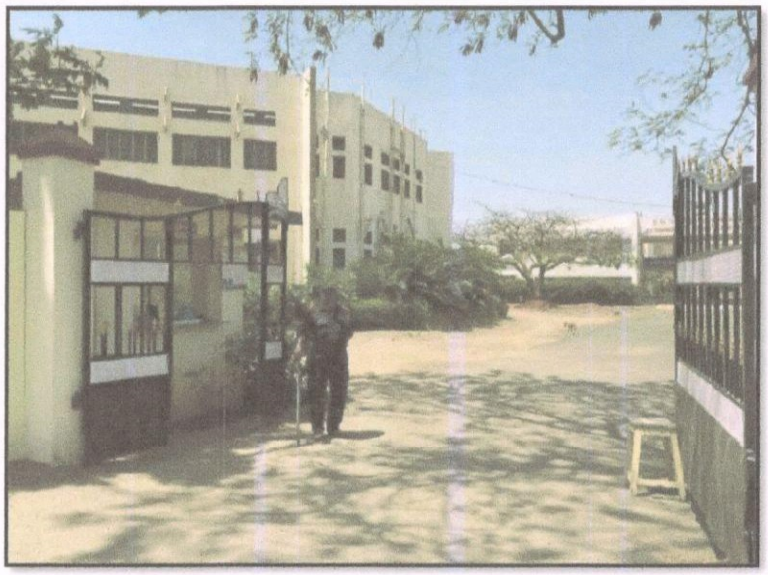


CHAPTER-VII
STUDY OF GREEN AND SUSTAINABLEPRACTICES

7.1 Pedestrian Friendly Road:

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

Photograph of internal road in the campus:



7.2 Internal Tree Plantation:

The College has well maintained Tree Plantation & Medicinal Plant Garden.

Photograph of Internal Tree Plantation:

7.3 Provision of Ramp for Divyangajan:

The College has made provision for Ramp for easy movement of Divyangajan. Also dedicated wash rooms are made available.

Photograph of Ramp:

GREEN AUDIT REPORT

of

Dakshin Solapur Taluka Shikshan Mandal's,

COLLEGE OF PHARMACY, SOLAPUR

Jule Solapur-1, Vijapur Road, Solapur

Year: 2021-22

Prepared by:

ENGRESS SERVICES

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

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary, Aundh, Pune, Maharashtra 411067
Ph No: 020-35000450
Email: 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
Ideate Innovate Impact

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/DSTSCOP/21-22/02 Date: 12/6/2022

CERTIFICATE

This is to certify that we have conducted Green Audit at Dakshin Solapur Taluka Shikshan Mandal's, College of Pharmacy, Solapur in the Year 2021-22.

The College has adopted following Energy Efficient and Green Practices:

- Usage of Energy Efficient LED Fittings
- Installation of Roof Top Solar PV Plant of Capacity 10 kWp
- Segregation of Waste at Source
- Vermi Composting Pit Arrangement for Conversion of Organic Waste
- Provision of Sanitary Waste Incinerator, for disposal of Sanitary Waste
- Installation of Rain Water Management Project
- Good Internal Road
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of Awareness on Energy Conservation by Display of Posters.

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus 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 at Engress Services, Pune, express our sincere gratitude to the management of Dakshin Solapur Taluka Shikshan Mandal's, College of Pharmacy, Solapur for awarding us the assignment of Green Audit of their Solapur Campus, for the Academic Year: 2021-22.

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

EXECUTIVE SUMMARY

1. Dakshin Solapur Taluka Shikshan Mandal's, College of Pharmacy, Solapur consumes Energy in the form of **Electrical Energy and LPG** used for various gadgets, office & other facilities.

2. Present Energy Consumption & CO_2 Emission:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Total	2904	266	3.33
2	Maximum	745	57	0.72
3	Minimum	0	9	0.02
4	Average	242.00	22.17	0.28

3. Energy Conservation Measures adopted:

- Usage of Energy Efficient LED fittings
- Installation of 10 kWp Roof Top Solar PV Plant

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

- The College has yet to install Roof Top Solar PV Plant of Capacity **10 kWp**
- Energy generated by Solar PV Plant in 21-22 is **12000 kWh**
- Annual Reduction in CO2 Emissions in 21-22 is **10.8 MT.**

5. Waste Management:

5.1 Segregation of Waste at Source:

The solid waste is segregated at source. Waste Bins are located at various locations.

5.2 Organic Waste Management:

Vermi Composting Pit Arrangement is used to convert the Organic waste into Bio compost.

5.3 Sanitary Waste Management:

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

5.4 Bio Medical Waste Management:

No Bio medical Waste is generated in the College.

5.5 Chemical Laboratory Liquid Waste Management:

The Chemical Laboratory Liquid Waste is first diluted with Salt solution & then drained into the municipal drainage line.

5.6 Chemicals' Storage & Fumes' Management:

Hazardous chemicals are kept away from the reach of students in the fumigation Chamber.

5.7 E Waste Management:

The E Waste is disposed of through M/s. Mahalaxmi e Recyclers Pvt. Ltd.

6. Rain Water Management:

The College has installed Rain Water Management Project, wherein the Rain Water from terrace is collected and is used to recharge the bore well.

7. Green & Sustainable Practices:

- Maintenance of good Internal Road
- Internal Tree Plantation
- Provision of Ramp for Divyangajan
- Creation of Awareness on Energy Conservation, by Display of Posters

8. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO_2 into atmosphere
2. **1 Kg** of LPG releases **2.68 Kg of** CO_2 into atmosphere
3. **1 kWp** of Solar PV Plant generates **4 kWh** of Energy per Day
4. Annual Solar Energy generation Days: **300 Nos**

9. References:

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

ABBREVIATIONS

DSTS	Dakshin Solapur Taluka Shikshan
kWh	Kilo Watt Hour
kWp	Kilo Watt Peak
Kg	Kilo Gram
MT	Metric Ton
CO_2	Carbon Di Oxide
LPG	Liquefied Petroleum Gas

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No 1: General Details of the College:

No	Head	Particulars
1	Name of College	Solapur Taluka Shikshan Mandal's College of Pharmacy, Solapur
2	Address	Jule Solapur-1, Vijapur Road, Solapur 413 004
3	Affiliation	Punyashlok Ahilyadevi Holkar University, Solapur

1.3 Google Earth Image:

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Study of Electrical Energy & LPG Consumption: 21-22:

No	Month	Energy Purchased, kWh	LPG Consumption, Kg
1	Apr-21	384	10
2	May-21	0	9
3	Jun-21	0	9
4	Jul-21	0	19
5	Aug-21	0	38
6	Sep-21	0	38
7	Oct-21	0	57
8	Nov-21	233	19
9	Dec-21	745	19
10	Jan-22	584	19
11	Feb-22	418	10
12	Mar-22	540	19
13	Total	2904	266
14	Maximum	745	57
15	Minimum	0	9
16	Average	242.00	22.17

Chart No: 1: Study of variation of Monthly Electrical Energy Consumption:

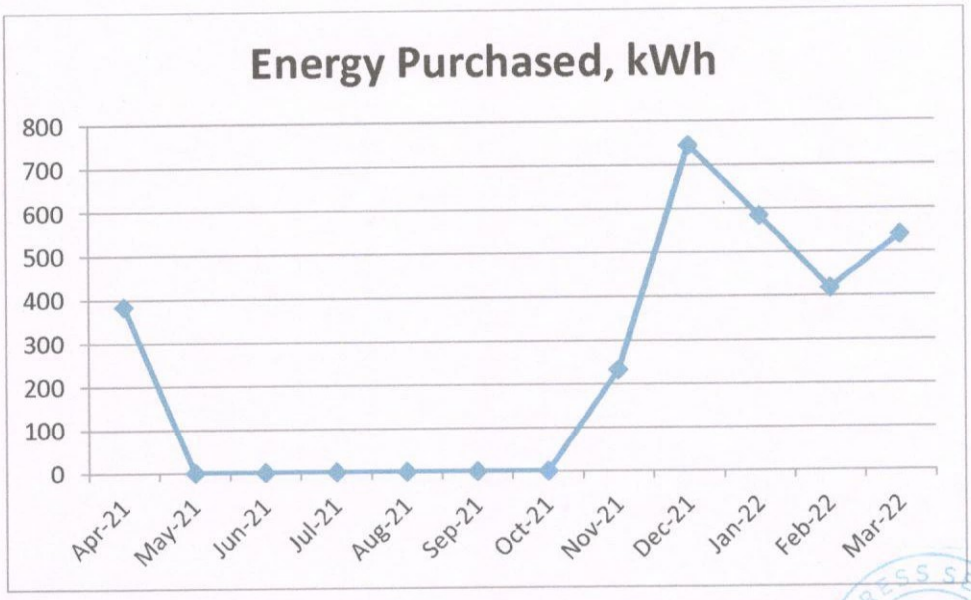


Chart No 2: Study of Month wise LPG Consumption:

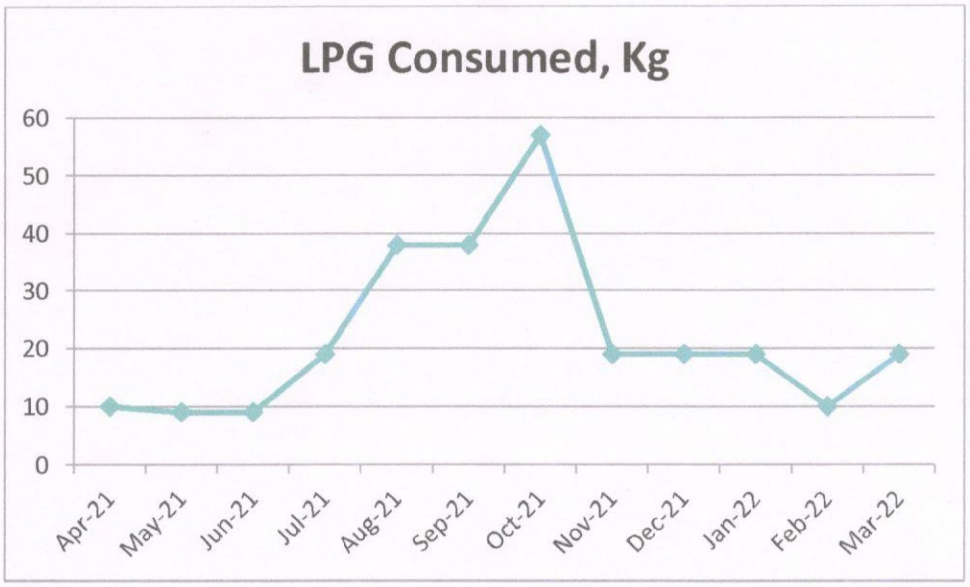


Table No 3: Variation in Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	2904	266
2	Maximum	745	57
3	Minimum	0	9
4	Average	242.00	22.17

CHAPTER-III
STUDY OF 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 College for performing its day to day activities

The College uses two forms of Energy namely: Electrical Energy for various Electrical gadgets and LPG.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to LPG & Electrical Energy are as under

- **1 kWh** of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere
- **1 Kg of LPG** releases **2.68 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	LPG Consumption, Kg	CO_2 Emissions, MT
1	Apr-21	384	10	0.37
2	May-21	0	9	0.02
3	Jun-21	0	9	0.02
4	Jul-21	0	19	0.05
5	Aug-21	0	38	0.10
6	Sep-21	0	38	0.10
7	Oct-21	0	57	0.15
8	Nov-21	233	19	0.26
9	Dec-21	745	19	0.72
10	Jan-22	584	19	0.58
11	Feb-22	418	10	0.40
12	Mar-22	540	19	0.54
13	Total	2904	266	3.33
14	Maximum	745	57	0.72
15	Minimum	0	9	0.02
16	Average	242.00	22.17	0.28

Chart No: 3: Representation of Month wise CO_2 Emissions:

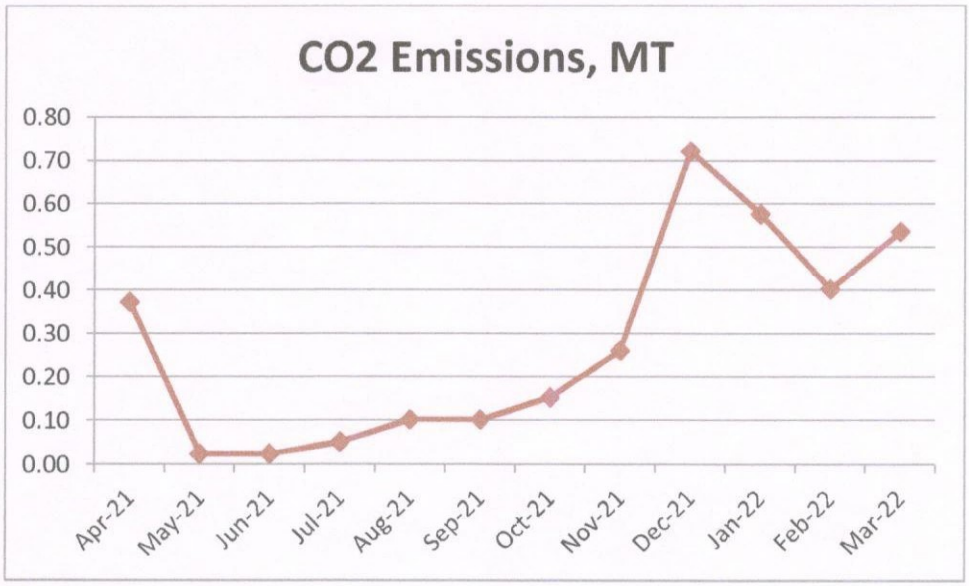


Table No 5: Variation in Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Total	2904	266	3.33
2	Maximum	745	57	0.72
3	Minimum	0	9	0.02
4	Average	242.00	22.17	0.28

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed a Roof Top Solar PV Plant of capacity **10 kWp.**

In the following Table we present the Annual Reduction in CO_2 Emissions due to Solar PV Plant.

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

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	10	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**12000**	kWh
5	1 kWh of Electrical Energy emits	**0.9**	Kg of CO_2
6	Annual Reduction in CO2 Emissions = (4) * (5) /1000	**10.8**	MT

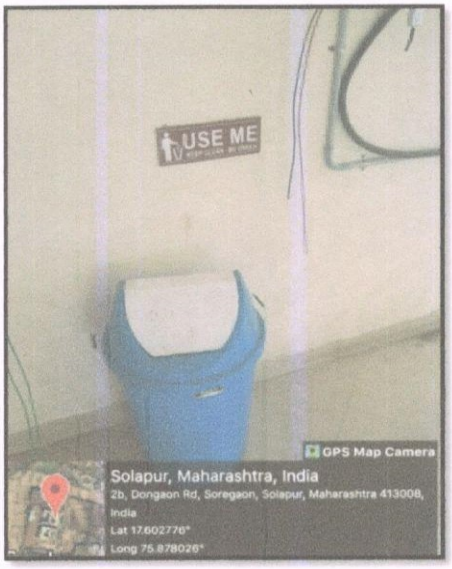
Photograph of Roof Top Solar PV Plant:

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The solid waste is segregated at source. There are separate bins for collection of Waste at various points.

Photograph of Waste Collection Bin:



5.2 Organic Waste Management:

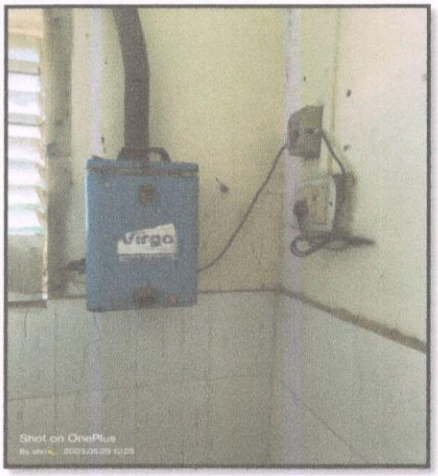
A Vermi composting Bed is used to convert the Organic waste into Bio compost.

Photograph of Bio Composting Pit:

5.3 Sanitary Waste Management:

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

Photograph of Sanitary Waste Incinerator:



5.4 Bio Medical Waste Management:

No Bio medical Waste is generated in the College.

5.5 Chemical Laboratory Liquid Waste Management:

The Chemical Laboratory Liquid Waste is first diluted with Salt solution & then drained into the municipal drainage line.

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Hazardous chemicals are kept away from the reach of students in the fumigation Chamber.

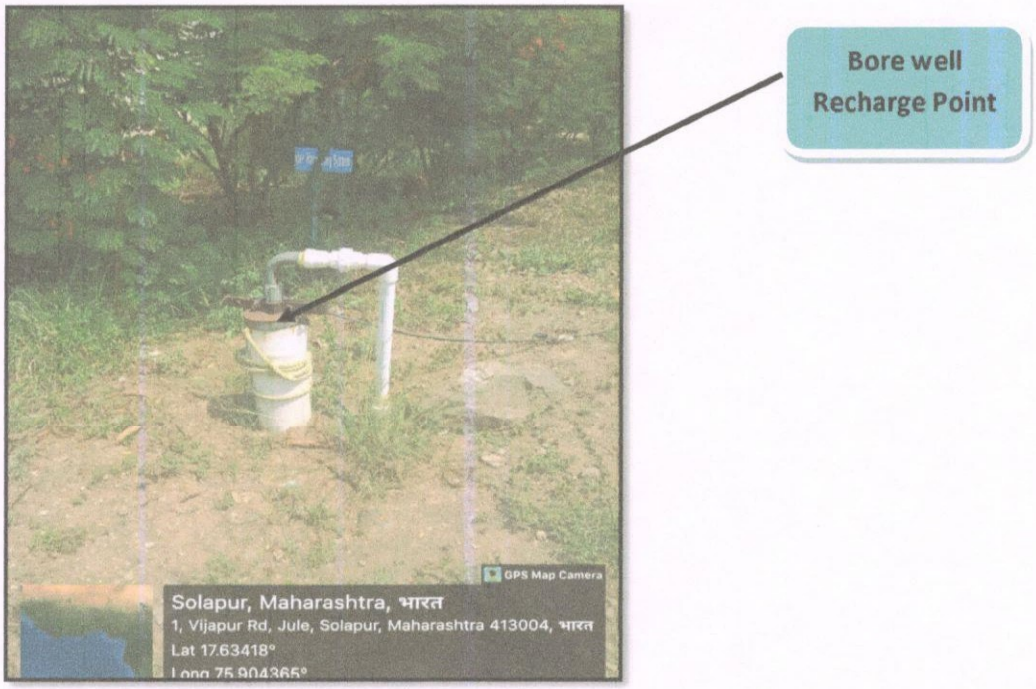
5.7 E Waste Management:

The E Waste is disposed of through M/s. Mahalaxmi e Recyclers Pvt. Ltd.

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project, wherein the Rain Water from terrace is collected and is used to recharge the bore well.

Photograph of Bore well Recharge Point:

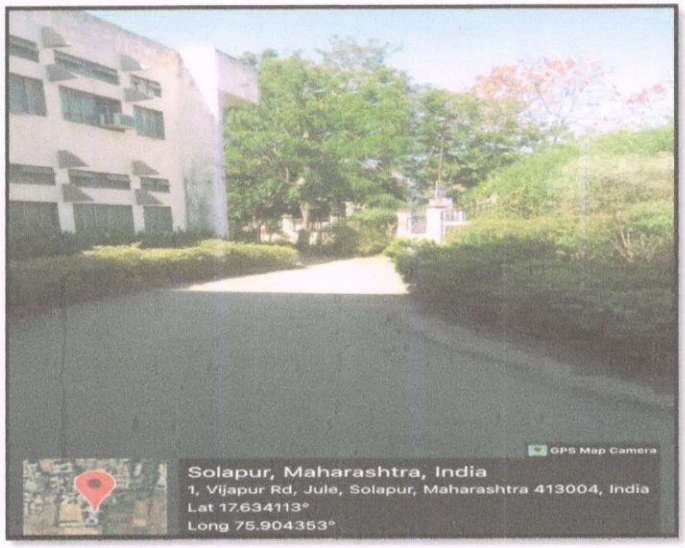


CHAPTER-VII
STUDY OF GREEN AND SUSTAINABLEPRACTICES

7.1 Pedestrian Friendly Road:

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

Photograph of internal road in the campus:



7.2 Internal Tree Plantation:

The College has well maintained Tree Plantation & Medicinal Plant Garden.

Photograph of Internal Tree Plantation:

7.3 Provision of Ramp for Divyangajan:

The College has made provision for Ramp for easy movement of Divyangajan. Also dedicated wash rooms are made available.

Photograph of Ramp:

7.4 Creation of Awareness on Energy Conservation:

The College has displayed Poster emphasizing on Energy Conservation.

Photograph of Poster on Energy Conservation: