Dr. D. Y. Patil Pratishthan's
Dr. D. Y. PATIL COLLEGE OF PHARMACY
Dr. D. Y. Patil Educational Complex, Sector - 29, Pradhikaran, Akurdi, Pune 411 044.
Tel. : 020-27656141, Tel. Fax : 020-27656141
E-mail : info@dyppharmaakurdi.ac.in Web : www.dyppharmaakurdi.ac.in
Approved by : All India Council for Techinical Education, New Delhi
Pharmacy Council of India, New Delhi. Recognized by : Government of Maharashtra
Affiliated to Savitribai Phule Pune University, Pune

Dr. Sanjay D. Patil
President

Padmashree Dr. D. Y. Patil
Founder

Shri. Satej D. Patil
Vce-President & Chairman

Dr. N. S. Vyawahare
Principal

Ref. No. : DYPCOP/
Date :

7.1.3: Green audit/environmental audit report from recognized bodies

Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy ★ Akurdi, Pune - 44.

Dr. D. Y. Patil Pratishthan's
Dr. D. Y. PATIL COLLEGE OF PHARMACY
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Vce-President & Chairman

Dr. N. S. Vyawahare
Principal

Ref. No. : DYPCOP/
Date :

7.1.3: Green audit/ environmental audit report from recognized bodies

Preamble

As a part of Green Campus/ Plastic Free campus policy various audits were done by third party agency named Engress Services, Pune (Previously it was Enrich Consultants up to year 2021).
As a regular practice all audits are done annually considering the academic year from June to May.
Following are the reports of the audits done annually.

Sr. No	Name of the Document	Year
1	Energy Audit	2021-22
2	Green Audit	
3	Environment Audit	
4	Energy Audit	2020-21
5	Green Audit	
6	Environment Audit	
7	Energy Audit	2019-20
8	Green Audit	
9	Environment Audit	
10	Energy Audit	2018-19
11	Green Audit	
12	Energy Audit	2017-18
13	Green Audit	

Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy Akurdi, Pune - 44.

Dr N S Vyawahare
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Dr. D. Y. Patil Pratishthan's
Dr. D. Y. PATIL COLLEGE OF PHARMACY
Dr. D. Y. Patil Educational Complex, Sector - 29, Pradhikaran, Akurdi, Pune 411 044.
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Vce-President & Chairman

Dr. N. S. Vyawahare
Principal

Ref. No. : DYPCOP/
Date :

Summary of the reports submitted by the auditing agency

As a regular practice all audits are done annually considering the academic year from June to May.

Following are the reports of the audits done annually.

Sr. No	Name of the Document
1	Energy Audit 2021-22
2	Green Audit 2021-22
3	Environment Audit 2021-22
4	Energy Audit 2020-21
5	Green Audit 2020-21
6	Environment Audit 2020-21
7	Energy Audit 2019-20
8	Green Audit 2019-20
9	Environment Audit 2019-20
10	Energy Audit 2018-19
11	Green Audit 2018-19
12	Energy Audit 2017-18
13	Green Audit 2017-18

Dr N S Vyawahare

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Dr. D. Y. Patil Pratishthan's
Dr. D. Y. PATIL COLLEGE OF PHARMACY
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Founder

Shri. Satej D. Patil
Vce-President & Chairman

Dr. N. S. Vyawahare
Principal

Ref. No. : DYPCOP/
Date :

Clarification given by Engress Services Pune.

ENGRESS SERVICES

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

Ref: ES/23-24/02
Date: 6/6/2023

To
The Principal,
Dr D Y Patil College of Pharmacy
Pradhikaran, Nigdi, Pune

Subject: Clarification in respect of Company Names: Enrich Consultants & Engress Services.

Respected Sir,

This is to inform you that, till the Year: 2020-21, our old company's name was Enrich Consultants, which was in operation from: April-2010 to March-2021.

In April-2021, we started the new organization, in the name of Engress Services.

Both the organizations are empanelled with Maharashtra Energy Development Agency.

Hence, the Audit Reports submitted by us Till Year: 20-21 are in the name of Enrich Consultants.

While Reports of Years: 21-22 & 22-23 are in the name of Engress Services.

The Invoicing is in the name of Engress Services.

For your kind information.

Thanking you,

Yours Faithfully,

For Engress Services,

Authorized Signatory

ENGRESS SERVICES PUNE

Dr N S Vyawahare
Digitally signed by Dr N S Vyawahare
Date: 2023.06.15 11:19:13 +05'30'

Dr. D. Y. Patil Pratishthan's
Dr. D. Y. PATIL COLLEGE OF PHARMACY
Dr. D. Y. Patil Educational Complex, Sector - 29, Pradhikaran, Akurdi, Pune 411 044.
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Dr. N. S. Vyawahare
Principal

Ref. No. : DYPCOP/
Date :

2021-22

Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy Akurdi, Pune - 44.

Dr N S Vyawahare
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ENERGY AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

Year: 2021-22

Prepared by

ENGRESS SERVICES

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

ENGRESS SERVICES PUNE

Dr N S Vyawahare

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BACK TO SUMMARY

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

LCN/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)

Dr N S Vyawahare

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BACK TO SUMMARY

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/DYPCOP/21-22/01

Date: 12/6/2022

CERTIFICATE

This is to certify that we have conducted Energy Audit at Dr. D. Y. Patil Pratishthan's, Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2021-22.

The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 15.36 kWp Roof Top Solar PV Plant.

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

For Engress Services,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENGRESS SERVICES PUNE

Dr N S Vyawahare
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Dr N S Vyawahare

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ENGRESS SERVICES PUNE

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's Dr. D.Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Energy Audit of Akurdi campus for the Academic Year: 2022-23.

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

Dr N S Vyawahare

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BACK TO SUMMARY

ENGRESS SERVICES PUNE

EXECUTIVE SUMMARY

1. Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune consumes Energy in the form of Electrical Energy & LPG; used for various gadgets, Office & other facilities.

2. Present Energy, LPG Consumption & CO_2 Emissions:

No	Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 emissions, MT
1	Total	87227	114	78.81
2	Maximum	13654	19	12.34
3	Minimum	2185	3	1.97
4	Average	7268.92	9.5	6.57

3. Various Measures Adopted for Energy Conservation:

- Usage of Energy efficient LED fittings
- Usage of BEE STAR Rated Equipment
- Installation of 15.36 kWp Roof Top Solar PV Plant

4. Usage of Alternate / Renewable Energy:

- The College has installed 15.36 kWp Roof Top Solar PV Plant.
- The Energy purchased from MSEDCL in 2021-22 is 87227 kWh
- Energy generated by Solar PV Plant is 18432 kWh
- Total Annual Energy Demand of the College is 105659 kWh
- The percentage of Alternate Energy to Annual Energy Demand is 17.44 %.

5. Usage of LED Lighting:

- The Total LED Lighting Load is 4.84 kW.
- The Total Lighting Load is 17.14 kW.
- The % of LEDs to Total Lighting Load is 28 %.

6. 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. Average Energy generated by 1 kWp Roof Top Solar PV System: 4 kWh
4. Annual Solar Energy Generation Days: 300 Nos

7. References:

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

Dr N S Vyawahare

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BACK TO SUMMARY

ABBREVIATIONS

AC	:	Air conditioner
LED	:	Light Emitting Diode
PL	:	Pin Type Light Fitting
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
D/L	:	Down Lighter
PC	:	Personal Computer
MT	:	Metric Ton

Dr N S Vyawahare

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BACK TO SUMMARY

ENGRESS SERVICES PUNE

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No1: General Details of College:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
2	Address	Dr. D. Y. Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	1999

1.3 Google Earth Image:

Dr N S Vyawahare
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Date: 2023.06.15 11:22:36 +05'30'

BACK TO SUMMARY

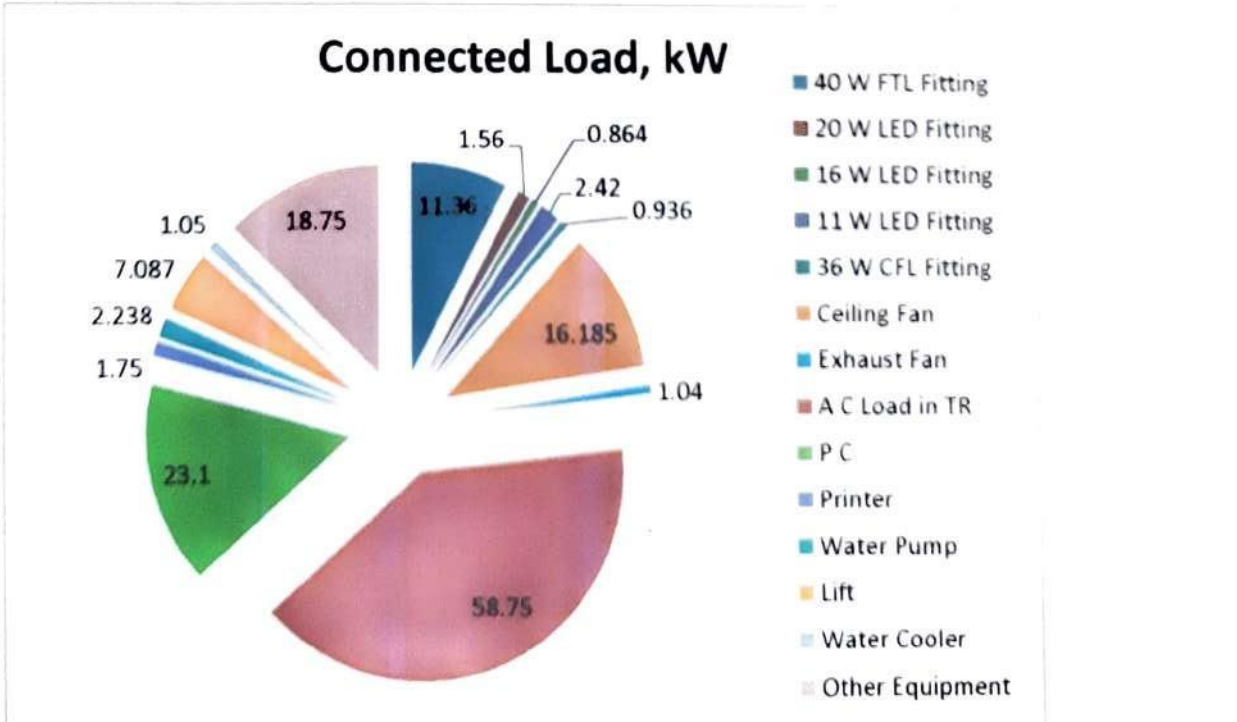
CHAPTER-II
STUDY OF CONNECTED LOAD

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

Table No-2: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	40 W FTL Fitting	284	40	11.36
2	20 W LED Fitting	78	20	1.56
3	16 W LED Fitting	54	16	0.864
4	11 W LED Fitting	220	11	2.42
5	36 W CFL Fitting	26	36	0.936
6	Ceiling Fan	249	65	16.185
7	Exhaust Fan	20	52	1.04
8	A C Load in TR	47	1250	58.75
9	P C	154	150	23.1
10	Printer	10	175	1.75
11	Water Pump	1	2238	2.238
12	Lift	1	7087	7.087
13	Water Cooler	3	350	1.05
14	Other Equipment	125	150	18.75
15	**Total**			**147.1**

Chart No-1: Details of Connected Load:



BACK TO SUMMARY

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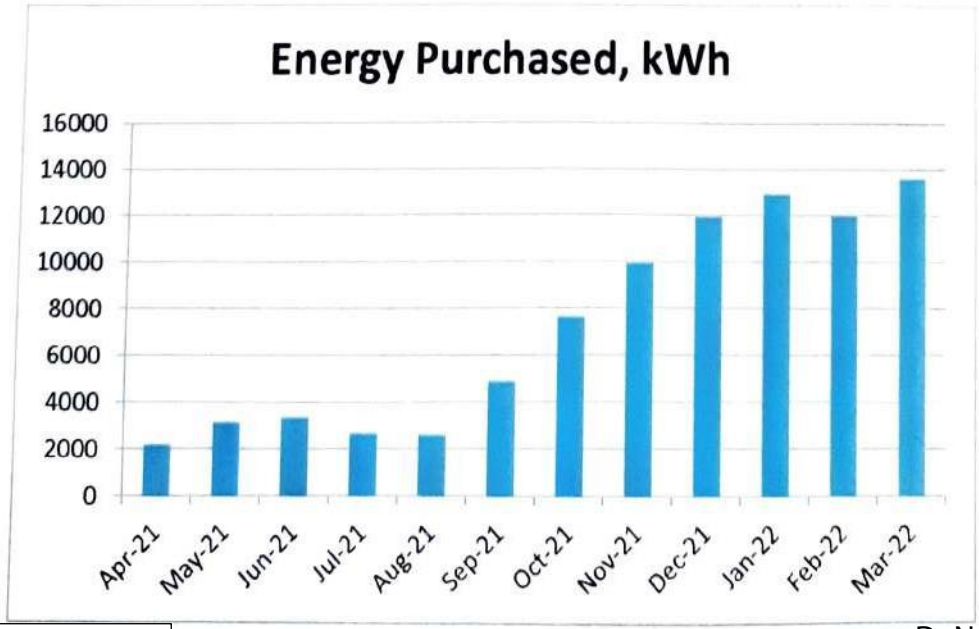
CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

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

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

No	Month	Energy Purchased, kWh	LPG Consumed, Kg
1	Apr-21	2185	3
2	May-21	3165	4
3	Jun-21	3385	4
4	Jul-21	2714	8
5	Aug-21	2652	9
6	Sep-21	4942	9
7	Oct-21	7695	9
8	Nov-21	9925	9
9	Dec-21	11936	10
10	Jan-22	12985	11
11	Feb-22	11989	19
12	Mar-22	13654	19
13	Total	87227	114
14	Maximum	13654	19
15	Minimum	2185	3
16	Average	7268.92	9.5

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



BACK TO SUMMARY

Dr N S Vyawahare

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Chart No 3: To study the variation of Month wise LPG Consumption, kWh:

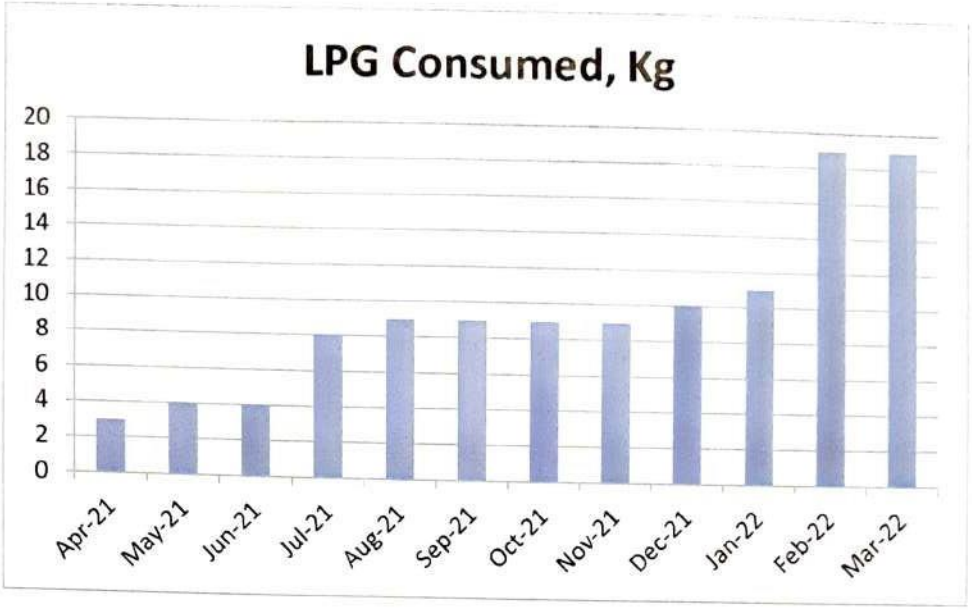

Table No 4: Key Parameters:

No	Parameter	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	87227	114
2	Maximum	13654	19
3	Minimum	2185	3
4	Average	7268.92	9.5

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ENGRESS SERVICES PUNE

CHAPTER-IV
STUDY OF CARBON FOOT PRINTING

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

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

The College uses Electrical Energy & LPG for various Electrical gadgets & in Labs.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is:

- **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 5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Apr-21	2185	3	1.97
2	May-21	3165	4	2.86
3	Jun-21	3385	4	3.06
4	Jul-21	2714	8	2.46
5	Aug-21	2652	9	2.41
6	Sep-21	4942	9	4.47
7	Oct-21	7695	9	6.95
8	Nov-21	9925	9	8.96
9	Dec-21	11936	10	10.77
10	Jan-22	12985	11	11.72
11	Feb-22	11989	19	10.84
12	Mar-22	13654	19	12.34
13	Total	87227	114	78.81
14	Maximum	13654	19	12.34
15	Minimum	2185	3	1.97
16	Average	7268.92	9.5	6.57

BACK TO SUMMARY

Dr N S Vyawahare

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Chart No 4: Representation of Month wise CO_2 emissions:

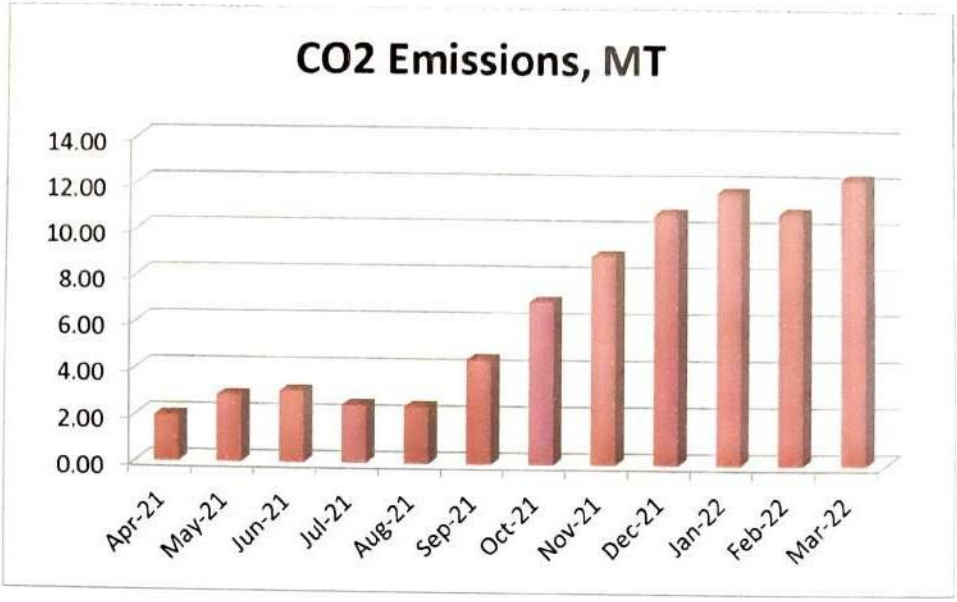

Table No 6: Key Parameters:

No	Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 emissions, MT
1	Total	87227	114	78.81
2	Maximum	13654	19	12.34
3	Minimum	2185	3	1.97
4	Average	7268.92	9.5	6.57

Dr N S Vyawahare

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ENGRESS SERVICES PUNE

BACK TO SUMMARY

CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

The College has installed **15.36 kWp** Roof Top Solar PV Plant.

In this Chapter, we compute the percentage of usage of Alternate / Renewable Energy to Annual Energy Demand of the College.

Table No 7: Computation of % usage of Alternate Energy to Annual Energy Demand:

No	Particulars	Value	Unit
1	Energy Purchased from MSEDCL	**87227**	kWh
2	Installed Roof Top Solar PV Plant Capacity	15.36	kWp
3	Average Daily Energy Generated	4	kWh/kWp
4	Annual Generation Days	300	Nos
5	Annual Solar Energy Generated	**18432**	kWh
6	Total Energy Demand = (1) + (5)	105659	kWh
7	% of Usage of Alternate Energy to Total Energy Demand= (5)*100/ (6)	**17.44**	%

Photograph of Roof Top Solar PV Plant:

Dr N S Vyawahare

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BACK TO SUMMARY

ENGRESS SERVICES PUNE

CHAPTER VI
STUDY OF USAGE OF LED LIGHTS

In the following Table, we present the percentage of LED to Total Lighting Load.

Table No 8: Computation of Percent Usage of LED Usage to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	284	Nos
2	Demand of 40 W FTL Fitting	40	W/Unit
3	Total Electrical Load of 40 W FTL Fittings	**11.36**	kW
4	No of 20 W LED Tube Lights	78	Nos
5	Demand of 20 W LED Tube Light	20	W/Unit
6	Total Electrical Load of 20 W LED Fittings	**1.56**	kW
7	No of 16 W Panel LED Fittings	54	Nos
8	Demand of 16 W Panel LED Fittings	16	W/Unit
9	Total Electrical Load of 16 W Panel LED Fittings	**0.86**	kW
10	No of 11 W LED Fittings	220	Nos
11	Demand of 11 W LED Fittings	11	W/Unit
12	Total Electrical Load of 11 W LED Fittings	**2.42**	kW
13	No of PL Type 36 W CFL Fittings	26	Nos
14	Demand of PL Type 36 W CFL Fittings	36	W/Unit
15	Total Electrical Load of PL Type 36 W CFL Fittings	**0.936**	kW
16	Total LED Lighting Load= 6+9+12	**4.84**	kW
17	Total Lighting Load=3+6+9+12+15	**17.140**	kW
18	**Lighting Requirement met by LEDs = 16*100/17**	**28**	%

Dr N S Vyawahare

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BACK TO SUMMARY

ENGRESS SERVICES PUNE

GREEN AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

Year: 2021-22

Prepared by

ENGRESS SERVICES

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

ENGRESS SERVICES PUNE

Dr N S Vyawahare

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Date: 2023.06.15 11:25:23 +05'30'

BACK TO SUMMARY

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency

(Government of Maharashtra Institution)

Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandry, Aundh, Pune, Maharashtra 411067

Ph No: 020-35000450

Email: eeeg@mahaurja.com, Web: www.mahaurja.com

LCN/2022-23/CR-43/1709 10th May, 2023

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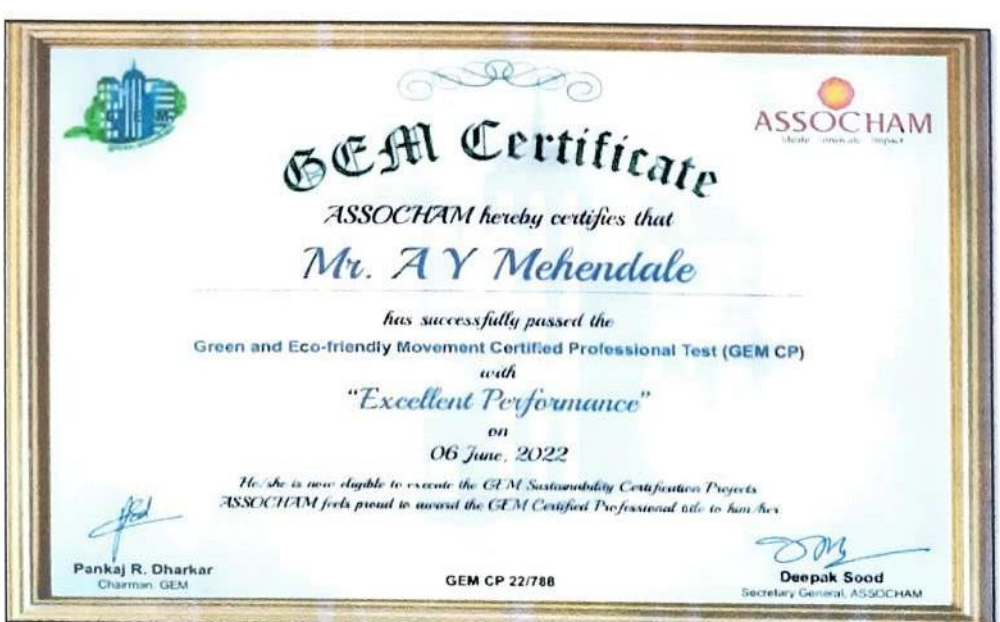
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)



BACK TO SUMMARY

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ENGRESS SERVICES

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

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

CERTIFICATE

This is to certify that we have conducted Green Audit at Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2021-22.

The College has adopted following Energy Efficient & Green practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 15.36 kWp Roof Top Solar PV Plant.
- Segregation of Waste at source
- Bio Composting Arrangement for Conversion of Leafy Waste
- Installation of Sewage Treatment Plant
- Implementation of Rain Water Management Project
- Good internal Road
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of awareness about Plastic Free Campus by Display of Posters

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

For Engress Services,

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

ENGRESS SERVICES PUNE

Dr N S Vyawahare
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Dr N S Vyawahare

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ENGRESS SERVICES PUNE

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ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Green Audit of Akurdi campus for the Academic Year: 2021-22.

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

Dr N S Vyawahare

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BACK TO SUMMARY

ENGRESS SERVICES PUNE

EXECUTIVE SUMMARY

1. Dr. D Y Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune consumes Energy in the form of Electrical Energy & LPG; used for various gadgets, Office & other facilities.

2. Present Energy Consumption, LPG Consumption & CO_2 Emissions:

No	Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 emissions, MT
1	Total	87227	114	78.81
2	Maximum	13654	19	12.34
3	Minimum	2185	3	1.97
4	Average	7268.92	9.5	6.57

3. Various Measures adopted for Energy Conservation:

- Usage of Energy Efficient LED Fittings
- Usage of Energy efficient STAR Rated Equipment
- Installation of 15.36 kWp Roof Top Solar PV Plant

4. Usage of Renewable Energy:

- The College has installed 15.36 kWp Roof Top Solar PV Plant.
- The Energy generated by Solar PV Plant in the Year: 21-22 is 18432 kWh.
- The reduction in CO_2 Emissions due to Solar PV Plant in 21-22 is 16.59 MT.

5. Waste Management:

5.1 Segregation of Waste at Source:

The waste is segregated at the source. There are Waste Collection Bins at various locations, to collect the Waste.

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity 100 KLPD. The treated Water is used for watering the Garden.

5.3 Bio Medical Waste Management:

The College has entered an MoU with PASCO, to dispose of the Bio Medical waste

5.4 E Waste Management:

It is recommended to dispose of The E Waste through authorized Agency.

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6. Rain Water Management:

The College has installed Rain Water Management Project; the Rain Water from the slopes is used to recharge the underground water table.

7. Green & Sustainable Practices:

- Well maintained internal road
- Well maintained Garden.
- Provision of Ramp for Divyangajan
- Creation of Awareness in respect of Plastic Free Campus by displaying 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 Solar PV system generates 4 kWh of Electrical Energy per Day
4. Annual Solar Energy Generation Days: 300 Nos

9. References:

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

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ABBREVIATIONS

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

Dr N S Vyawahare

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ENGRESS SERVICES PUNE

BACK TO SUMMARY

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
2	Address	Dr. D Y Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	1999

1.3 Google Earth Image:

Dr N S Vyawahare
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ENGRESS SERVICES PUNE

BACK TO SUMMARY

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

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

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

No	Month	Energy Purchased, kWh	LPG Consumed, Kg
1	Apr-21	2185	3
2	May-21	3165	4
3	Jun-21	3385	4
4	Jul-21	2714	8
5	Aug-21	2652	9
6	Sep-21	4942	9
7	Oct-21	7695	9
8	Nov-21	9925	9
9	Dec-21	11936	10
10	Jan-22	12985	11
11	Feb-22	11989	19
12	Mar-22	13654	19
13	Total	87227	114
14	Maximum	13654	19
15	Minimum	2185	3
16	Average	7268.92	9.5

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

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Dr N S Vyawahare
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Chart No 2: To study the variation of Month wise LPG Consumption, kWh:

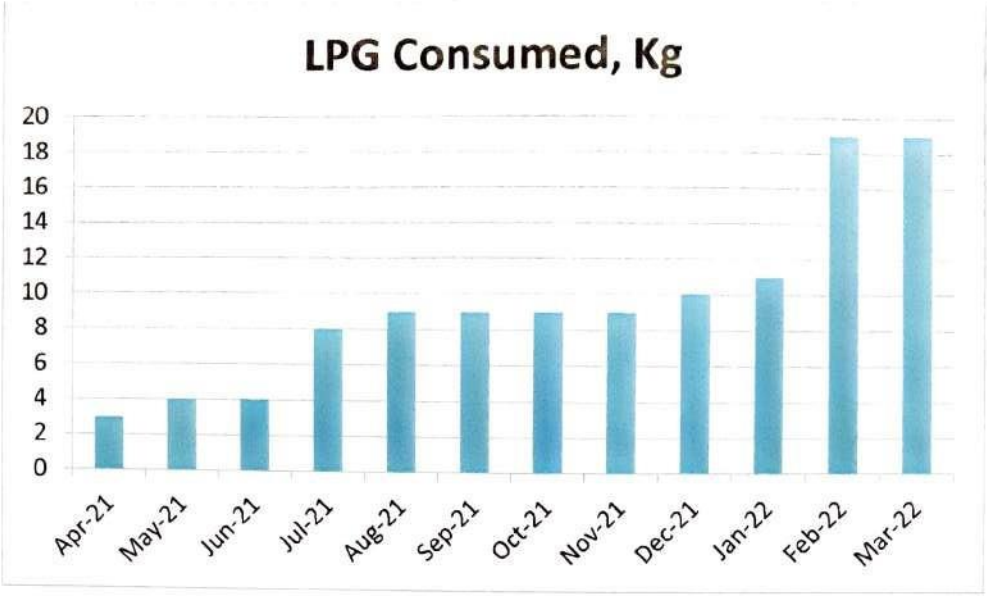

Table No 3: Key Parameters:

No	Parameter	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	87227	114
2	Maximum	13654	19
3	Minimum	2185	3
4	Average	7268.92	9.5

Dr N S Vyawahare

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BACK TO SUMMARY

CHAPTER-III
STUDY OF CARBON FOOT PRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy & LPG is 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 Consumed, Kg	CO_2 Emissions, MT
1	Apr-21	2185	3	1.97
2	May-21	3165	4	2.86
3	Jun-21	3385	4	3.06
4	Jul-21	2714	8	2.46
5	Aug-21	2652	9	2.41
6	Sep-21	4942	9	4.47
7	Oct-21	7695	9	6.95
8	Nov-21	9925	9	8.96
9	Dec-21	11936	10	10.77
10	Jan-22	12985	11	11.72
11	Feb-22	11989	19	10.84
12	Mar-22	13654	19	12.34
13	Total	87227	114	78.81
14	Maximum	13654	19	12.34
15	Minimum	2185	3	1.97
16	Average	7268.92	9.5	6.57

BACK TO SUMMARY

Dr N S Vyawahare

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Chart No 3: Representation of Month wise CO_2 emissions:

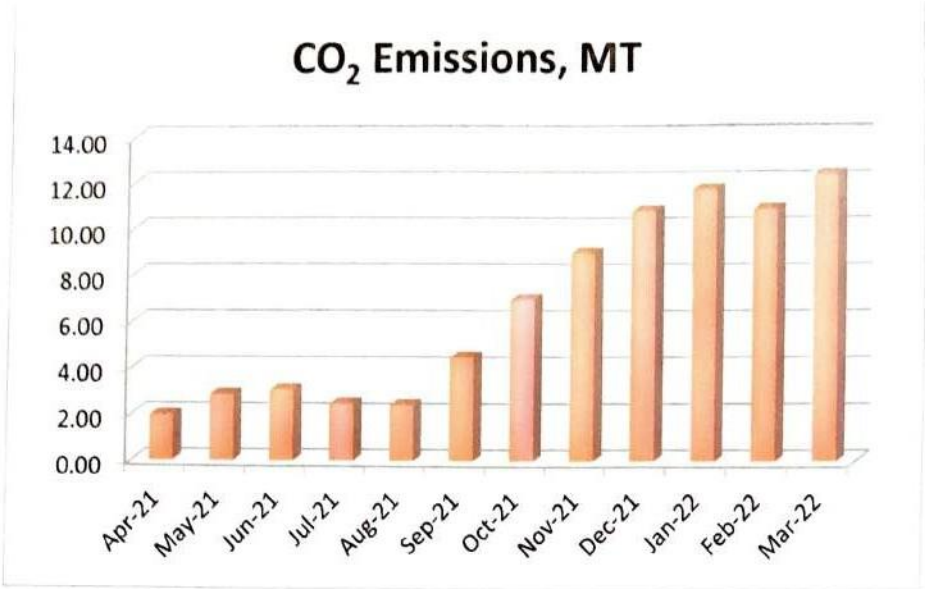

Table No 5: Key Parameters:

No	Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 emissions, MT
1	Total	87227	114	78.81
2	Maximum	13654	19	12.34
3	Minimum	2185	3	1.97
4	Average	7268.92	9.5	6.57

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BACK TO SUMMARY

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed a Roof Top Solar PV Plant of capacity **15.36 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	15.36	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**18432**	kWh
5	1 kWh of Electrical Energy emits	**0.9**	Kg of CO_2
6	Annual Reduction in CO2 Emissions = (4) * (5) /1000	**16.59**	MT

Photograph of Roof Top Solar PV Plant:

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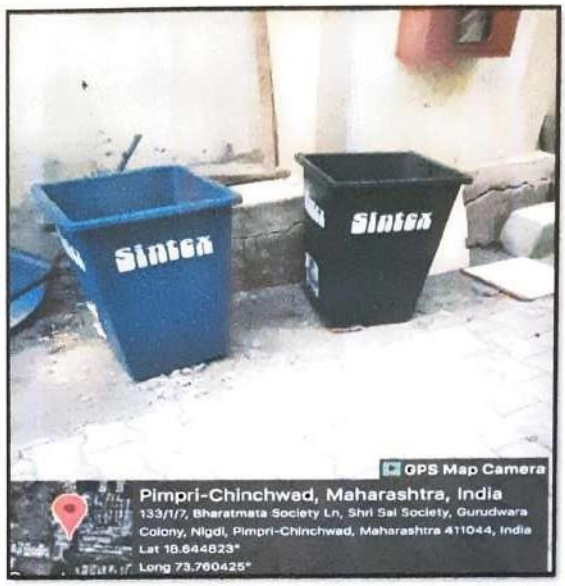
BACK TO SUMMARY

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The College has good housekeeping practices. The Waste is segregated at source. Waste collection Bins are placed at strategic locations.

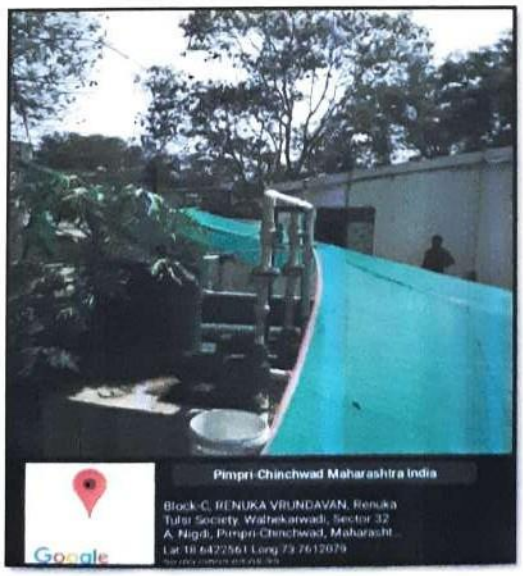
Photograph of Waste Collection Bin:



5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **100 KLPD.** The treated Water is used for Watering the internal Garden.

Photograph of Sewage Treatment Plant:



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ENGRESS SERVICES PUNE

BACK TO SUMMARY

5.3 Bio Medical Waste Management:

The College has entered an MoU with PASCO, to dispose of the Bio Medical waste

5.4 E Waste Management:

It is recommended to dispose of The E Waste through authorized Agency.

Dr N S Vyawahare

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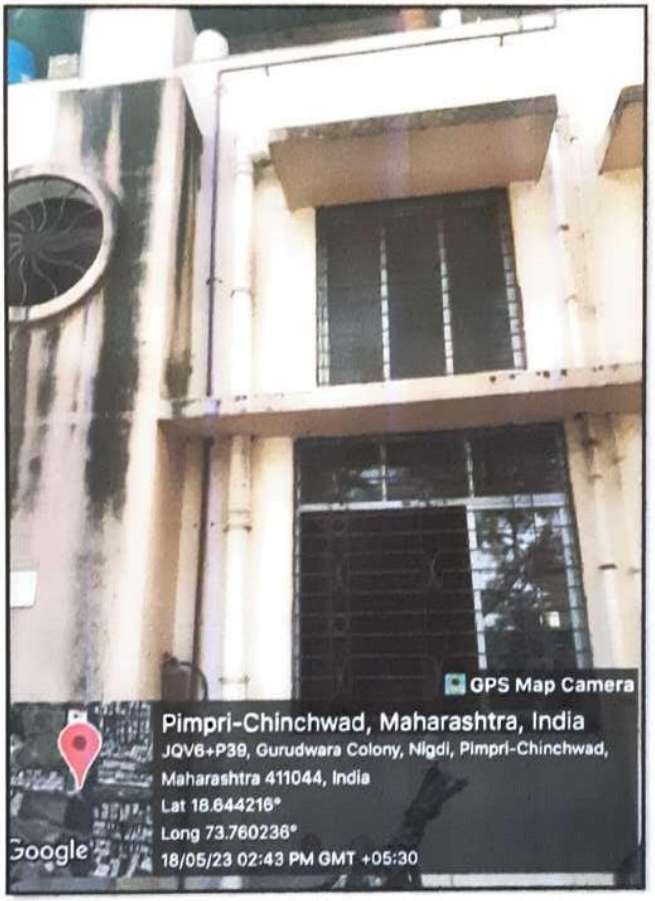
ENGRESS SERVICES PUNE

BACK TO SUMMARY

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project; the Rain Water from the terrace and slopes is used to recharge the underground water table.

Photograph of Rain Water Carrying Pipe:



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BACK TO SUMMARY

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Internal Road:

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

Photograph of Internal Road:

7.2 Tree Plantation:

The College has well maintained lawn and Tree Plantation in the campus.

Photograph of Internal Tree Plantation:

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ENGRESS SERVICES PUNE

BACK TO SUMMARY

7.3 Provision of Ramp for Divyangajan:

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

Photograph of Ramp:

7.4 Creation of Awareness about Resource Conservation:

The College has displayed Posters on Importance of Plastic Free Campus.

Photograph of Poster on Plastic Free Campus:

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BACK TO SUMMARY

ANNEXURE I
DETAILS OF TREES & PLANTS IN THE CAMPUS

List of Trees and Plants:

No	Common Name of Tree/Plant	Qty
1	Chafa	52
2	SonChafa	17
3	Pimpal	4
4	Vad	3
5	Umbar	6
6	Gulmohor	34
7	Sisum	5
8	Neem	11
9	Bahava	33
10	Karanj	7
11	Suru	11
12	Kanchan	42
13	Bakul	1
14	Coconut	21
15	Ber	3
16	Almond	4
17	Jamun	7
18	Jack fruit	2
19	Cashew nut	1
20	Custard Apple	4
21	Guava	7
22	Mango	24
23	Pomegranate	1
24	Drum stick	16
25	Traveller Palm	1
26	Foxtail Palm	20
27	Christmas Tree	18
28	Bottle Palm	66
29	Bottle Brush	25
30	Ficus- Black	45

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ENGRESS SERVICE PUNE

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31	Ficus- Safari	5
32	Spatodium	48
33	Rubber Plant	6
34	Acacia	106
35	Saptaparni	46
36	Fern	81
37	Ticoma	5
38	Silver Oak	26
39	Pentas	12
40	Jatropha	17
41	Lemon	1
42	Areca nut	16
43	**Total**	**860**

Dr N S Vyawahare

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ENVIRONMENTAL AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

Year: 2021-22

Prepared by

ENGRESS SERVICES

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

ENGRESS SERVICES PUNE

Dr N S Vyawahare

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Date: 2023.06.15 11:37:50 +05'30'

BACK TO SUMMARY

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: 020-35060450
Email: ceeg@mahaurja.com, Web: www.mahaurja.com

MEDA/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 (ECS)

ASSOCHAM

GEM Certificate

ASSOCHAM hereby certifies that

Mr. A Y Mehendale

has successfully passed the

Green and Eco-friendly Movement Certified Professional Test (GEM CP)

with

"Excellent Performance"

on

06 June, 2022

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

Pankaj R. Dharkar
Chairman, GEM

GEM CP 22/788

Deepak Sood
Secretary General, ASSOCHAM

ENGRESS SERVICES PUNE

Dr N S Vyawahare

Digitally signed by Dr N S Vyawahare
Date: 2023.06.15 11:38:14 +05'30'

BACK TO SUMMARY

ENGRESS SERVICES

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

Ref: ES/DYPCOP/21-22/03 Date: 12/6/2022

CERTIFICATE

This is to certify that we have conducted Environment Audit at Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2021-22.

The College has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 15.36 kWp Roof Top Solar PV Plant.
- Segregation of Waste at source
- Bio Composting Arrangement for Disposal of Leafy Waste
- Installation of Sewage Treatment Plant
- Implementation of Rain Water Management Project
- Tree Plantation in the campus
- Creation of awareness about Plastic Free Campus by Display of Posters

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

For Engress Services,

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

ENGRESS SERVICES PUNE

Dr N S Vyawahare
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Dr N S Vyawahare

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ENGRESS SERVICES PUNE

BACK TO SUMMARY

ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Environmental Audit of Akurdi campus for the Academic Year: 2021-22.

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

Dr N S Vyawahare

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Date: 2023.06.15 11:41:16 +05'30'

BACK TO SUMMARY

EXECUTIVE SUMMARY

1. Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune consumes Energy in the form of Electrical Energy & LPG; used for various gadgets, Office & other facilities.

2. Pollution caused due to College Activities:

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

3. Present Energy, LPG Consumption & CO_2 Emissions:

No	Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 emissions, MT
1	Total	87227	114	78.81
2	Maximum	13654	19	12.34
3	Minimum	2185	3	1.97
4	Average	7268.92	9.5	6.57

4. Projects implemented for Environmental Conservation:

- Installation of 15.36 kWp Roof Top Solar PV Plant
- In campus Tree Plantation
- Installation of Sewage Treatment Plant

5. Usage of Renewable Energy & CO_2 Emission Reduction:

- The College has installed 15.36 kWp Roof Top Solar PV Plant.
- The Energy generated by Solar PV Plant in the Year: 21-22 is 18432 kWh.
- The reduction in CO_2 Emissions due to Solar PV Plant in 21-22 is 16.59 MT.

6. Indoor Air Quality:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	50	31	38
2	Minimum	30	23	26

7. Indoor Comfort Condition Parameters:

No	Parameter/Value	Temperature, ^0C	Humidity, %	Lux Level	Noise Level, dB
1	Maximum	27.8	47	201	45.6
2	Minimum	27.6	46	138	39

BACK TO SUMMARY

Dr N S Vyawahare

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Date: 2023.06.15 11:42:16 +05'30'

ENGRESS SERVICES PUNE

8. Waste Management:

8.1 Segregation of Waste at Source:

The waste is segregated at the source. There are Waste Collection Bins at various locations, to collect the Waste.

8.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity 100 KLPD. The treated Water is used for watering the Garden.

8.3 Bio Medical Waste Management:

The College has entered an MoU with PASCO, to dispose of the Bio Medical waste

8.4 E Waste Management:

It is recommended to dispose of The E Waste through authorized Agency.

9. Rain Water Management:

The College has installed Rain Water Management Project; the Rain Water from the terrace and slopes is used to recharge the underground water table.

10. Environment Friendly Initiatives:

- Tree Plantation and Well maintained Garden.
- Creation of Awareness in respect of Plastic Free Campus by displaying posters

11. 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 Solar PV system generates 4 kWh of Electrical Energy per Day
4. Annual Solar Energy Generation Days: 300 Nos

12. References:

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

BACK TO SUMMARY

Dr N S Vyawahare

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Date: 2023.06.15 11:42:54 +05'30'

ABBREVIATIONS

kWh	:	kilo-Watt Hour
Qty	:	Quantity
MT	:	Metric Ton
CO_2	:	Carbon Di Oxide
kWp	:	Kilo Watt Peak
AQI	:	Air Quality Index
PM2.5	:	Particulate Matter of Size 2.5 microns
PM 10	:	Particulate Matter of Size 10 microns
CPCB	:	Central Pollution Control Board
ISHARE	:	The Indian Society of Heating & Refrigerating & Air Conditioning Engineers

Dr N S Vyawahare

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ENGRESS SERVICES PUNE

BACK TO SUMMARY

CHAPTER-I
INTRODUCTION

1.1. Important Definitions:

1.1.1Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.1.4. Relevant Environmental Laws in India: Table No-1:

1927	The Indian Forest Act
1972	The Wildlife Protection Act
1974	The Water (Prevention and Control of Pollution) Act
1977	The Water (Prevention & Control of Pollution) Cess Act
1980	The Forest (Conservation) Act
1981	The Air (Prevention and Control of Pollution) Act
1986	The Environment Protection Act
1991	The Public Liability Insurance Act
2002	The Biological Diversity Act
2010	The National Green Tribunal Act

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

1989	Hazardous Waste (Management and Handling) Rules
1989	Manufacture, Storage and Import of Hazardous Chemical Rules
2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Siting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules
2011	E-waste (Management and Handling) Rules

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2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research College)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency
10	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

1.2 Audit Methodology:

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

1.3 Google Earth Image:

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1.4 General Details of College: Table No: 4:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
2	Address	Dr. D. Y. Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	1999

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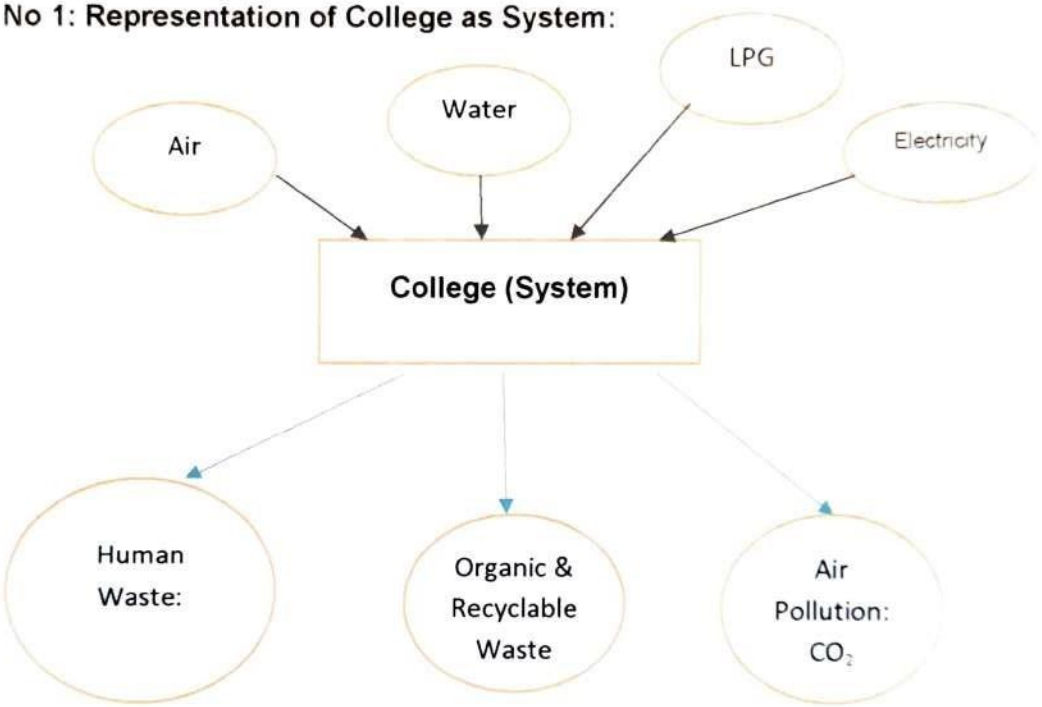
CHAPTER-II
STUDY OFRESOURCECONSUMPTION & CO_2 EMISSION

The College consumes following Natural/derived Resources:

1. Air
2. Water
3. Electrical Energy

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

Chart No 1: Representation of College as System:



A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. Here 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 basis of Calculation for CO_2 emissions due to Electrical Energy is:

- **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

Table No 5: Study of Energy, LPG Consumption & CO_2 Emission: 2021-22:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Apr-21	2185	3	1.97
2	May-21	3165	4	2.86
3	Jun-21	3385	4	3.06

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4	Jul-21	2714	8	2.46
5	Aug-21	2652	9	2.41
6	Sep-21	4942	9	4.47
7	Oct-21	7695	9	6.95
8	Nov-21	9925	9	8.96
9	Dec-21	11936	10	10.77
10	Jan-22	12985	11	11.72
11	Feb-22	11989	19	10.84
12	Mar-22	13654	19	12.34
13	Total	87227	114	78.81
14	Maximum	13654	19	12.34
15	Minimum	2185	3	1.97
16	Average	7268.92	9.5	6.57

Chart No 2: Representation of Month wise CO_2 emissions:

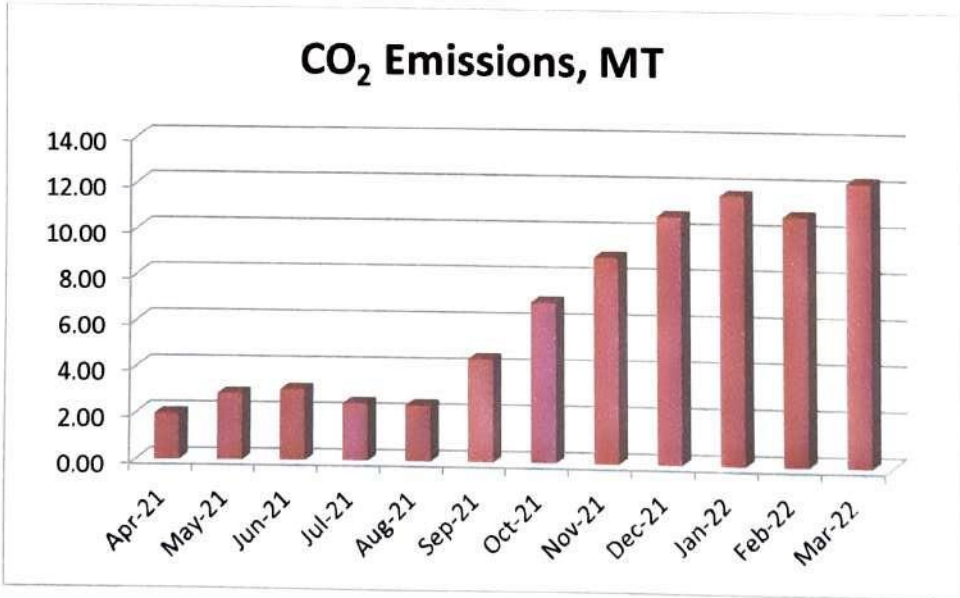

Table No 6: Key Parameters:

No	Value	Energy Purchased, kWh	LPG Consumed, Kg	CO_2 emissions, MT
1	Total	87227	114	78.81
2	Maximum	13654	19	12.34
3	Minimum	2185	3	1.97
4	Average	7268.92	9.5	6.57

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CHAPTER-III
STUDY OF CO_2 EMISSION REDUCTION

The College has installed a Roof Top Solar PV Plant of capacity **15.36 kWp.**

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

Table No 7: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	15.36	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**18432**	kWh
5	1 kWh of Electrical Energy emits	**0.9**	Kg of CO_2
6	Annual Reduction in CO2 Emissions = (4) * (5) /1000	**16.59**	MT

Photograph of Roof Top Solar PV Plant:

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CHAPTER IV
STUDY OF INDOOR AIR QUALITY

4.1 Importance of Air Quality:

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

By volume, Dry Air contains 78.09% Nitrogen, 20.95% Oxygen, 0.93% Argon, 0.039% carbon dioxide, and small amounts of other gases.

On average, a person inhales about **14,000 liters** of air every day. Therefore, poor air quality may affect the quality of life now and for future generations by affecting the health, the environment, the economy and the city's liveability.

Rapid urbanization and industrialization has added other elements/compounds to the pure air and thus caused the increase in pollution. In order to prevent, control and abate air pollution, the Air (Prevention and Control of Pollution) Act was enacted in 1981.

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

According to Section 2(b) of Air (Prevention and control of pollution) Act, 1981 '**air pollution**' has been defined as **'the presence in the atmosphere of any air pollutant.'**

As per Section 2(a) of Air (Prevention and control of pollution) Act, 1981 '**air pollutant**' has been defined as **'any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment**

4.2 Air Quality Index:

An **Air Quality Index (AQI)** is a number used by government agencies to measure the **air pollution** levels and communicate it to the population. As the AQI increases, it means that a large percentage of the population will experience severe adverse health effects. The measurement of the **AQI** requires an **air monitor** and an **air pollutant** concentration over a specified **averaging period**.

We present herewith following important Parameters.

1. AQI- Air Quality Index
2. PM 2.5- Particulate Matter of Size 2.5
3. PM 2.5- Particulate Matter of Size 2.5

Table No 8: Indoor Air Quality Parameters:

No	Location	AQI	PM-2.5	PM-10
	Basement			
1	Faculty Room	30	30	35

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2	Pharmachemistry Lab	46	27	34
	Ground Floor			
3	Library	40	24	27
4	Pharmaceutics Department	41	25	30
5	Faculty Room	39	23	26
	First Floor			
6	Admin Office	43	26	32
7	Board Room	44	28	37
	Second Floor			
8	Training & Placement Cell	50	30	38
9	Seminar Hall	47	31	33
	Maximum	**50**	**31**	**38**
	Minimum	**30**	**23**	**26**

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CHAPTER V
STUDY OF INDOOR COMFORT CONDITION PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit.

The Parameters include:

1. Temperature
2. Humidity
3. Lux Level
4. Noise Level.

Table No 9: Study of Indoor Comfort Parameters:

No	Location	Temperature, 0C	Humidity, %	Lux Level	Noise Level, dB
	Basement				
1	Faculty Room	26	59	175	39
2	Pharmachemistry Lab	26.1	59.1	139	41
	Ground Floor				
3	Library	26.5	58	125	43
4	Pharmaceutics Department	27.2	58.9	138	44
5	Faculty Room	27.5	59	146	45
	First Floor				
6	Admin Office	28	59.1	120	46
7	Board Room	28.1	59	119	49
	Second Floor				
8	Training & Placement Cell	25	58.7	138	48
9	Seminar Hall	28	58.6	165	43
	Maximum	28.1	59.1	175	49
	Minimum	25	58	119	39

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CHAPTER VI
STUDY OF WASTE MANAGEMENT

6.1 Segregation of Waste at Source:

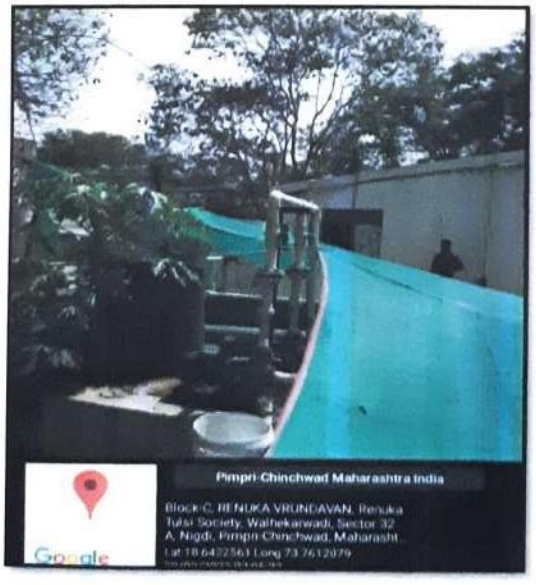
The College has good housekeeping practices. The Waste is segregated at source. Waste collection Bins are placed at strategic locations.

Photograph of Waste Collection Bin:

6.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **100 KLPD.** The treated Water is used for Watering the internal Garden.

Photograph of Sewage Treatment Plant:



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6.3 Bio Medical Waste Management:

The College has entered an MoU with PASCO, to dispose of the Bio Medical waste

6.4 E Waste Management:

It is recommended to dispose of The E Waste through authorized Agency.

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CHAPTER-VII
STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project; the Rain Water from the terrace and slopes is used to recharge the underground water table.

Photograph of Rain Water Carrying Pipe:

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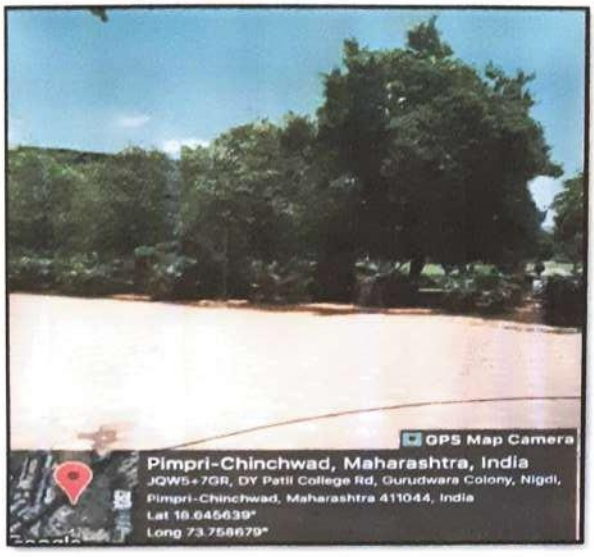
CHAPTER-VIII
STUDY OF ENVIRONMENT FRIENDLY PRACTICES

8.1Tree Plantation in the Campus:

The College has landscaped Lawn and well maintained Tree Plantation in the campus.

Photograph of Tree Plantation:



8.2 Creation of Awareness about Resource Conservation:

The College has displayed Posters on Importance of Plastic Free Campus.

Photograph of Poster on Plastic Free Campus:

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ANNEXURE:
AIR QUALITY, NOISE & INDOOR COMFORT STANDARDS:

1. Category Wise Air Quality Index Values & Concentration of PM 2.5 & PM10:

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

2. Recommended Noise Level Standards:

No	Location	Noise Level dB
1	Auditoriums	20-25
2	Outdoor Playground	55
3	Occupied Class Room	40-45
4	Un occupied Class Room	35
5	Apartment, Homes	35-40
6	Offices	45-50
7	Libraries	35-40
8	Restaurants	50-55

4. Thermal Comfort Conditions: For Non-conditioned Buildings:

No	Parameter	Value
1	Temperature	Less Than 33^{0}C
2	Humidity	Less Than 70%

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Dr. D. Y. Patil Pratishthan's
Dr. D. Y. PATIL COLLEGE OF PHARMACY
Dr. D. Y. Patil Educational Complex, Sector - 29, Pradhikaran, Akurdi, Pune 411 044.
Tel. : 020-27656141, Tel. Fax : 020-27656141
E-mail : info@dyppharmaakurdi.ac.in Web : www.dyppharmaakurdi.ac.in
Approved by : All India Council for Techinical Education, New Delhi
Pharmacy Council of India, New Delhi. Recognized by : Government of Maharashtra
Affiliated to Savitribai Phule Pune University, Pune

Dr. Sanjay D. Patil
President

Padmashree Dr. D. Y. Patil
Founder

Shri. Satej D. Patil
Vce-President & Chairman

Dr. N. S. Vyawahare
Principal

Ref. No. : DYPCOP/
Date :

2020-21

Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy ★ Akurdi, Pune - 44.

Dr N S Vyawahare

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ENERGY AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

DR. D. Y. PATIL COLLEGE OF PHARMACY

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

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MAHARASHTRA ENERGY DEVELOPMENT AGENCY

An ISO 9001 : 2000 Reg. no. : RC 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)

Dr N S Vyawahare

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Enrich Consultants

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

Ref: EC/DYPCOP/20-21/01

Date: 19/7/2021

CERTIFICATE

This is to certify that we have conducted Energy Audit at Dr. D. Y. Patil Pratishthan's, Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2020-21.

The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 15.36 kWp Roof Top Solar PV Plant.

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

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Dr N S Vyawahare

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's Dr. D.Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Energy Audit of Akurdi campus for the Academic Year: 2020-21.

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

Dr N S Vyawahare

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EXECUTIVE SUMMARY

1. Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune consumes Energy in the form of Electrical Energy; used for various gadgets, Office & other facilities.

2. Present Energy, LPG Consumption & CO_2 Emissions:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	54796	76	49.52
2	Maximum	7102	12	6.42
3	Minimum	1075	1	0.97
4	Average	4566.33	6.33	4.13

3. Measures Adopted for Energy Conservation:

- Usage of Energy efficient LED fittings
- Usage of BEE STAR Rated Equipment
- Installation of 15.36 kWp Roof Top Solar PV Plant

4. Usage of Alternate / Renewable Energy:

- The College has installed 15.36 kWp Roof Top Solar PV Plant.
- The Energy purchased from MSEDCL in 20-21 is 54796 kWh
- Energy generated by Solar PV Plant is 18432 kWh
- Total Annual Energy Demand of the College is 73228 kWh
- The percentage of Alternate Energy to Annual Energy Demand is 25.17 %.

5. Usage of LED Lighting:

- The Total LED Lighting Load is 4.47 kW.
- The Total Lighting Load is 17.245 kW.
- The % of LEDs to Total Lighting Load is 26 %.

6. 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. Average Energy generated by 1 kWp Roof Top Solar PV System: 4 kWh
4. Annual Solar Energy Generation Days: 300 Nos

7. References:

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

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ABBREVIATIONS

AC	:	Air conditioner
MCA	:	Master in Computer Applications
LED	:	Light Emitting Diode
PL	:	Pin Type Light Fitting
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
D/L	:	Down Lighter
PC	:	Personal Computer
MT	:	Metric Ton

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CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No1: General Details of College:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
2	Address	Dr. D. Y. Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	2002

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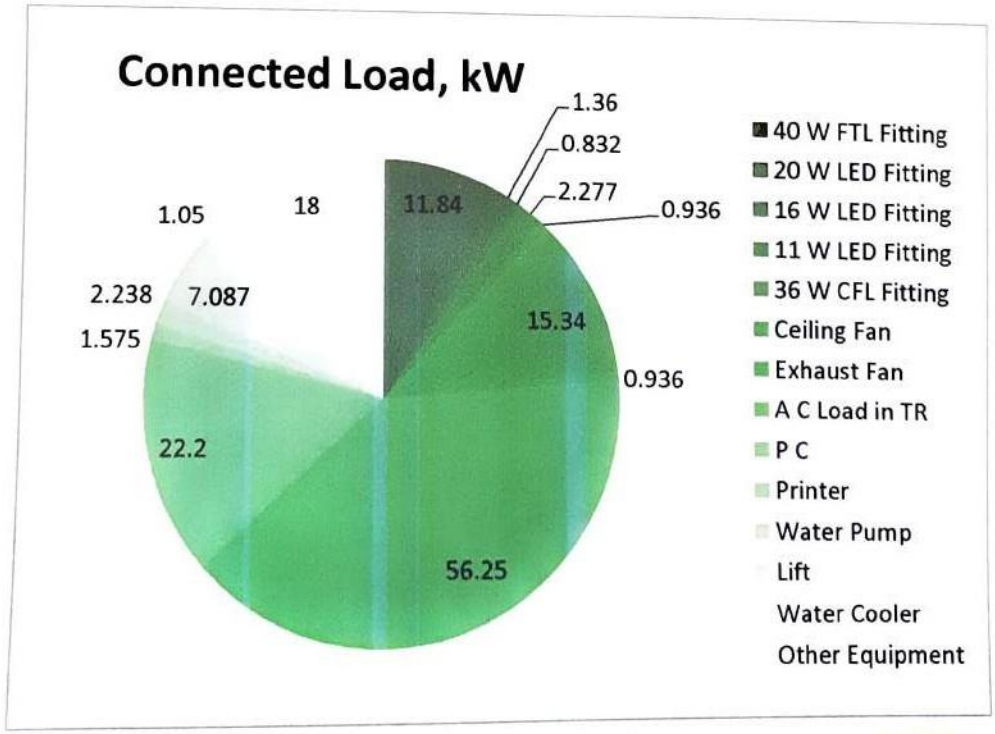
CHAPTER-II
STUDY OF CONNECTED LOAD

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

Table No 2: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	40 W FTL Fitting	296	40	11.84
2	20 W LED Fitting	68	20	1.36
3	16 W LED Fitting	52	16	0.832
4	11 W LED Fitting	207	11	2.277
5	36 W CFL Fitting	26	36	0.936
6	Ceiling Fan	236	65	15.34
7	Exhaust Fan	18	52	0.936
8	A C Load in TR	45	1250	56.25
9	P C	148	150	22.2
10	Printer	9	175	1.575
11	Water Pump	1	2238	2.238
12	Lift	1	7087	7.087
13	Water Cooler	3	350	1.05
14	Other Equipment	120	150	18
15	**Total**			**142**

Chart No 1: Details of Connected Load:



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CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 3: Electrical Energy & LPG Consumption Analysis- 2020-21:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg
1	Apr-20	1075	1
2	May-20	1075	2
3	Jun-20	1075	1
4	Jul-20	6354	3
5	Aug-20	4725	4
6	Sep-20	4639	10
7	Oct-20	4796	8
8	Nov-20	4802	8
9	Dec-20	5365	8
10	Jan-21	6852	9
11	Feb-21	6936	12
12	Mar-21	7102	10
13	Total	54796	76
14	Maximum	7102	12
15	Minimum	1075	1
16	Average	4566.33	6.33

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

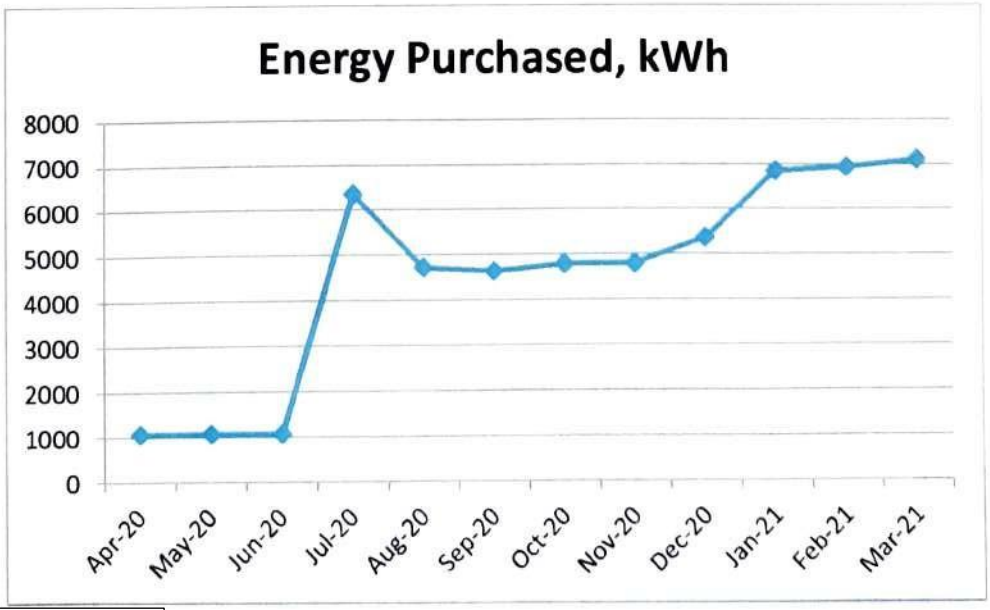

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Chart No 3: To study the variation of Month wise LPG Consumption, Kg:

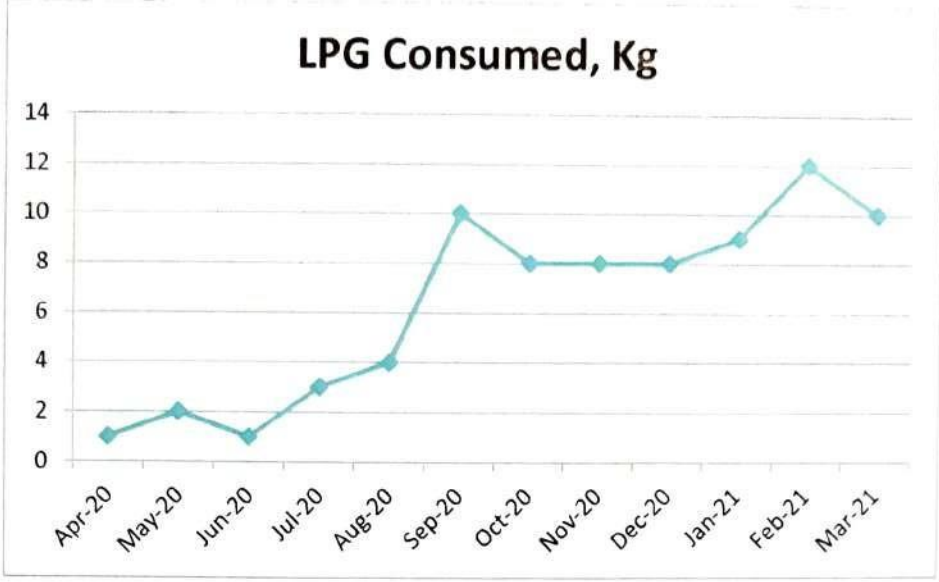

Table No 4: Key Parameters:

No	Parameter	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	54796	76
2	Maximum	7102	12
3	Minimum	1075	1
4	Average	4566.33	6.33

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CHAPTER-IV
STUDY OF CARBON FOOT PRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is:

- **1 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 5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Apr-20	1075	1	0.97
2	May-20	1075	2	0.97
3	Jun-20	1075	1	0.97
4	Jul-20	6354	3	5.73
5	Aug-20	4725	4	4.26
6	Sep-20	4639	10	4.20
7	Oct-20	4796	8	4.34
8	Nov-20	4802	8	4.34
9	Dec-20	5365	8	4.85
10	Jan-21	6852	9	6.19
11	Feb-21	6936	12	6.27
12	Mar-21	7102	10	6.42
13	Total	54796	76	49.52
14	Maximum	7102	12	6.42
15	Minimum	1075	1	0.97
16	Average	4566.33	6.33	4.13

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BACK TO SUMMARY

Chart No 4: Representation of Month wise CO_2 emissions:

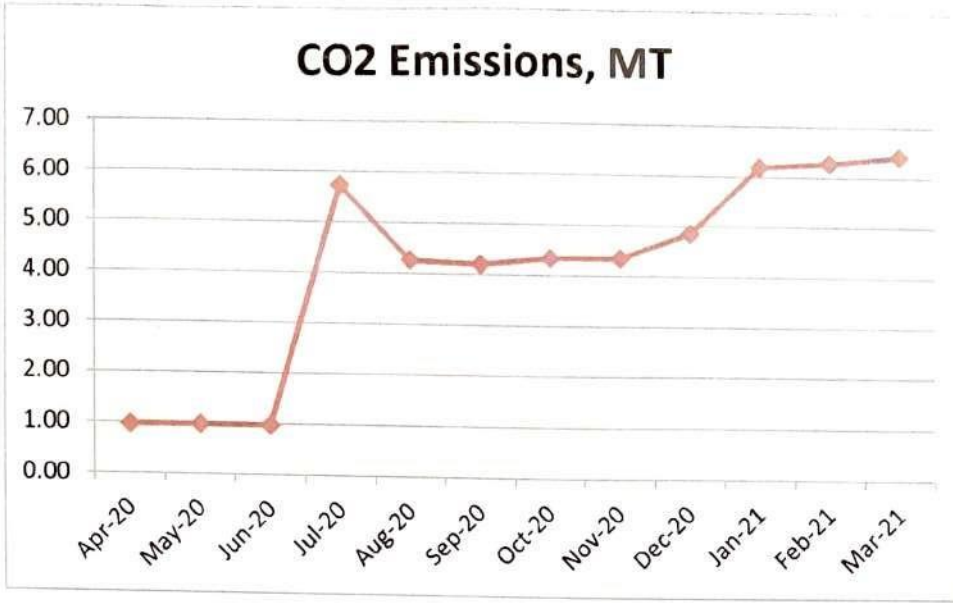

Table No 6: Key Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	54796	76	49.52
2	Maximum	7102	12	6.42
3	Minimum	1075	1	0.97
4	Average	4566.33	6.33	4.13

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BACK TO SUMMARY

CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

The College has installed **15.36 kWp** Roof Top Solar PV Plant.

In this Chapter, we compute the percentage of usage of Alternate / Renewable Energy to Annual Energy Demand of the College.

Table No 7: Computation of % usage of Alternate Energy to Annual Energy Demand:

No	Particulars	Value	Unit
1	Energy Purchased from MSEDCL	**54796**	kWh
2	Installed Roof Top Solar PV Plant Capacity	15.36	kWp
3	Average Daily Energy Generated	4	kWh/kWp
4	Annual Generation Days	300	Nos
5	Annual Solar Energy Generated	**18432**	kWh
6	Total Energy Demand = (1) + (5)	**73228**	kWh
7	% of Usage of Alternate Energy to Total Energy Demand= (5)*100/ (6)	**25.17**	%

Photograph of Roof Top Solar PV Plant:

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BACK TO SUMMARY

CHAPTER VI
STUDY OF USAGE OF LED LIGHTS

In the following Table, we present the percentage of Total Lighting load met by LED lights.

Table No 8: Computation of Usage of LEDs to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	296	Nos
2	Demand of 40 W FTL Fitting	40	W/Unit
3	Total Electrical Load of 40 W FTL Fittings	**11.84**	kW
4	No of 20 W LED Tube Lights	68	Nos
5	Demand of 20 W LED Tube Light	20	W/Unit
6	Total Electrical Load of 20 W LED Fittings	**1.36**	kW
7	No of 16 W Panel LED Fittings	52	Nos
8	Demand of 16 W Panel LED Fittings	16	W/Unit
9	Total Electrical Load of 16 W Panel LED Fittings	**0.83**	kW
10	No of 11 W LED Fittings	207	Nos
11	Demand of 11 W LED Fittings	11	W/Unit
12	Total Electrical Load of 11 W LED Fittings	**2.277**	kW
13	No of PL Type 36 W CFL Fittings	26	Nos
14	Demand of PL Type 36 W CFL Fittings	36	W/Unit
15	Total Electrical Load of PL Type 36 W CFL Fittings	**0.936**	kW
16	Total LED Lighting Load= 6+9+12	**4.47**	kW
17	Total Lighting Load=3+6+9+12+15	**17.245**	kW
18	**Annual Lighting Requirement met by LED= 16*100/17**	**26**	%

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BACK TO SUMMARY

GREEN AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

DR. D. Y. PATIL COLLEGE OF PHARMACY

Year: 2020-21

Prepared by

ENRICH CONSULTANTS

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

ENRICH CONSULTANTS PUNE

Dr N S Vyawahare

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BACK TO SUMMARY

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

FCN/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)

Dr N S Vyawahare

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Date: 2023.06.15 12:00:09 +05'30'

BACK TO SUMMARY

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/DYPIMCA/20-21/02 Date: 19/7/2021

CERTIFICATE

This is to certify that we have conducted Green Audit at Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2020-21.

The College has adopted following Energy Efficient & Green practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 15.36 kWp Roof Top Solar PV Plant.
- Segregation of Waste at source
- Installation of Sewage Treatment Plant
- Implementation of Rain Water Management Project
- Good internal Road
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of awareness about Water Conservation by Display of Posters

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS PUNE

Dr N S Vyawahare

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Dr N S Vyawahare

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Date: 2023.06.15 12:01:04 +05'30'

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Green Audit of Akurdi campus for the Academic Year: 2020-21.

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

BACK TO SUMMARY

Dr N S Vyawahare

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Date: 2023.06.15 12:01:37 +05'30'

EXECUTIVE SUMMARY

1. Dr. D Y Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune consumes Energy in the form of Electrical Energy & LPG; used for various gadgets, Office & other facilities.

2. Present Energy, LPG Consumption & CO_2 Emissions:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	54796	76	49.52
2	Maximum	7102	12	6.42
3	Minimum	1075	1	0.97
4	Average	4566.33	6.33	4.13

3. Measures Adopted for Energy Conservation:

- Usage of Energy Efficient LED Fittings
- Usage of Energy efficient STAR Rated Equipment
- Installation of 15.36 kWp Roof Top Solar PV Plant

4. Usage of Renewable Energy:

- The College has installed 15.36 kWp Roof Top Solar PV Plant.
- The Energy generated by Solar PV Plant in the Year: 20-21 is 18432 kWh.
- The reduction in CO_2 Emissions due to Solar PV Plant in 20-21 is 16.59 MT.

5. Waste Management:

5.1 Segregation of Waste at Source:

The waste is segregated at the source. There are Waste Collection Bins at various locations, to collect the Waste.

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity 100 KLPD. The treated Water is used for watering the Garden.

5.3 Bio Medical Waste Management:

The College has entered an MoU with PASCO, to dispose of the Bio Medical waste

6. Rain Water Management:

The College has installed Rain Water Management Project; the Rain Water from the terrace is used to recharge the underground water table.

BACK TO SUMMARY

Dr N S Vyawahare

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7. Green & Sustainable Practices:

- Well maintained internal road
- Well maintained Garden.
- Provision of Ramp for Divyangajan
- Creation of Awareness in respect of Water Conservation by displaying 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. Average Energy generated by 1 kWp Roof Top Solar PV System: 4 kWh
4. Annual Solar Energy Generation Days: 300 Nos

9. References:

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

Dr N S Vyawahare

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ABBREVIATIONS

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

Dr N S Vyawahare

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BACK TO SUMMARY

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
2	Address	Dr. D Y Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	2002

BACK TO SUMMARY

Dr N S Vyawahare Digitally signed by Dr N S Vyawahare Date: 2023.06.15 12:05:02 +05'30'

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Study of Energy, LPG Consumption Analysis- 2020-21:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg
1	Apr-20	1075	1
2	May-20	1075	2
3	Jun-20	1075	1
4	Jul-20	6354	3
5	Aug-20	4725	4
6	Sep-20	4639	10
7	Oct-20	4796	8
8	Nov-20	4802	8
9	Dec-20	5365	8
10	Jan-21	6852	9
11	Feb-21	6936	12
12	Mar-21	7102	10
13	Total	54796	76
14	Maximum	7102	12
15	Minimum	1075	1
16	Average	4566.33	6.33

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

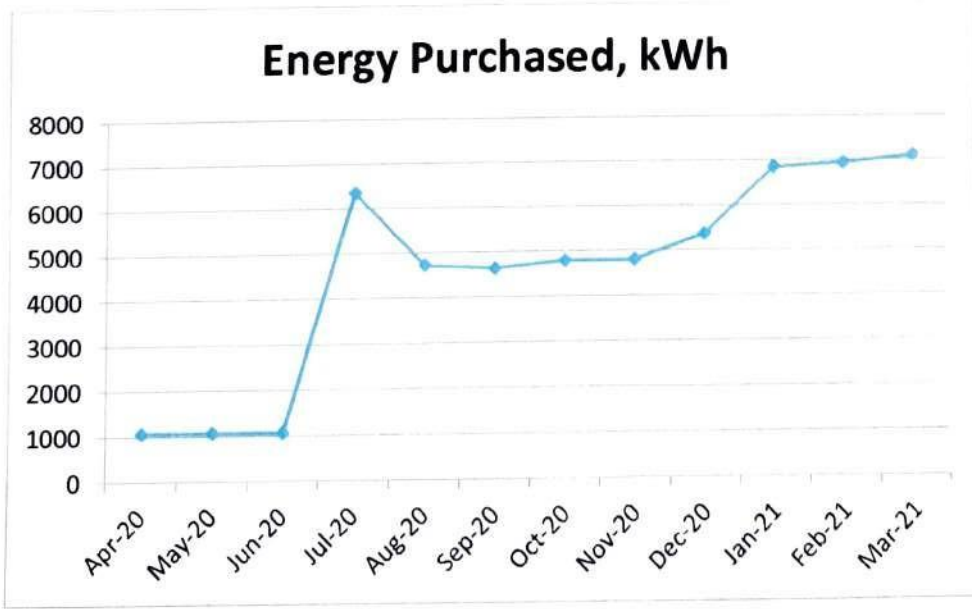

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Chart No 2: To study the variation of Month wise LPG Consumption, Kg:

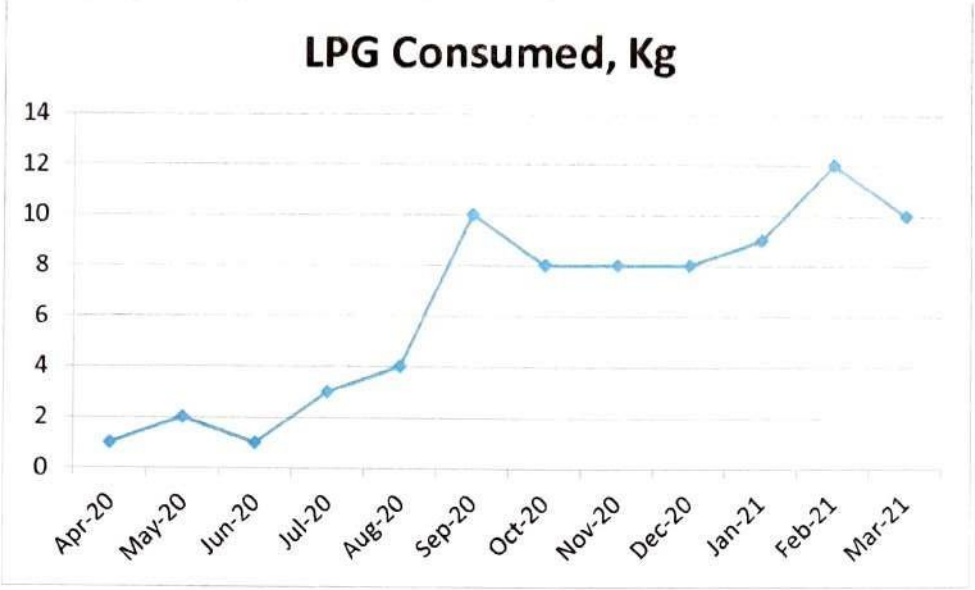

Table No 3: Key Parameters:

No	Parameter	Energy Purchased, kWh	LPG Consumed, Kg
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CHAPTER-III
STUDY OF CARBON FOOTPRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is:

- **1 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 Consumed, Kg	CO2 Emissions, MT
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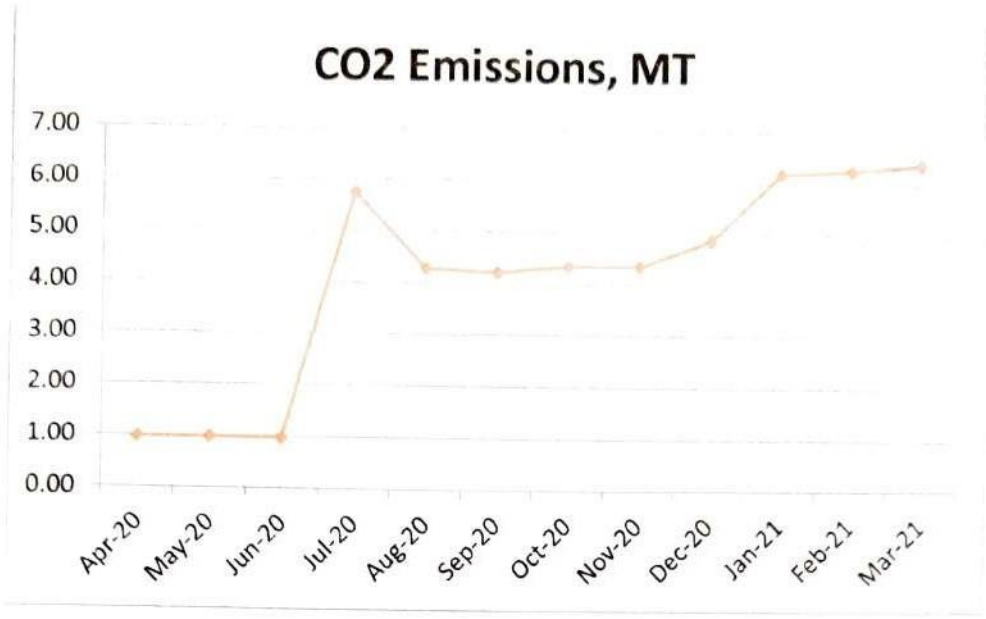
Chart No 3: Representation of Month wise CO_2 emissions:



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BACK TO SUMMARY

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

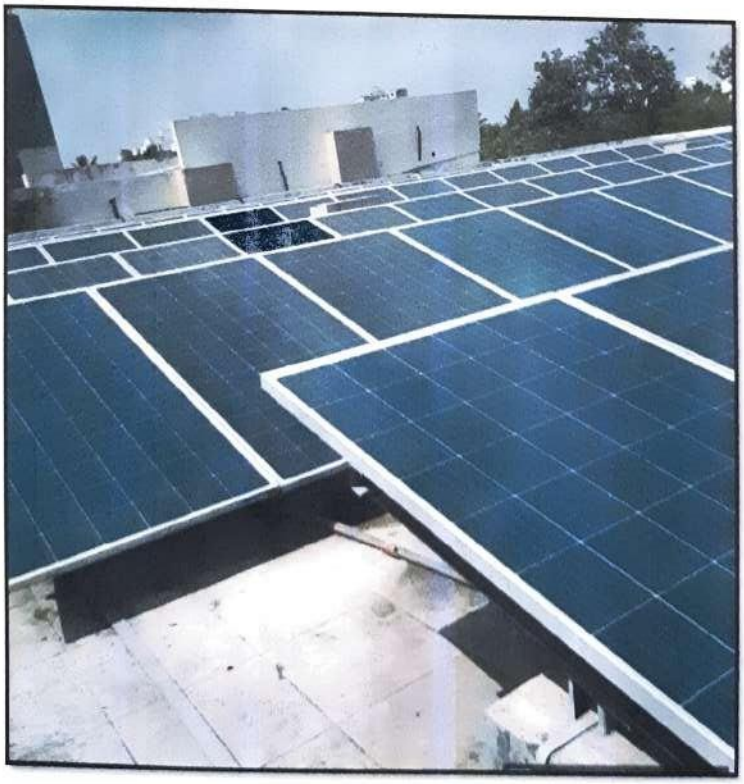
The College has installed a Roof Top Solar PV Plant of capacity **15.36 kWp.**

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	15.36	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**18432**	kWh
5	1 kWh of Electrical Energy emits	**0.9**	Kg of CO_2
6	Annual Reduction in CO2 Emissions = (4) * (5) /1000	**16.59**	MT

Photograph of Roof Top Solar PV Plant:



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CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The College has good housekeeping practices. The Waste is segregated at source. Waste collection Bins are placed at strategic locations.

Photograph of Waste Collection Bin:

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **100 KLPD.** The treated Water is used for Watering the internal Garden.

Photograph of Sewage Treatment Plant:

5.3 Bio Medical Waste Management:

The College has entered an MoU with PASCO, to dispose of the Bio Medical waste

BACK TO SUMMARY

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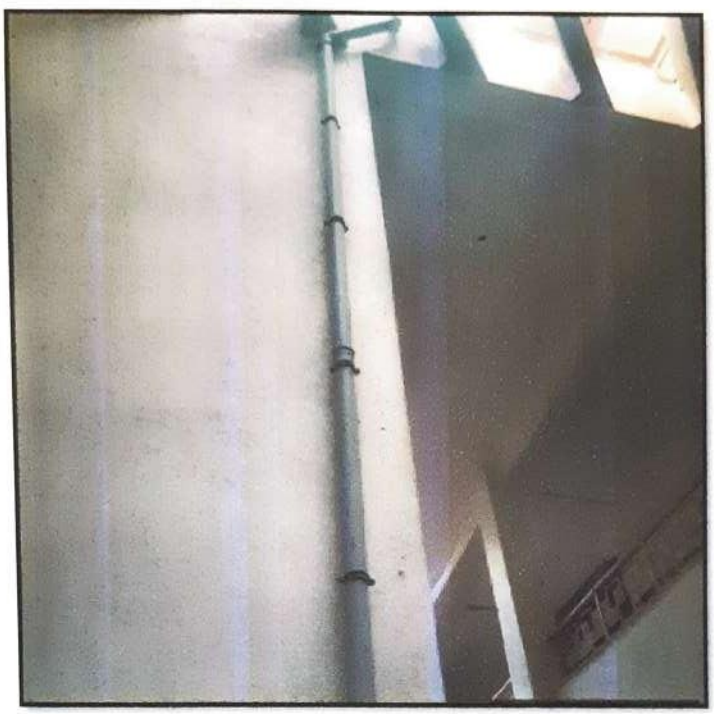
CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project; the Rain Water from the terrace is used to recharge the underground water table.

Photograph of Rain Water Carrying Pipe:



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BACK TO SUMMARY

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Internal Road:

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

Photograph of Internal Road & Tree Plantation:

7.2 Tree Plantation:

The College has well maintained lawn and Tree Plantation in the campus.

Photograph of Internal Tree Plantation:

Dr N S Vyawahare

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BACK TO SUMMARY

7.3 Provision of Ramp for Divyangajan:

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

Photograph of Ramp:

7.4 Creation of Awareness about Resource Conservation:

The College has displayed Posters on Importance of Water Conservation, appealing the stake holders to conserve the various Resources

Photograph of Posters on importance of Water Conservation:

Dr N S Vyawahare

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BACK TO SUMMARY

ENVIRONMENTAL AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

Year: 2020-21

Prepared by

ENRICH CONSULTANTS

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

Dr N S Vyawahare

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Date: 2023.06.15 12:10:27 +05'30'

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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***

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General Manager (EC)

Dr N S Vyawahare

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Date: 2023.06.15 12:10:59 +05'30'

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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/DYPCOP/20-21/03

Date: 19/7/2021

CERTIFICATE

This is to certify that we have conducted Environment Audit at Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2020-21.

The College has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
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- Segregation of Waste at source
- Installation of Sewage Treatment Plant
- Implementation of Rain Water Management Project
- Tree Plantation in the campus
- Creation of awareness about Water Conservation by Display of Posters

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

Dr N S Vyawahare

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Dr N S Vyawahare

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Environmental Audit of Akurdi campus for the Academic Year: 2020-21.

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

Dr N S Vyawahare

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EXECUTIVE SUMMARY

1. Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune consumes Energy in the form of Electrical Energy & LPG; used for various gadgets, Office & other facilities.

2. Pollution caused due to College Activities:

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

3. Present Energy, LPG Consumption & CO_2 Emissions:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	54796	76	49.52
2	Maximum	7102	12	6.42
3	Minimum	1075	1	0.97
4	Average	4566.33	6.33	4.13

4. Projects implemented for Environmental Conservation:

- Installation of 15.36 kWp Roof Top Solar PV Plant
- In campus Tree Plantation
- Installation of Sewage Treatment Plant

5. Usage of Renewable Energy& CO_2 Emission Reduction:

- The College has installed 15.36 kWp Roof Top Solar PV Plant.
- The Energy generated by Solar PV Plant in the Year: 20-21 is 18432 kWh.
- The reduction in CO_2 Emissions due to Solar PV Plant in 20-21 is 16.59 MT.

6. Indoor Air Quality:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	110	63	84
2	Minimum	95	57	73

7. Waste Management:

7.1 Segregation of Waste at Source:

The waste is segregated at the source. There are Waste Collection Bins at various locations, to collect the Waste.

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Dr N S Vyawahare

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7.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity 100 KLPD The treated Water is used for watering the Garden.

7.3 Bio Medical Waste Management:

The College has entered an MoU with PASCO, to dispose of the Bio Medical waste

8. Rain Water Management:

The College has installed Rain Water Management Project; the Rain Water from the terrace is used to recharge the underground water table.

9. Environment Friendly Initiatives:

- Tree Plantation and Well maintained Garden.
- Creation of Awareness in respect of Water Conservation by displaying posters

10. 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. Average Energy generated by 1 kWp Roof Top Solar PV System: 4 kWh
4. Annual Solar Energy Generation Days: 300 Nos

11. References:

- For CO_2 Emission computation: www.tatapower.com
- For Solar PV Energy Generation: www.solarrooftop.gov.in
- For AQI & Water Quality Standards: www.cpcb.com

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ABBREVIATIONS

kWh	:	kilo-Watt Hour
Qty	:	Quantity
MT	:	Metric Ton
CO_2	:	Carbon Di Oxide
kWp	:	Kilo Watt Peak
AQI	:	Air Quality Index
PM2.5	:	Particulate Matter of Size 2.5 microns
PM 10	:	Particulate Matter of Size 10 microns
CPCB	:	Central Pollution Control Board
ISHARE	:	The Indian Society of Heating & Refrigerating & Air Conditioning Engineers

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CHAPTER-I
INTRODUCTION

1.1. Important Definitions:

1.1.1Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.1.4. Relevant Environmental Laws in India: Table No-1:

1927	The Indian Forest Act
1972	The Wildlife Protection Act
1974	The Water (Prevention and Control of Pollution) Act
1977	The Water (Prevention & Control of Pollution) Cess Act
1980	The Forest (Conservation) Act
1981	The Air (Prevention and Control of Pollution) Act
1986	The Environment Protection Act
1991	The Public Liability Insurance Act
2002	The Biological Diversity Act
2010	The National Green Tribunal Act

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

1989	Hazardous Waste (Management and Handling) Rules
1989	Manufacture, Storage and Import of Hazardous Chemical Rules
2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Siting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules
2011	E-waste (Management and Handling) Rules

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2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research College)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency
10	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

1.2 Audit Methodology:

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

1.3 General Details of College: Table No: 4:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
2	Address	Dr. D. Y. Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	2002

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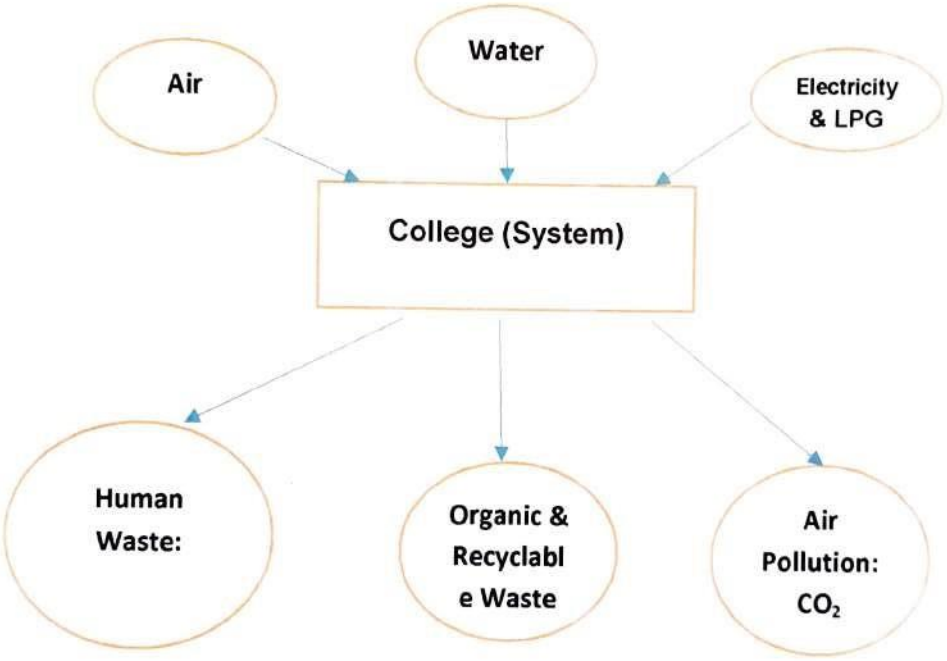
CHAPTER-II
STUDY OFRESOURCECONSUMPTION & CO_2 EMISSION

The College consumes following Natural/derived Resources:

1. Air
2. Water
3. Electrical Energy

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

Chart No 1: Representation of College as System:



A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. Here 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 basis of Calculation for CO_2 emissions due to Electrical Energy is:

- **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

Table No 5: Study of Energy, LPG Consumption & CO_2 Emission: 2020-21:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Apr-20	1075	1	0.97
2	May-20	1075	2	0.97
3	Jun-20	1075	1	0.97

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4	Jul-20	6354	3	5.73
5	Aug-20	4725	4	4.26
6	Sep-20	4639	10	4.20
7	Oct-20	4796	8	4.34
8	Nov-20	4802	8	4.34
9	Dec-20	5365	8	4.85
10	Jan-21	6852	9	6.19
11	Feb-21	6936	12	6.27
12	Mar-21	7102	10	6.42
13	Total	54796	76	49.52
14	Maximum	7102	12	6.42
15	Minimum	1075	1	0.97
16	Average	4566.33	6.33	4.13

Chart No 2: Representation of Month wise CO_2 emissions:

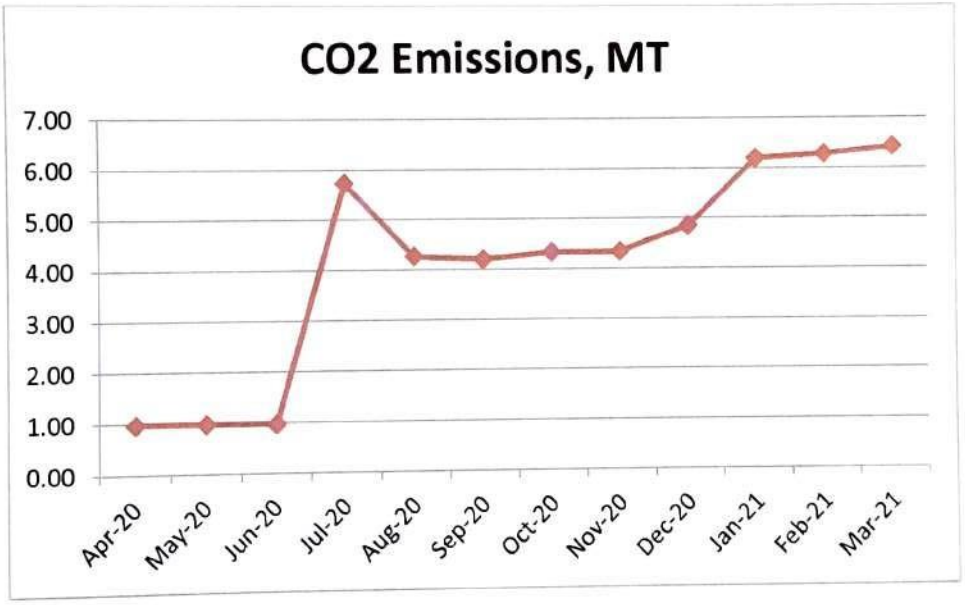

Table No 6: Key Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	54796	76	49.52
2	Maximum	7102	12	6.42
3	Minimum	1075	1	0.97
4	Average	4566.33	6.33	4.13

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CHAPTER-III
STUDY OF CO_2 EMISSION REDUCTION

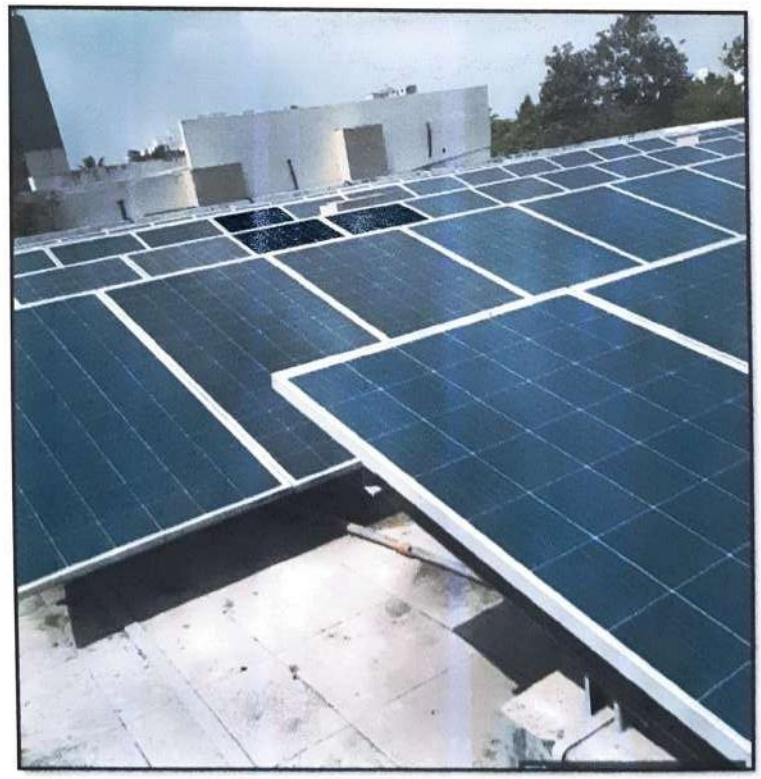
The College has installed a Roof Top Solar PV Plant of capacity **15.36 kWp.**

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

Table No 7: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	15.36	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**18432**	kWh
5	1 kWh of Electrical Energy emits	**0.9**	Kg of CO_2
6	Annual Reduction in CO2 Emissions = (4) * (5) /1000	**16.59**	MT

Photograph of Roof Top Solar PV Plant:



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CHAPTER IV
STUDY OF INDOOR AIR QUALITY

4.1 Importance of Air Quality:

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

By volume, Dry Air contains 78.09% Nitrogen, 20.95% Oxygen, 0.93% Argon, 0.039% carbon dioxide, and small amounts of other gases.

On average, a person inhales about **14,000 liters** of air every day. Therefore, poor air quality may affect the quality of life now and for future generations by affecting the health, the environment, the economy and the city's liveability.

Rapid urbanization and industrialization has added other elements/compounds to the pure air and thus caused the increase in pollution. In order to prevent, control and abate air pollution, the Air (Prevention and Control of Pollution) Act was enacted in 1981.

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

According to Section 2(b) of Air (Prevention and control of pollution) Act, 1981 '**air pollution**' has been defined as **'the presence in the atmosphere of any air pollutant.'**

As per Section 2(a) of Air (Prevention and control of pollution) Act, 1981 '**air pollutant**' has been defined as **'any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment**

4.2 Air Quality Index:

An **Air Quality Index (AQI)** is a number used by government agencies to measure the **air pollution** levels and communicate it to the population. As the AQI increases, it means that a large percentage of the population will experience severe adverse health effects. The measurement of the **AQI** requires an **air monitor** and an **air pollutant** concentration over a specified **averaging period**.

We present herewith following important Parameters.

1. AQI- Air Quality Index
2. PM 2.5- Particulate Matter of Size 2.5
3. PM 2.5- Particulate Matter of Size 2.5

Table No 8: Indoor Air Quality Parameters:

No	Location	AQI	PM-2.5	PM-10
	Ground Floor			
1	Library	96	58	73

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2	PG Lab-II	95	57	74
3	Faculty Room	100	60	76
	First Floor			
4	Class Room	106	62	82
5	Admin Office	103	61	84
6	Computer Lab	110	63	82
	Third Floor			
7	Class Room	106	62	82
8	Seminar Hall	106	62	82
	Maximum	**110**	**63**	**84**
	Minimum	**95**	**57**	**73**

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CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The College has good housekeeping practices. The Waste is segregated at source. Waste collection Bins are placed at strategic locations.

Photograph of Waste Collection Bin:

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **100 KLPD**. The treated Water is used for Watering the internal Garden.

Photograph of Sewage Treatment Plant:

5.3 Bio Medical Waste Management:

The College has entered an MoU with PASCO, to dispose of the Bio Medical waste

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CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project; the Rain Water from the terrace is used to recharge the underground water table.

Photograph of Rain Water Carrying Pipe:

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CHAPTER-VII
STUDY OF ENVIRONMENT FRIENDLY PRACTICES

7.1Tree Plantation in the Campus:

The College has landscaped Lawn and well maintained Tree Plantation in the campus.

Photograph of Tree Plantation:

7.2 Creation of Awareness about Water Conservation:

The College has displayed Posters on Importance of Water Conservation, appealing the stake holders to switch of the Equipment.

Photograph of Posters on importance of Water Conservation:

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ANNEXURE:
INDOOR AIR QUALITY STANDARDS:

1. Category Wise Air Quality Index Values & Concentration of PM 2.5 & PM10:

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

Dr N S Vyawahare

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Dr. D. Y. Patil Pratishthan's

Dr. D. Y. PATIL COLLEGE OF PHARMACY

Dr. D. Y. Patil Educational Complex, Sector - 29, Pradhikaran, Akurdi, Pune 411 044.
Tel. : 020-27656141, Tel. Fax : 020-27656141
E-mail : info@dyppharmaakurdi.ac.in Web : www.dyppharmaakurdi.ac.in
Approved by : All India Council for Techinical Education, New Delhi
Pharmacy Council of India, New Delhi. Recognized by : Government of Maharashtra
Affiliated to Savitribai Phule Pune University, Pune

Dr. Sanjay D. Patil
President

Padmashree Dr. D. Y. Patil
Founder

Shri. Satej D. Patil
Vce-President & Chairman

Dr. N. S. Vyawahare
Principal

Ref. No. : DYPCOP/
Date :

2019-20

Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy ★ Akurdi, Pune - 44.

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ENERGY AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

Year: 2019-20

Prepared by

ENRICH CONSULTANTS

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

ENRICH CONSULTANTS * PUNE *

Dr N S Vyawahare

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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: 020-26614393/26614403
Email: eee@mahaurja.com, Web: www.mahaurja.com

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

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

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

Name and Address of the firm	:	**Enrich Consultants** Yashashree, Plot No. 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Energy Conservation Programme*
Registration Number	:	***MEDA/ECN/CR-05/2018-19/EA-03***

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **31st March 2021** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

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

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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/DYPCOP/19-20/01

Date: 14/7/2020

CERTIFICATE

This is to certify that we have conducted Energy Audit at Dr. D. Y. Patil Pratishthan's, Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2019-20.

The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 15.36 kWp Roof Top Solar PV Plant.

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS PUNE

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ENRICH CONSULTANTS PUNE

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's Dr. D.Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Energy Audit of Akurdi campus for the Academic Year: 2019-20.

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

Dr N S Vyawahare

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EXECUTIVE SUMMARY

1. Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune consumes Energy in the form of Electrical Energy & LPG; used for various gadgets, Office & other facilities.

2. Present Energy, LPG Consumption & CO_2 Emissions:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	115692	228	104.73
2	Maximum	11123	38	10.06
3	Minimum	7936	10	7.24
4	Average	9641.00	19.00	8.73

3. Various Measures Adopted for Energy Conservation:

- Usage of Energy efficient LED fittings
- Usage of BEE STAR Rated Equipment
- Installation of 15.36 kWp Roof Top Solar PV Plant

4. Usage of Alternate / Renewable Energy:

- The College has installed 15.36 kWp Roof Top Solar PV Plant.
- The Energy purchased from MSEDCL in 2019-20 is 115692 kWh
- Energy generated by Solar PV Plant is 18432 kWh
- Total Annual Energy Demand of the College is 134124 kWh
- The percentage of Alternate Energy to Annual Energy Demand is 13.74 %.

5. Usage of LED Lighting:

- The Total LED Lighting Load is 4.47 kW.
- The Total Lighting Load is 17.245 kW.
- The % of LEDs to Total Lighting Load is 26%.

6. 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. Average Energy generated by 1 kWp Roof Top Solar PV System: 4 kWh
4. Annual Solar Energy Generation Days: 300 Nos

7. References:

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

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ABBREVIATIONS

AC	:	Air conditioner
MCA	:	Master in Computer Applications
LED	:	Light Emitting Diode
PL	:	Pin Type Light Fitting
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
D/L	:	Down Lighter
PC	:	Personal Computer
MT	:	Metric Ton

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CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study Connected Load
2. To study present level of Energy Consumption
3. To Study the present CO_2 emissions
4. To study Usage of Renewable Energy
5. To study usage of LED Lights

1.2 Table No1: General Details of College:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
2	Address	Dr. D. Y. Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	2002

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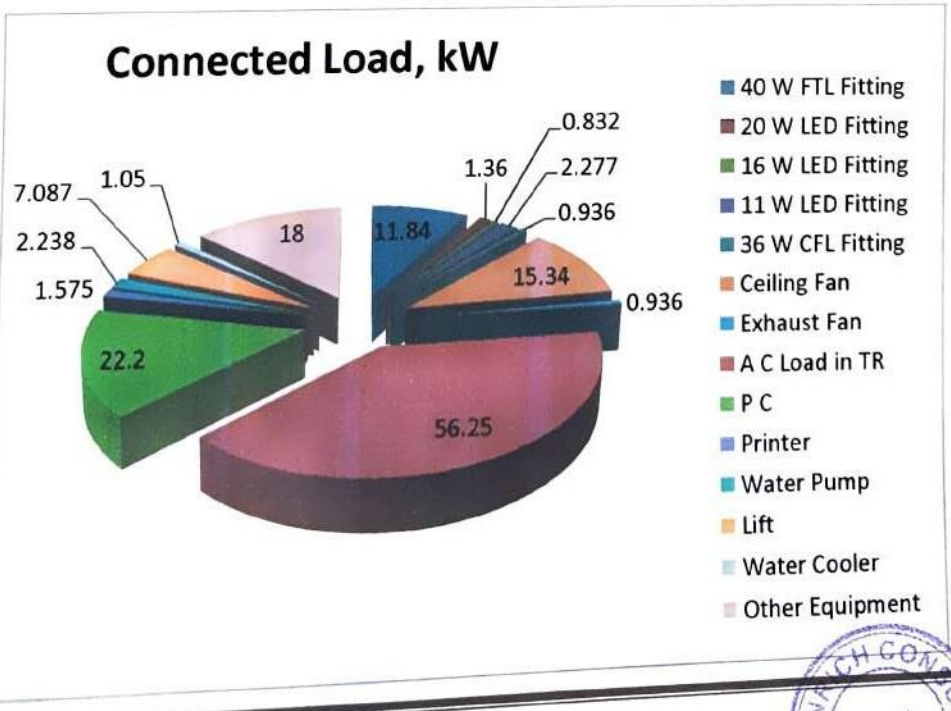
CHAPTER-II
STUDY OF CONNECTED LOAD

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

Table No-2: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	40 W FTL Fitting	296	40	11.84
2	20 W LED Fitting	68	20	1.36
3	16 W LED Fitting	52	16	0.832
4	11 W LED Fitting	207	11	2.277
5	36 W CFL Fitting	26	36	0.936
6	Ceiling Fan	236	65	15.34
7	Exhaust Fan	18	52	0.936
8	A C Load in TR	45	1250	56.25
9	P C	148	150	22.2
10	Printer	9	175	1.575
11	Water Pump	1	2238	2.238
12	Lift	1	7087	7.087
13	Water Cooler	3	350	1.05
14	Other Equipment	120	150	18
15	**Total**			**142**

Chart No-1: Details of Connected Load:



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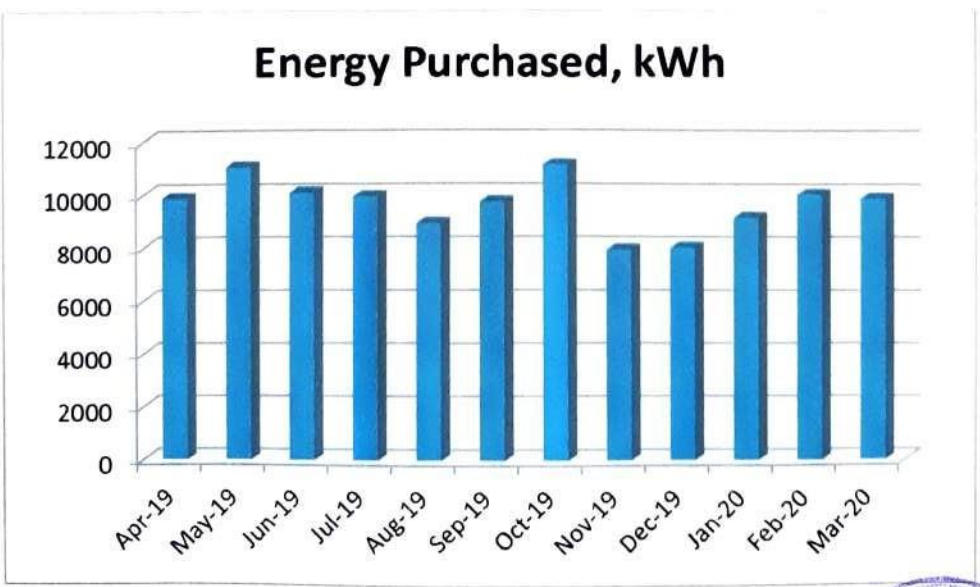
CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 3: Electrical Energy & LPG Consumption Analysis- 2019-20:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg
1	Apr-19	9863	10
2	May-19	11036	11
3	Jun-19	10085	12
4	Jul-19	9936	16
5	Aug-19	8935	24
6	Sep-19	9725	38
7	Oct-19	11123	19
8	Nov-19	7936	38
9	Dec-19	8012	11
10	Jan-20	9145	11
11	Feb-20	10021	19
12	Mar-20	9875	19
13	Total	115692	228
14	Maximum	11123	38
15	Minimum	7936	10
16	Average	9641.00	19.00

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



BACK TO SUMMARY

Dr N S Vyawahare
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Chart No 3: To study the variation of Month wise LPG Consumption, Kg:

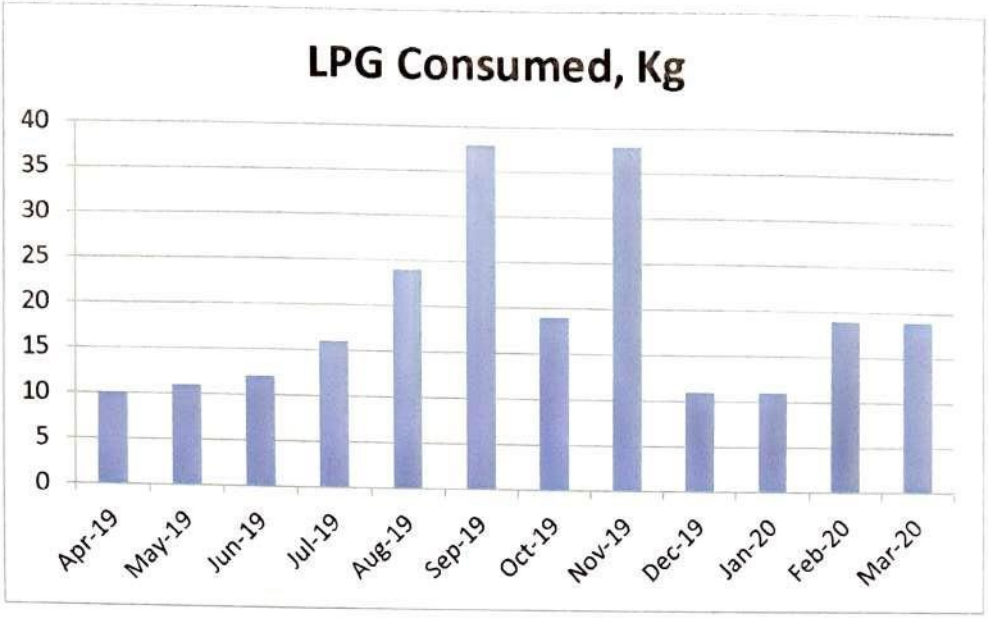

Table No 4: Key Parameters:

No	Parameter	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	115692	228
2	Maximum	11123	38
3	Minimum	7936	10
4	Average	9641.00	19.00

Dr N S Vyawahare

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BACK TO SUMMARY

CHAPTER-IV
STUDY OF CARBON FOOT PRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is:

- **1 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 5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Apr-19	9863	10	8.90
2	May-19	11036	11	9.96
3	Jun-19	10085	12	9.11
4	Jul-19	9936	16	8.99
5	Aug-19	8935	24	8.11
6	Sep-19	9725	38	8.85
7	Oct-19	11123	19	10.06
8	Nov-19	7936	38	7.24
9	Dec-19	8012	11	7.24
10	Jan-20	9145	11	8.26
11	Feb-20	10021	19	9.07
12	Mar-20	9875	19	8.94
13	Total	115692	228	104.73
14	Maximum	11123	38	10.06
15	Minimum	7936	10	7.24
16	Average	9641.00	19.00	8.73

BACK TO SUMMARY

Dr N S Vyawahare

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Chart No 4: Representation of Month wise CO_2 emissions:

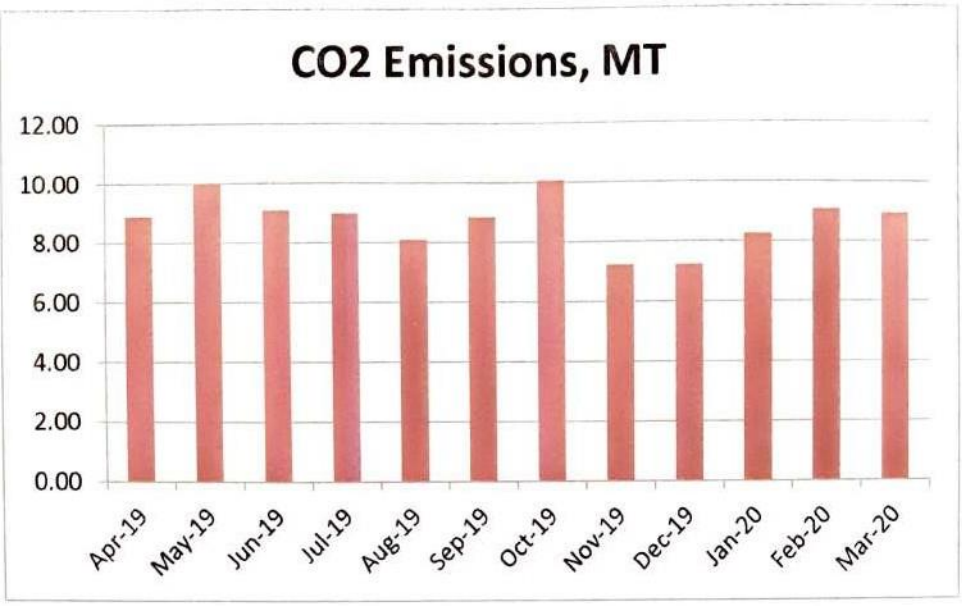

Table No 6: Key Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	115692	228	104.73
2	Maximum	11123	38	10.06
3	Minimum	7936	10	7.24
4	Average	9641.00	19.00	8.73

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BACK TO SUMMARY

CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

The College has installed **15.36 kWp** Roof Top Solar PV Plant.

In this Chapter, we compute the percentage of usage of Alternate / Renewable Energy to Annual Energy Demand of the College.

Table No 7: Computation of % usage of Alternate Energy to Annual Energy Demand:

No	Particulars	Value	Unit
1	Energy Purchased from MSEDCL	**115692**	kWh
2	Installed Roof Top Solar PV Plant Capacity	15.36	kWp
3	Average Daily Energy Generated	4	kWh/kWp
4	Annual Generation Days	300	Nos
5	Annual Solar Energy Generated	**18432**	kWh
6	Total Energy Demand = (1) + (5)	134124	kWh
7	% of Usage of Alternate Energy to Total Energy Demand= (5)*100/ (6)	**13.74**	%

Photograph of Roof Top Solar PV Plant:

Dr N S Vyawahare

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BACK TO SUMMARY

CHAPTER VI
STUDY OF USAGE OF LED LIGHTS

In the following Table, we present the percentage of Total Lighting load met by LEDs.

Table No 8: Computation of Percent Usage of LED Usage to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	296	Nos
2	Demand of 40 W FTL Fitting	40	W/Unit
3	Total Electrical Load of 40 W FTL Fittings	**11.84**	kW
4	No of 20 W LED Tube Lights	68	Nos
5	Demand of 20 W LED Tube Light	20	W/Unit
6	Total Electrical Load of 20 W LED Fittings	**1.36**	kW
7	No of 16 W Panel LED Fittings	52	Nos
8	Demand of 16 W Panel LED Fittings	16	W/Unit
9	Total Electrical Load of 16 W Panel LED Fittings	**0.83**	kW
10	No of 11 W LED Fittings	207	Nos
11	Demand of 11 W LED Fittings	11	W/Unit
12	Total Electrical Load of 11 W LED Fittings	**2.277**	kW
13	No of PL Type 36 W CFL Fittings	26	Nos
14	Demand of PL Type 36 W CFL Fittings	36	W/Unit
15	Total Electrical Load of PL Type 36 W CFL Fittings	**0.936**	kW
16	Total LED Lighting Load= 6+9+12	**4.47**	kW
17	Total Lighting Load=3+6+9+12+15	**17.245**	kW
18	**Lighting Requirement met by LEDs = 16*100/17**	**26**	%

Dr N S Vyawahare

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BACK TO SUMMARY

GREEN AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

Year: 2019-20

Prepared by

ENRICH CONSULTANTS

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

ENRICH CONSULTANTS PUNE

Dr N S Vyawahare

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BACK TO SUMMARY

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency

(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Irilal Nagar, Yerwada, Pune 411 006.
Ph No. 020-26614393/26614403
Email: eee@mahaurja.com, Web: www.mahaurja.com

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

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

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

Name and Address of the firm	:	**Enrich Consultants** Yashashree, Plot No. 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Energy Conservation Programme*
Registration Number	:	***MEDA/ECN/CR-05/2018-19/EA-03***

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **31st March 2021** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

19/9/18

(Smita Kudarikar)
General Manager (EC)

Dr N S Vyawahare — Digitally signed by Dr N S Vyawahare, Date: 2023.06.15 12:45:07 +05'30'

BACK TO SUMMARY

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/DYPCOP/19-20/02

Date: 14/7/2020

CERTIFICATE

This is to certify that we have conducted Green Audit at Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2019-20.

The College has adopted following Energy Efficient & Green practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 15.36 kWp Roof Top Solar PV Plant.
- Segregation of Waste at source
- Installation of Sewage Treatment Plant
- Implementation of Rain Water Management Project
- Good Internal Road
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of awareness about 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 Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS PUNE

Dr N S Vyawahare

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Date: 2023.06.15 12:45:48 +05'30'

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Dr N S Vyawahare

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Green Audit of Akurdi campus for the Academic Year: 2019-20.

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

Dr N S Vyawahare

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Date: 2023.06.15 12:47:11 +05'30'

BACK TO SUMMARY

EXECUTIVE SUMMARY

1. Dr. D Y Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune consumes Energy in the form of Electrical Energy& LPG; used for various gadgets, Office & other facilities.

2. Present Energy, LPG Consumption & CO_2 Emissions:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	115692	228	104.73
2	Maximum	11123	38	10.06
3	Minimum	7936	10	7.24
4	Average	9641.00	19.00	8.73

3. Various Majors Adopted for Energy Conservation:

- Usage of Energy Efficient LED Fittings
- Usage of Energy efficient STAR Rated Equipment
- Installation of 15.36 kWp Roof Top Solar PV Plant

4. Usage of Renewable Energy & CO_2 Emission Reduction:

- The College has installed 15.36 kWp Roof Top Solar PV Plant.
- The Energy generated by Solar PV Plant in the Year: 19-20 is 18432 kWh.
- The reduction in CO_2 Emissions due to Solar PV Plant in 19-20 is 16.59 MT.

5. Waste Management:

5. Waste Management:

5.1 Segregation of Waste at Source:

The waste is segregated at the source. There are Waste Collection Bins at various locations, to collect the Waste.

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity 100 KLPD. The treated Water is used for watering the Garden.

5.3 Bio Medical Waste Management:

The College has entered an MoU with PASCO, to dispose of the Bio Medical waste

6. Rain Water Management:

The College has installed Rain Water Management Project; the Rain Water from the terrace is used to recharge the underground water table.

Dr N S Vyawahare Digitally signed by Dr N S Vyawahare Date: 2023.06.15 12:47:53 +05'30'

BACK TO SUMMARY

7. Green & Sustainable Practices:

- Well maintained internal road
- Well maintained Garden.
- Provision of Ramp for Divyangajan

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. Average Energy generated by 1 kWp Roof Top Solar PV System: 4 kWh
4. Annual Solar Energy Generation Days: 300 Nos

9. References:

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

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BACK TO SUMMARY

ABBREVIATIONS

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

Dr N S Vyawahare

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BACK TO SUMMARY

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
2	Address	Dr. D Y Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	2002

Dr N S Vyawahare

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BACK TO SUMMARY

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Study of Energy, LPG Consumption Analysis- 2019-20:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg
1	Apr-19	9863	10
2	May-19	11036	11
3	Jun-19	10085	12
4	Jul-19	9936	16
5	Aug-19	8935	24
6	Sep-19	9725	38
7	Oct-19	11123	19
8	Nov-19	7936	38
9	Dec-19	8012	11
10	Jan-20	9145	11
11	Feb-20	10021	19
12	Mar-20	9875	19
13	Total	115692	228
14	Maximum	11123	38
15	Minimum	7936	10
16	Average	9641.00	19.00

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

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Dr N S Vyawahare

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Chart No 2: To study the variation of Month wise LPG Consumption, Kg:

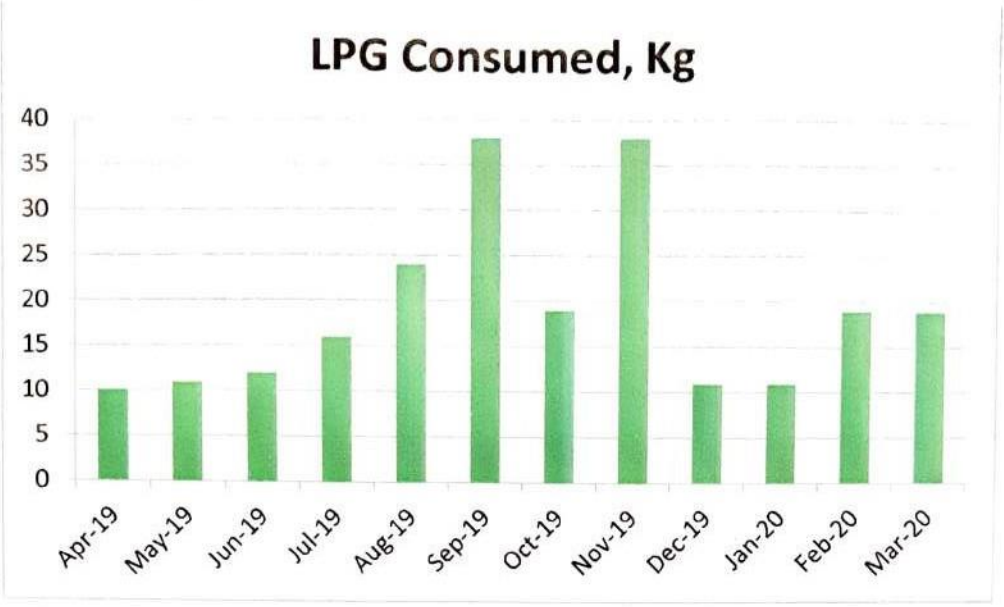

Table No 3: Key Parameters:

No	Parameter	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	115692	228
2	Maximum	11123	38
3	Minimum	7936	10
4	Average	9641.00	19.00

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CHAPTER-III
STUDY OF CARBON FOOTPRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is:

- **1 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 Consumed, Kg	CO2 Emissions, MT
1	Apr-19	9863	10	8.90
2	May-19	11036	11	9.96
3	Jun-19	10085	12	9.11
4	Jul-19	9936	16	8.99
5	Aug-19	8935	24	8.11
6	Sep-19	9725	38	8.85
7	Oct-19	11123	19	10.06
8	Nov-19	7936	38	7.24
9	Dec-19	8012	11	7.24
10	Jan-20	9145	11	8.26
11	Feb-20	10021	19	9.07
12	Mar-20	9875	19	8.94
13	Total	115692	228	104.73
14	Maximum	11123	38	10.06
15	Minimum	7936	10	7.24
16	Average	9641.00	19.00	8.73

BACK TO SUMMARY

Dr N S Vyawahare

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Chart No 2: Representation of Month wise CO_2 emissions:

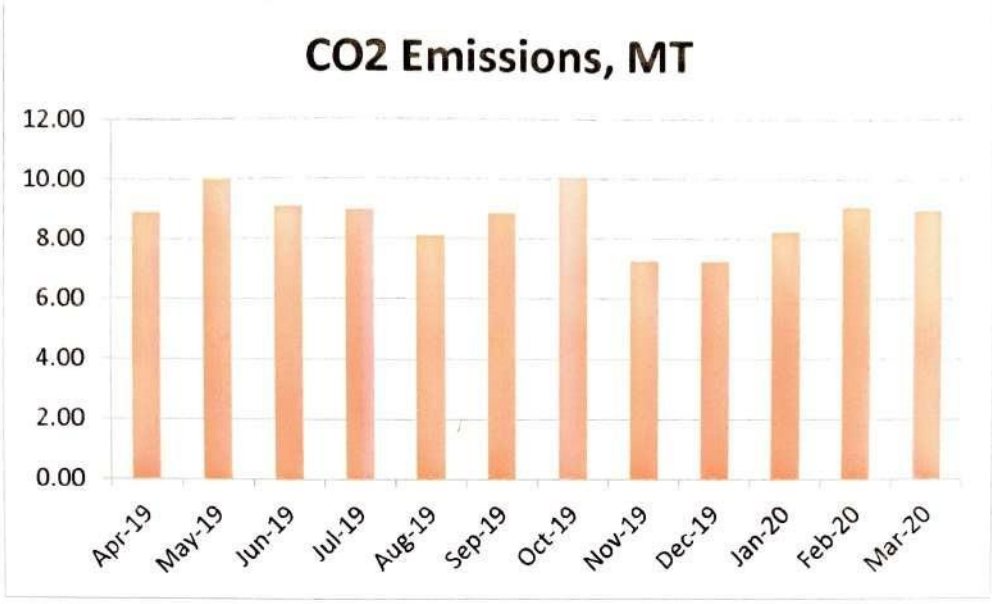

Table No 5: Key Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
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2	Maximum	11123	38	10.06
3	Minimum	7936	10	7.24
4	Average	9641.00	19.00	8.73

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BACK TO SUMMARY

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed a Roof Top Solar PV Plant of capacity **15.36 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	15.36	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**18432**	kWh
5	1 kWh of Electrical Energy emits	**0.9**	Kg of CO_2
6	Annual Reduction in CO_2 Emissions = (4) * (5) /1000	**16.59**	MT

Photograph of Roof Top Solar PV Plant:

Dr N S Vyawahare

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BACK TO SUMMARY

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

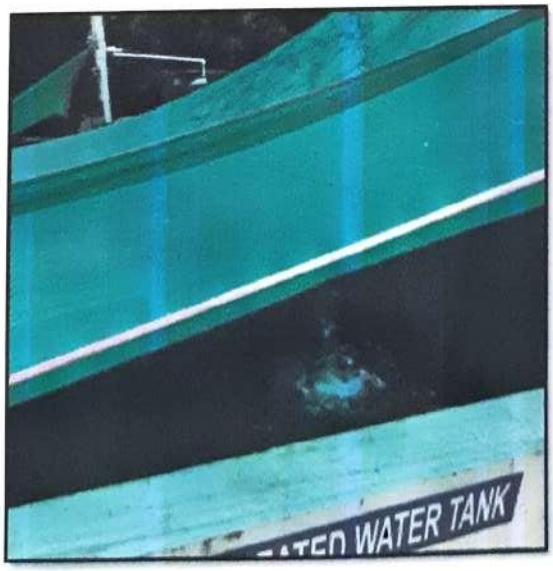
The College has good housekeeping practices. The Waste is segregated at source. Waste collection Bins are placed at strategic locations.

Photograph of Waste Collection Bin:

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **100 KLPD.** The treated Water is used for Watering the internal Garden.

Photograph of Sewage Treatment Plant:



5.3 Bio Medical Waste Management:

The College has entered an MoU with PASCO, to dispose of the Bio Medical waste

BACK TO SUMMARY

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CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project, the Rain Water from the terrace is used to recharge the underground water table.

Photograph of Rain Water Carrying Pipe:

Dr N S Vyawahare

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BACK TO SUMMARY

CHAPTER-VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Internal Road:

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

Photograph of Internal Road:

7.2 Tree Plantation:

The College has well maintained lawn and Tree Plantation in the campus.

Photograph of Internal Tree Plantation:

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7.3 Provision of Ramp for Divyangajan:

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

Photograph of Ramp:

BACK TO SUMMARY

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ENVIRONMENTAL AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

Year: 2019-20

Prepared by

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society,
Near Muktangan English School, Parvati, Pune 411009
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Dr N S Vyawahare

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Date: 2023.06.15 13:01:46 +05'30'

BACK TO SUMMARY

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 (Soc) 020-26614393/26614403
E mail: eee@mahaurja.com, Web: www.mahaurja.com

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

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

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

Name and Address of the firm	:	**Enrich Consultants** Yashashree, Plot No. 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Energy Conservation Programme*
Registration Number	:	***MEDA/ECN/CR-05/2018-19/EA-03***

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **31st March 2021** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

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

Dr N S Vyawahare
Digitally signed by Dr N S Vyawahare
Date: 2023.06.15 13:02:30 +05'30'

BACK TO SUMMARY

Enrich Consultants

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

Ref: EC/DYPCOP/19-20/03

Date: 14/7/2020

CERTIFICATE

This is to certify that we have conducted Environment Audit at Dr. D. Y. Patil Pratishthan's, Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2019-20.

The College has adopted following Environment Friendly Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 15.36 kWp Roof Top Solar PV Plant.
- Segregation of Waste at source
- Installation of Sewage Treatment Plant
- Implementation of Rain Water Management Project
- Tree Plantation in the campus
- Creation of awareness about Energy Conservation by Display of Posters

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS * PUNE *

BACK TO SUMMARY

Dr N S Vyawahare

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Dr N S Vyawahare

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Environmental Audit of Akurdi campus for the Academic Year: 2019-20.

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

Dr N S Vyawahare

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EXECUTIVE SUMMARY

1. Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune consumes Energy in the form of Electrical Energy; used for various gadgets, Office & other facilities.

2. Pollution caused due to College Activities:

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

3 . Present Energy, LPG Consumption & CO_2 Emissions:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	115692	228	104.73
2	Maximum	11123	38	10.06
3	Minimum	7936	10	7.24
4	Average	9641.00	19.00	8.73

4. Projects implemented for Environmental Conservation:

- Installation of 15.36 kWp Roof Top Solar PV Plant
- In campus Tree Plantation
- Installation of Sewage Treatment Plant

5. Usage of Renewable Energy & CO_2 Emission Reduction:

- The College has installed 15.36 kWp Roof Top Solar PV Plant.
- The Energy generated by Solar PV Plant in the Year: 19-20 is 18432 kWh.
- The reduction in CO_2 Emissions due to Solar PV Plant in 19-20 is 16.59 MT.

6. Waste Management:

6.1 Segregation of Waste at Source:

The waste is segregated at the source. There are Waste Collection Bins at various locations, to collect the Waste.

6.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity 100 KLPD. The treated Water is used for watering the Garden.

6.3 Bio Medical Waste Management:

The College has entered an MoU with PASCO, to dispose of the Bio Medical waste

Dr N S Vyawahare
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7. Rain Water Management:

The College has installed Rain Water Management Project; the Rain Water from the terrace is used to recharge the underground water table.

8. Environment Friendly Initiatives:

- Tree Plantation and Well maintained Garden.

9. Notes & 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. Average Energy generated by 1 kWp Roof Top Solar PV System: 4 kWh
4. Annual Solar Energy Generation Days: 300 Nos

10. References:

- For CO_2 Emission computation: www.tatapower.com
- For Solar PV Energy Generation: www.solarrooftop.gov.in

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Dr N S Vyawahare

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ABBREVIATIONS

kWh	:	kilo-Watt Hour
Qty	:	Quantity
MT	:	Metric Ton
CO_2	:	Carbon Di Oxide
kWp	:	Kilo Watt Peak
AQI	:	Air Quality Index
PM2.5	:	Particulate Matter of Size 2.5 microns
PM 10	:	Particulate Matter of Size 10 microns
CPCB	:	Central Pollution Control Board
ISHARE	:	The Indian Society of Heating & Refrigerating & Air Conditioning Engineers

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CHAPTER-I
INTRODUCTION

1.1. Important Definitions:

1.1.1Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.1.3. Environmental Pollutant: means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.1.4. Relevant Environmental Laws in India: Table No-1:

1927	The Indian Forest Act
1972	The Wildlife Protection Act
1974	The Water (Prevention and Control of Pollution) Act
1977	The Water (Prevention & Control of Pollution) Cess Act
1980	The Forest (Conservation) Act
1981	The Air (Prevention and Control of Pollution) Act
1986	The Environment Protection Act
1991	The Public Liability Insurance Act
2002	The Biological Diversity Act
2010	The National Green Tribunal Act

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

1989	Hazardous Waste (Management and Handling) Rules
1989	Manufacture, Storage and Import of Hazardous Chemical Rules
2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Siting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules
2011	E-waste (Management and Handling) Rules

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2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research College)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency
10	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

1.2 Audit Methodology:

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

1.3 General Details of College: Table No: 4:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
2	Address	Dr. D. Y. Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	2002

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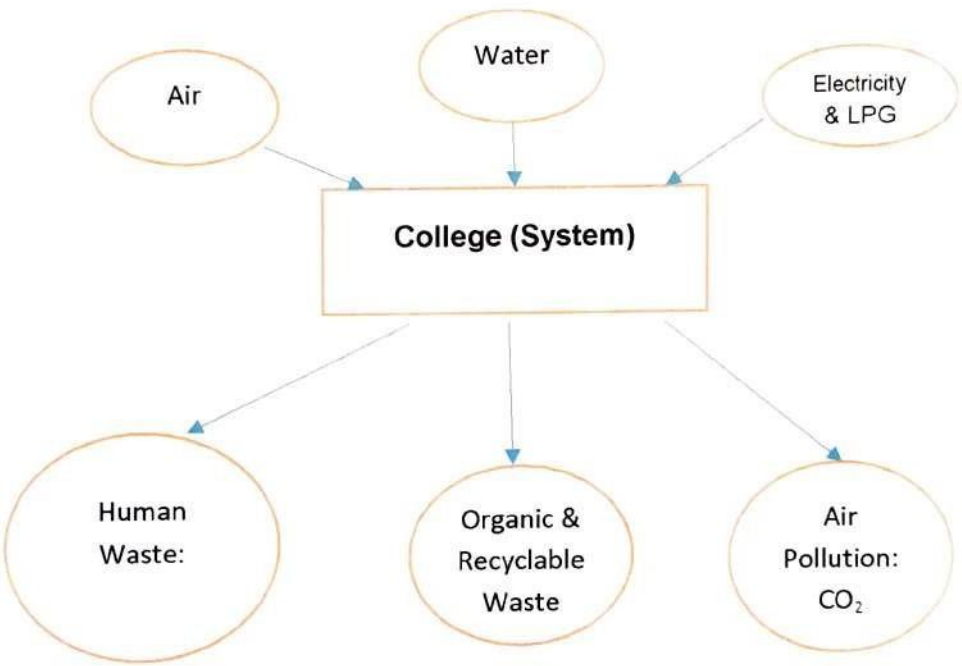
CHAPTER-II
STUDY OF RESOURCE CONSUMPTION & CO_2 EMISSION

The College consumes following Natural/derived Resources:

1. Air
2. Water
3. Electrical Energy

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

Chart No 1: Representation of College as System:



A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities. Here 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 basis of Calculation for CO_2 emissions due to Electrical Energy is:

- **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

Table No 5: Study of Energy, LPG Consumption & CO_2 Emission: 2019-20:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Apr-19	9863	10	8.90
2	May-19	11036	11	9.96
3	Jun-19	10085	12	9.11

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4	Jul-19	9936	16	8.99
5	Aug-19	8935	24	8.11
6	Sep-19	9725	38	8.85
7	Oct-19	11123	19	10.06
8	Nov-19	7936	38	7.24
9	Dec-19	8012	11	7.24
10	Jan-20	9145	11	8.26
11	Feb-20	10021	19	9.07
12	Mar-20	9875	19	8.94
13	Total	115692	228	104.73
14	Maximum	11123	38	10.06
15	Minimum	7936	10	7.24
16	Average	9641.00	19.00	8.73

Chart No 2: Representation of Month wise CO_2 emissions:

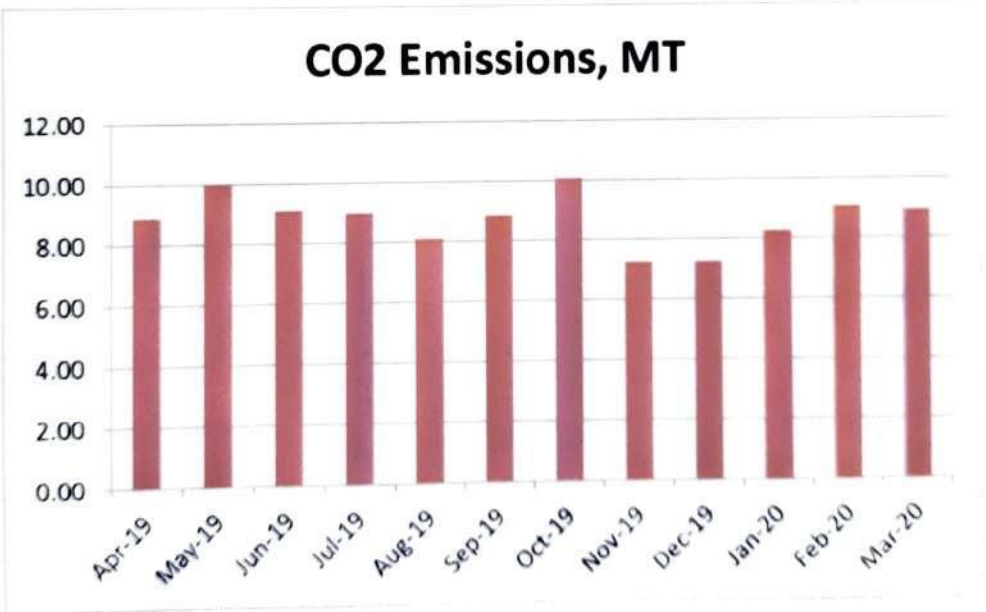

Table No 6: Key Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	115692	228	104.73
2	Maximum	11123	38	10.06
3	Minimum	7936	10	7.24
4	Average	9641.00	19.00	8.73

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CHAPTER-III
STUDY OF CO_2 EMISSION REDUCTION

The College has installed a Roof Top Solar PV Plant of capacity **15.36 kWp.**

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

Table No 7: Computation of Annual Reduction in CO_2 Emissions:

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	15.36	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	**18432**	kWh
5	1 kWh of Electrical Energy emits	**0.9**	Kg of CO_2
6	Annual Reduction in CO2 Emissions = (4) * (5) /1000	**16.59**	MT

Photograph of Roof Top Solar PV Plant:

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CHAPTER IV
STUDY OF WASTE MANAGEMENT

4.1 Segregation of Waste at Source:

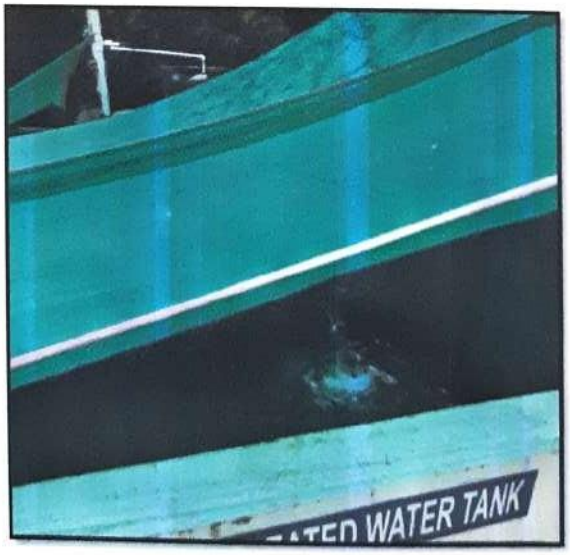
The College has good housekeeping practices. The Waste is segregated at source. Waste collection Bins are placed at strategic locations.

Photograph of Waste Collection Bin:

4.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **100 KLPD.** The treated Water is used for Watering the internal Garden.

Photograph of Sewage Treatment Plant:



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4.3 Bio Medical Waste Management:

The College has entered an MoU with PASCO, to dispose of the Bio Medical waste

CHAPTER-V
STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project; the Rain Water from the terrace is used to recharge the underground water table.

Photograph of Rain Water Carrying Pipe:

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CHAPTER-VI
STUDY OF ENVIRONMENT FRIENDLY PRACTICES

6.1Tree Plantation in the Campus:

The College has landscaped Lawn and well maintained Tree Plantation in the campus.

Photograph of Tree Plantation:

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Dr. D. Y. Patil Pratishthan's
Dr. D. Y. PATIL COLLEGE OF PHARMACY
Dr. D. Y. Patil Educational Complex, Sector - 29, Pradhikaran, Akurdi, Pune 411 044.
Tel. : 020-27656141, Tel. Fax : 020-27656141
E-mail : info@dyppharmaakurdi.ac.in Web : www.dyppharmaakurdi.ac.in
Approved by : All India Council for Techinical Education, New Delhi
Pharmacy Council of India, New Delhi. Recognized by : Government of Maharashtra
Affiliated to Savitribai Phule Pune University, Pune

Dr. Sanjay D. Patil
President

Padmashree Dr. D. Y. Patil
Founder

Shri. Satej D. Patil
Vce-President & Chairman

Dr. N. S. Vyawahare
Principal

Ref. No. : DYPCOP/
Date :

2018-19

Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy ★ Akurdi, Pune - 44.

Dr N S Vyawahare

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ENERGY AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

Year: 2018-19

Prepared by

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society,

Near Muktangan English School, Parvati, Pune 411009

Phone: 09890444795 Email: enrichcons@gmail.com

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ENRICH CONSULTANTS PUNE

Dr N S Vyawahare

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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: 020-26614393/26614403
Email: eee@mahaurja.com, Web: www.mahaurja.com

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

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

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

Name and Address of the firm	:	**Enrich Consultants** Yashashree, Plot No. 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Energy Conservation Programme*
Registration Number	:	***MEDA/ECN/CR-05/2018-19/EA-03***

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **31st March 2021** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

19/9/18

(Smita Kudarikar)
General Manager (I/C)

Dr N S Vyawahare
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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/DYPCOP/18-19/01 Date: 1/7/2019

CERTIFICATE

This is to certify that we have conducted Energy Audit at Dr. D. Y. Patil Pratishthan's, Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2018-19.

The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

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Dr N S Vyawahare

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's Dr. D.Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Energy Audit of Akurdi campus for the Academic Year: 2018-19.

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

Dr N S Vyawahare

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BACK TO SUMMARY

EXECUTIVE SUMMARY

1. Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune consumes Energy in the form of **Electrical Energy & LPG**; used for various gadgets, Office & other facilities.

2. Present Energy Consumption:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	110577	247	89.12
2	Maximum	10052	38	8.14
3	Minimum	7996	12	6.44
4	Average	9214.75	20.58	7.43

3. Various Measures Adopted for Energy Conservation:

- Usage of Energy efficient LED fittings
- Usage of BEE STAR Rated Equipment

4. Usage of Renewable Energy:

The College is in process of installation of Roof Top Solar PV Plant of Capacity **15.36 kWp.**

5. Usage of LED Lighting:

- The Total LED Lighting Load is **4.10 kW.**
- The Total Lighting Load is **17.442 kW.**
- The % of LEDs to Total Lighting Load is **23 %.**

6. 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

Dr N S Vyawahare

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ABBREVIATIONS

AC	:	Air conditioner
LED	:	Light Emitting Diode
PL	:	Pin Type Light Fitting
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
D/L	:	Down Lighter
PC	:	Personal Computer
MT	:	Metric Ton

Dr N S Vyawahare

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CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study Connected Load
2. To study present level of Energy Consumption
3. To Study the present CO_2 emissions
4. To study Usage of Renewable Energy
5. To study usage of LED Lights

1.2 Table No1: General Details of College:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D.Y. Patil College of Pharmacy
2	Address	Dr. D. Y. Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	2002

Dr N S Vyawahare

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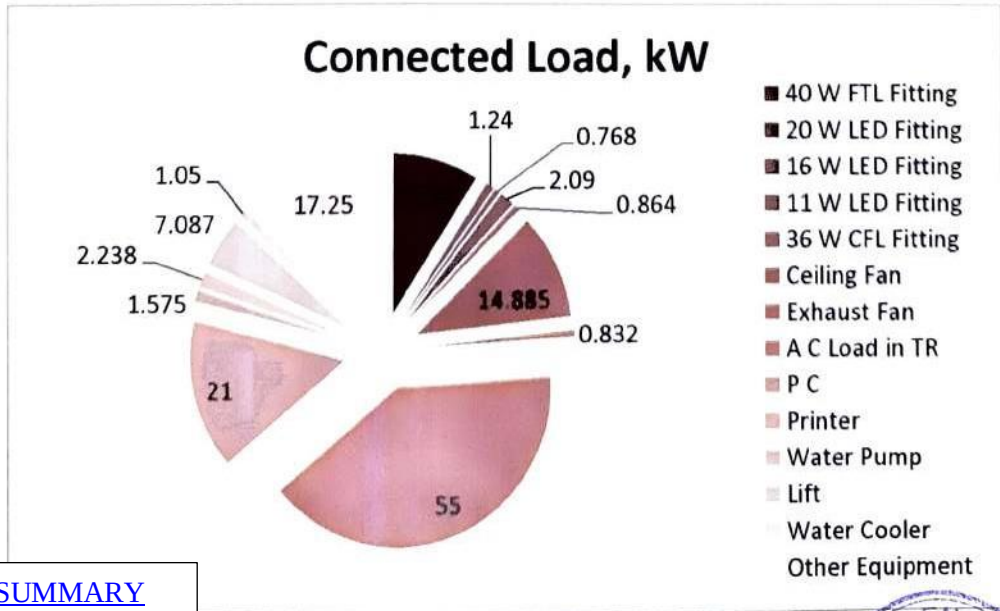
CHAPTER-II
STUDY OF CONNECTED LOAD

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

Table No-2: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	40 W FTL Fitting	312	40	12.48
2	20 W LED Fitting	62	20	1.24
3	16 W LED Fitting	48	16	0.768
4	11 W LED Fitting	190	11	2.09
5	36 W CFL Fitting	24	36	0.864
6	Ceiling Fan	229	65	14.885
7	Exhaust Fan	16	52	0.832
8	A C Load in TR	44	1250	55
9	P C	140	150	21
10	Printer	9	175	1.575
11	Water Pump	1	2238	2.238
12	Lift	1	7087	7.087
13	Water Cooler	3	350	1.05
14	Other Equipment	115	150	17.25
15	**Total**			**138**

Chart No-1: Details of Connected Load:



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CHAPTER-III
STUDY OF ELECTRICAL ENERGY CONSUMPTION

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

Table No 3: Electrical Energy & LPG Consumption Analysis- 2018-19:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg
1	Apr-18	9368	12
2	May-18	10015	12
3	Jun-18	9652	13
4	Jul-18	9875	14
5	Aug-18	8935	16
6	Sep-18	7996	28
7	Oct-18	8936	24
8	Nov-18	10052	38
9	Dec-18	9685	19
10	Jan-19	9125	19
11	Feb-19	8936	38
12	Mar-19	8002	14
13	Total	110577	247
14	Maximum	10052	38
15	Minimum	7996	12
16	Average	9214.75	20.58

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

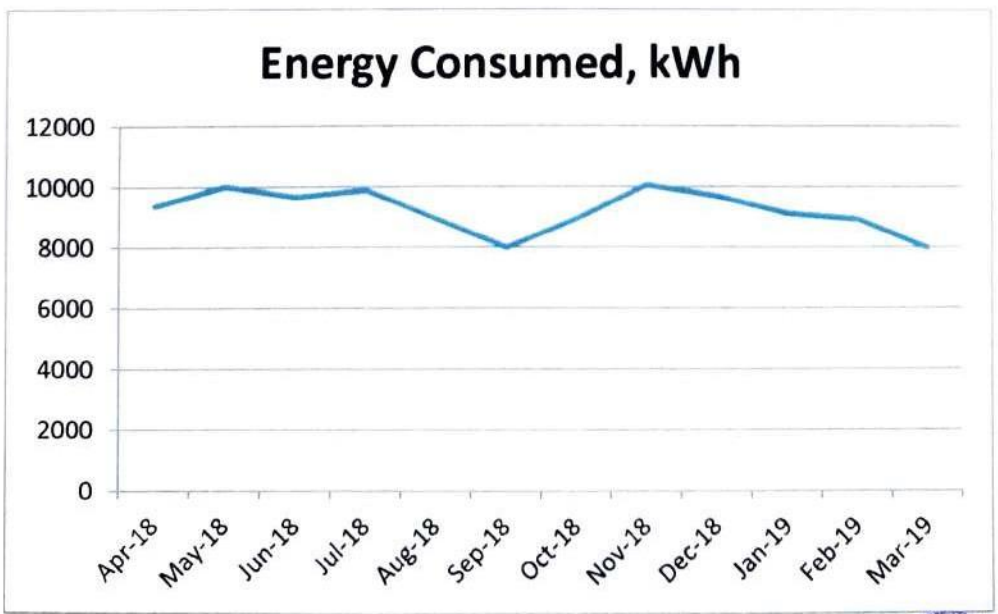

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Chart No 3: To study the variation of Month wise LPG Consumption, Kg:

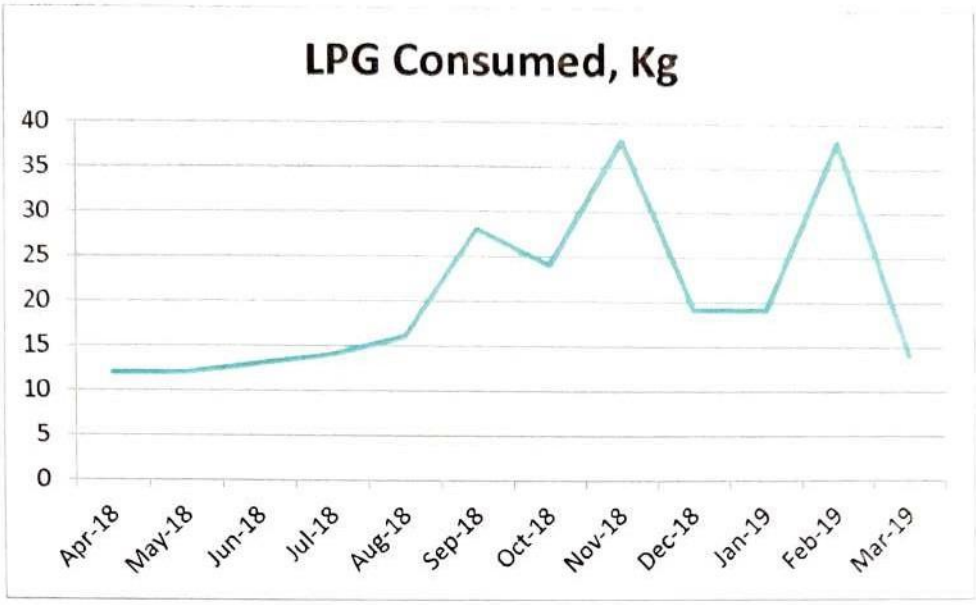

Table No 4: Key Parameters:

No	Parameter	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	110577	247
2	Maximum	10052	38
3	Minimum	7996	12
4	Average	9214.75	20.58

BACK TO SUMMARY

Dr N S Vyawahare

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CHAPTER-IV
SUDY OF CARBON FOOT PRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is:

- **1 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 5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Apr-18	9368	12	7.53
2	May-18	10015	12	8.04
3	Jun-18	9652	13	7.76
4	Jul-18	9875	14	7.94
5	Aug-18	8935	16	7.19
6	Sep-18	7996	28	6.47
7	Oct-18	8936	24	7.21
8	Nov-18	10052	38	8.14
9	Dec-18	9685	19	7.80
10	Jan-19	9125	19	7.35
11	Feb-19	8936	38	7.25
12	Mar-19	8002	14	6.44
13	Total	110577	247	89.12
14	Maximum	10052	38	8.14
15	Minimum	7996	12	6.44
16	Average	9214.75	20.58	7.43

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BACK TO SUMMARY

Chart No 4: Representation of Month wise CO_2 emissions:

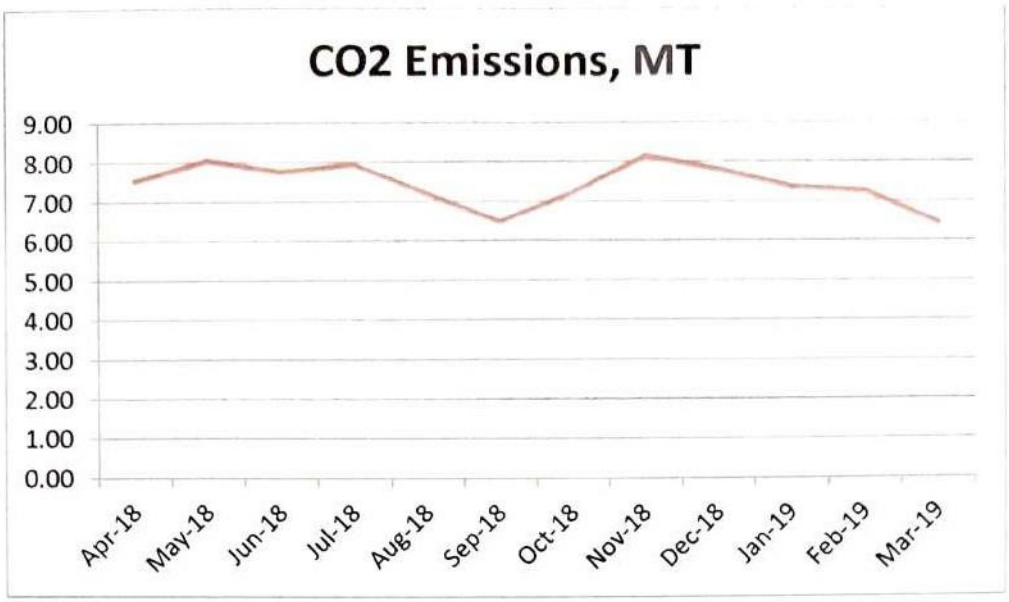

Table No 6: Key Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	110577	247	89.12
2	Maximum	10052	38	8.14
3	Minimum	7996	12	6.44
4	Average	9214.75	20.58	7.43

Dr N S Vyawahare

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BACK TO SUMMARY

CHAPTER-V
SUDY OF USAGE OF RENEWABLE ENERGY

The College is in process of installation of Roof Top Solar PV Plant of Capacity **15.36 kWp.**

BACK TO SUMMARY

Dr N S Vyawahare

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Date: 2023.06.15 13:30:58 +05'30'

CHAPTER VI
STUDY OF USAGE OF LED LIGHTS

In the following Table, we present the percentage of Total Lighting load met by LED lights.

Table No 7: Computation of Usage of LED to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	312	Nos
2	Demand of 40 W FTL Fitting	40	W/Unit
3	Total Electrical Load of 40 W FTL Fittings	**12.48**	kW
4	No of 20 W LED Tube Lights	62	Nos
5	Demand of 20 W LED Tube Light	20	W/Unit
6	Total Electrical Load of 20 W LED Fittings	**1.24**	kW
7	No of 16 W Panel LED Fittings	48	Nos
8	Demand of 16 W Panel LED Fittings	16	W/Unit
9	Total Electrical Load of 16 W Panel LED Fittings	**0.77**	kW
10	No of 11 W LED Fittings	190	Nos
11	Demand of 11 W LED Fittings	11	W/Unit
12	Total Electrical Load of 11 W LED Fittings	**2.09**	kW
13	No of PL Type 36 W CFL Fittings	24	Nos
14	Demand of PL Type 36 W CFL Fittings	36	W/Unit
15	Total Electrical Load of PL Type 36 W CFL Fittings	**0.864**	kW
16	Total LED Lighting Load= 6+9+12	**4.10**	kW
17	Total Lighting Load=3+6+9+12+15	**17.442**	kW
18	**Annual Lighting Requirement met by LED= 16*100/17**	**23**	%

Dr N S Vyawahare

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BACK TO SUMMARY

GREEN AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

Year: 2018-19

Prepared by

ENRICH CONSULTANTS

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

BACK TO SUMMARY

ENRICH CONSULTANTS PUNE

Dr N S Vyawahare

Digitally signed by Dr N S Vyawahare
Date: 2023.06.15 13:33:10 +05'30'

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: 020-26614393/26614403
Email: ece@mahaurja.com, Web: www.mahaurja.com

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

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

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

Name and Address of the firm	:	**Enrich Consultants** Yashashree, Plot No. 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Energy Conservation Programme*
Registration Number	:	***MEDA/ECN/CR-05/2018-19/EA-03***

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **31st March 2021** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

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

Dr N S Vyawahare
Digitally signed by Dr N S Vyawahare
Date: 2023.06.15 13:34:07 +05'30'

BACK TO SUMMARY

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/DYPCOP/18-19/02 Date: 1/7/2019

CERTIFICATE

This is to certify that we have conducted Green Audit at Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2018-19.

The College has adopted following Energy Efficient & Green practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Segregation of Waste at source
- Installation of Sewage Treatment Plant
- Implementation 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,

A Mehendale

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS PUNE

Dr N S Vyawahare
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Date: 2023.06.15 13:35:04 +05'30'

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Dr N S Vyawahare

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Date: 2023.06.15 13:36:03 +05'30'

BACK TO SUMMARY

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Green Audit of Akurdi campus for the Academic Year: 2018-19.

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

Dr N S Vyawahare

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Date: 2023.06.15 13:37:02 +05'30'

BACK TO SUMMARY

EXECUTIVE SUMMARY

1. **Dr. D Y Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune** consumes Energy in the form of **Electrical Energy & LPG;** used for various gadgets, Office & other facilities.

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

No	Parameter /Value	Energy Consumed, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Total	110577	247	89.12
2	Maximum	10052	38	8.14
3	Minimum	7996	12	6.44
4	Average	9214.75	20.58	7.43

3. **Various Majors Adopted for Energy Conservation:**

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

4. **Usage of Renewable Energy:**

The College is in process of installation of Roof Top Solar PV Plant of Capacity **15.36 kWp.**

5. **Waste Management:**

5.1 Segregation of Waste at Source:

The waste is segregated at the source. There are Waste Collection Bins at various locations, to collect the Waste.

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **100 KLPD**. The treated Water is used for watering the Garden.

6. **Rain Water Management:**

The College has installed Rain Water Management Project; the Rain Water from the terrace is used to recharge the underground water table.

7. **Green Practices:**

- Well maintained internal road
- Well maintained Garden.

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

Dr N S Vyawahare Digitally signed by Dr N S Vyawahare Date: 2023.06.15 13:38:07 +05'30'

BACK TO SUMMARY

ABBREVIATIONS

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

Dr N S Vyawahare

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Date: 2023.06.15 13:39:07 +05'30'

BACK TO SUMMARY

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
2	Address	Dr. D Y Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	2002

Dr N S Vyawahare

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Date: 2023.06.15 13:40:06 +05'30'

BACK TO SUMMARY

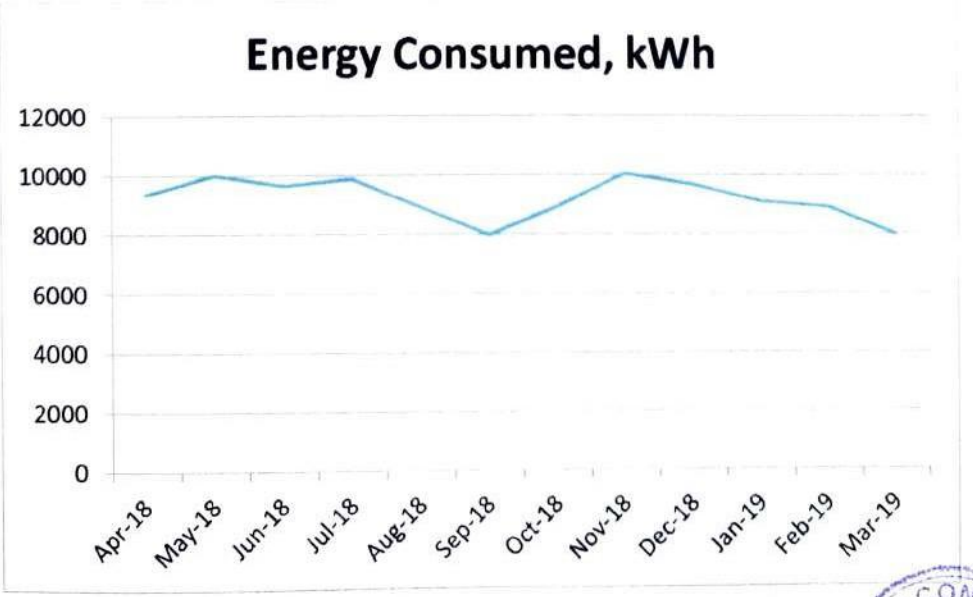
CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Electrical Energy & LPG Consumption Analysis- 2018-19:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg
1	Apr-18	9368	12
2	May-18	10015	12
3	Jun-18	9652	13
4	Jul-18	9875	14
5	Aug-18	8935	16
6	Sep-18	7996	28
7	Oct-18	8936	24
8	Nov-18	10052	38
9	Dec-18	9685	19
10	Jan-19	9125	19
11	Feb-19	8936	38
12	Mar-19	8002	14
13	Total	110577	247
14	Maximum	10052	38
15	Minimum	7996	12
16	Average	9214.75	20.58

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



Dr N S Vyawahare
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BACK TO SUMMARY

Chart No 2: To study the variation of Month wise LPG Consumption, Kg:

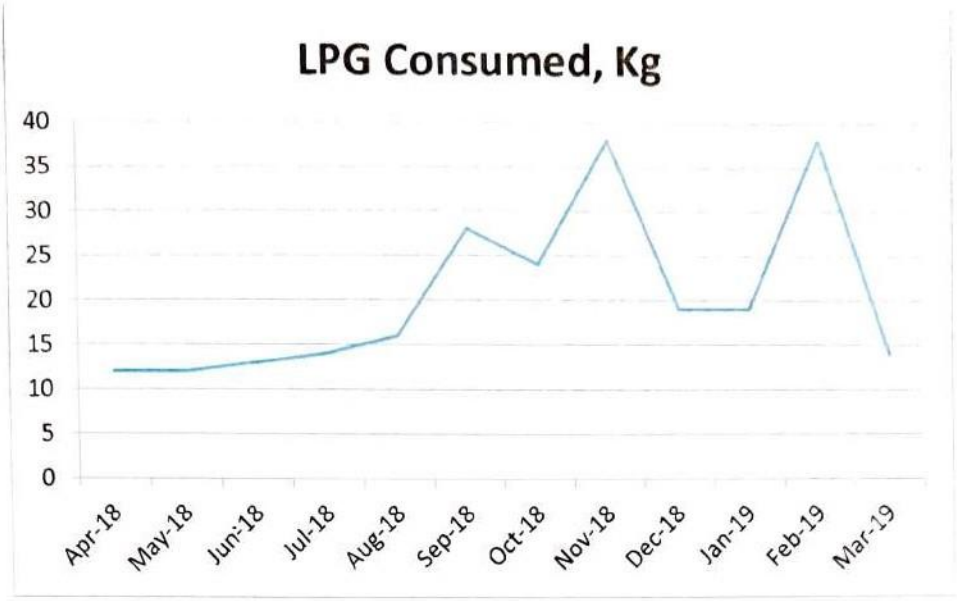

Table No 3: Key Parameters:

No	Parameter	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	110577	247
2	Maximum	10052	38
3	Minimum	7996	12
4	Average	9214.75	20.58

Dr N S Vyawahare

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BACK TO SUMMARY

CHAPTER-III
STUDY OF CARBON FOOT PRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is:

- **1 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 Consumed, Kg	CO2 Emissions, MT
1	Apr-18	9368	12	7.53
2	May-18	10015	12	8.04
3	Jun-18	9652	13	7.76
4	Jul-18	9875	14	7.94
5	Aug-18	8935	16	7.19
6	Sep-18	7996	28	6.47
7	Oct-18	8936	24	7.21
8	Nov-18	10052	38	8.14
9	Dec-18	9685	19	7.80
10	Jan-19	9125	19	7.35
11	Feb-19	8936	38	7.25
12	Mar-19	8002	14	6.44
13	Total	110577	247	89.12
14	Maximum	10052	38	8.14
15	Minimum	7996	12	6.44
16	Average	9214.75	20.58	7.43

BACK TO SUMMARY

Dr N S Vyawahare

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Chart No 3: Representation of Month wise CO_2 emissions:

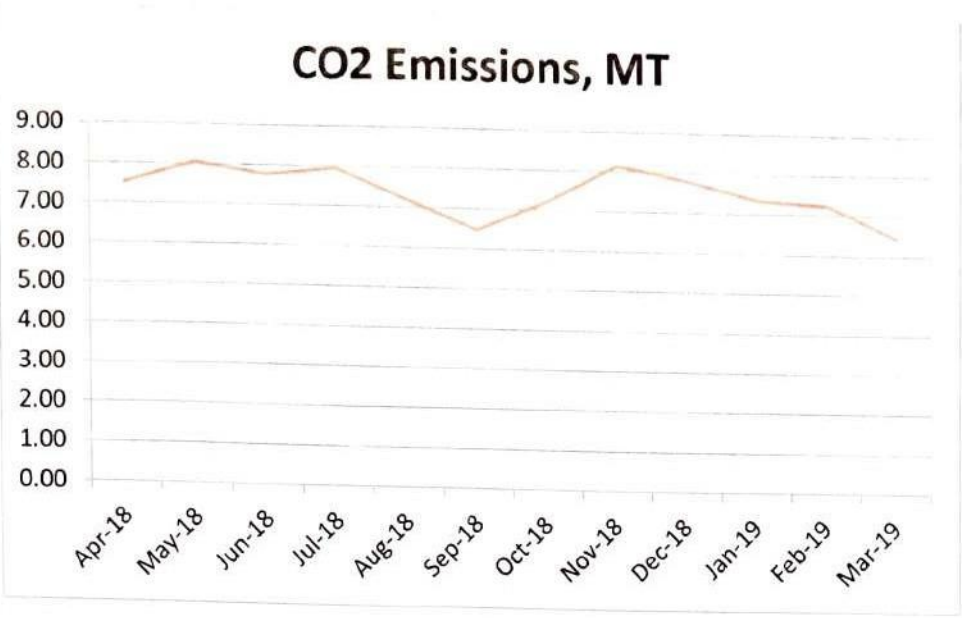

Table No 5: Key Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	110577	247	89.12
2	Maximum	10052	38	8.14
3	Minimum	7996	12	6.44
4	Average	9214.75	20.58	7.43

Dr N S Vyawahare

Digitally signed by Dr N S Vyawahare
Date: 2023.06.15 13:44:51 +05'30'

BACK TO SUMMARY

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

The College is in process of installation of Roof Top Solar PV Plant of Capacity **15.36 kWp.**

Dr N S Vyawahare

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Date: 2023.06.15 13:46:04 +05'30'

BACK TO SUMMARY

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The College has good housekeeping practices. The Waste is segregated at source. Waste collection Bins are placed at strategic locations.

Photograph of Waste Collection Bin:

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **100 KLPD.** The treated Water is used for Watering the internal Garden.

Photograph of Sewage Treatment Plant:

Dr N S Vyawahare

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BACK TO SUMMARY

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project; the Rain Water from the terrace is used to recharge the underground water table.

Photograph of Rain Water Carrying Pipe:

Dr N S Vyawahare

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Date: 2023.06.15 13:49:07 +05'30'

BACK TO SUMMARY

CHAPTER-VII
STUDY OF GREEN PRACTICES

7.1 Pedestrian Friendly Internal Road:

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

Photograph of Internal Road & Tree Plantation:

7.2 Tree Plantation:

The College has well maintained lawn and Tree Plantation in the campus.

Photograph of Internal Tree Plantation:

Dr N S Vyawahare

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Date: 2023.06.15 13:50:19 +05'30'

BACK TO SUMMARY

Dr. D. Y. Patil Pratishthan's
Dr. D. Y. PATIL COLLEGE OF PHARMACY
Dr. D. Y. Patil Educational Complex, Sector - 29, Pradhikaran, Akurdi, Pune 411 044.
Tel. : 020-27656141, Tel. Fax : 020-27656141
E-mail : info@dyppharmaakurdi.ac.in Web : www.dyppharmaakurdi.ac.in
Approved by : All India Council for Techinical Education, New Delhi
Pharmacy Council of India, New Delhi. Recognized by : Government of Maharashtra
Affiliated to Savitribai Phule Pune University, Pune

Dr. Sanjay D. Patil
President

Padmashree Dr. D. Y. Patil
Founder

Shri. Satej D. Patil
Vce-President & Chairman

Dr. N. S. Vyawahare
Principal

Ref. No. : DYPCOP/
Date :

2017-18

Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
Akurdi, Pune - 44.

Dr N S Vyawahare
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Date: 2023.06.15 13:51:30 +05'30'

BACK TO SUMMARY

ENERGY AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

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

Dr N S Vyawahare

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Date: 2023.06.15 14:52:59 +05'30'

ENRICH CONSULTANTS PUNE

BACK TO SUMMARY

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006
Ph No. 020-26614393/266144403, Fax No. 020-26615031
Email econ@mahaurja.com , Web www.mahaurja.com

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

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

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

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

- The Save Energy Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid upto **3 year** from the date of registration, to carry out energy audits under the Save Energy Programme of MEDA.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

(Smita Kudarikar)
Manager (EC)

Dr N S Vyawahare
Digitally signed by Dr N S Vyawahare
Date: 2023.06.15 14:56:04 +05'30'

BACK TO SUMMARY

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

Ref: EC/DYPCOP/17-18/01

Date: 21/6/2018

CERTIFICATE

This is to certify that we have conducted Energy Audit at Dr. D. Y. Patil Pratishthan's, Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2017-18.

The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting

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

For Enrich Consultants,

A Mehendale

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS PUNE

Dr N S Vyawahare

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Date: 2023.06.15 14:57:33 +05'30'

BACK TO SUMMARY

INDEX

Dr N S Vyawahare

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Date: 2023.06.15 14:59:01 +05'30'

BACK TO SUMMARY

ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's Dr. D.Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Energy Audit of Akurdi campus for the Academic Year: 2017-18.

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

Dr N S Vyawahare

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Date: 2023.06.15 15:00:38 +05'30'

BACK TO SUMMARY

EXECUTIVE SUMMARY

1. **Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune** consumes Energy in the form of **Electrical Energy & LPG**; used for various gadgets, Office & other facilities.

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

No	Parameter /Value	Energy Consumed, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Total	116908	228	94.14
2	Maximum	11036	38	8.86
3	Minimum	8936	10	7.23
4	Average	9742.33	19.00	7.84

3. **Various Measures Adopted for Energy Conservation:**

- Usage of Energy efficient LED fittings
- Usage of BEE STAR Rated Equipment

4. **Usage of Renewable Energy:**

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

5. **Usage of LED Lighting:**

- The Total LED Lighting Load is **3.69 kW.**
- The Total Lighting Load is **17.479 kW.**
- The % of LEDs to Total Lighting Load is **21%.**

6. **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

Dr N S Vyawahare

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BACK TO SUMMARY

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ABBREVIATIONS

AC	:	Air conditioner
LED	:	Light Emitting Diode
PL	:	Pin Type Light Fitting
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
D/L	:	Down Lighter
PC	:	Personal Computer
MT	:	Metric Ton

Dr N S Vyawahare

Digitally signed by Dr N S Vyawahare
Date: 2023.06.15 15:04:24 +05'30'

BACK TO SUMMARY

CHAPTER-I
INTRODUCTION

1.1 Objectives:

1. To study Connected Load
2. To study present level of Energy Consumption
3. To Study the present CO_2 emissions
4. To study Usage of Renewable Energy
5. To study usage of LED Lights

1.2 Table No1: General Details of College:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
2	Address	Dr. D. Y. Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	2002

Dr N S Vyawahare

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Date: 2023.06.15 15:05:45 +05'30'

BACK TO SUMMARY

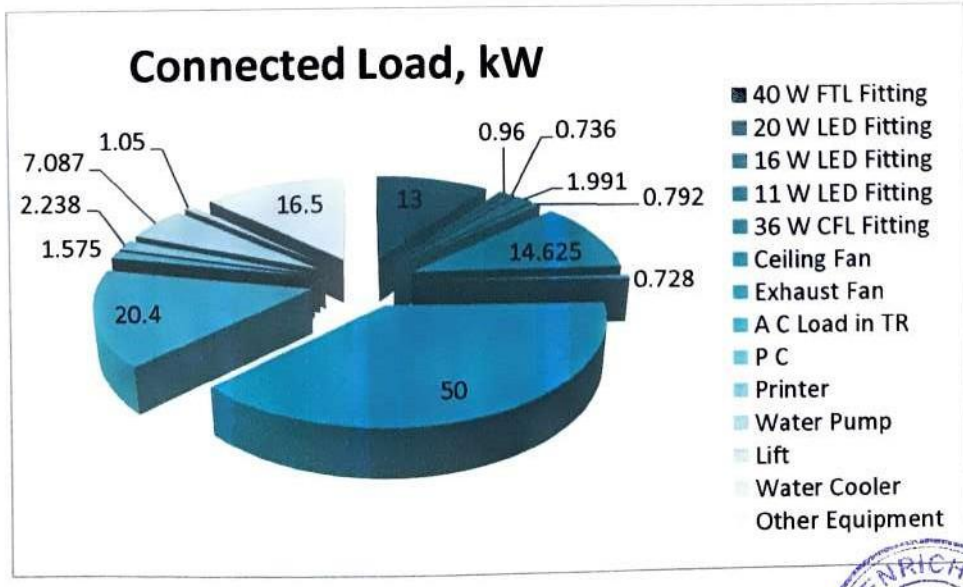
CHAPTER-II
STUDY OF CONNECTED LOAD

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

Table No-2: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/Unit	Load, kW
1	40 W FTL Fitting	325	40	13
2	20 W LED Fitting	48	20	0.96
3	16 W LED Fitting	46	16	0.736
4	11 W LED Fitting	181	11	1.991
5	36 W CFL Fitting	22	36	0.792
6	Ceiling Fan	225	65	14.625
7	Exhaust Fan	14	52	0.728
8	A C Load in TR	40	1250	50
9	P C	136	150	20.4
10	Printer	9	175	1.575
11	Water Pump	1	2238	2.238
12	Lift	1	7087	7.087
13	Water Cooler	3	350	1.05
14	Other Equipment	110	150	16.5
15	**Total**			**132**

Chart No-1: Details of Connected Load:



Dr N S Vyawahare Digitally signed by Dr N S Vyawahare Date: 2023.06.15 15:07:28 +05'30'

BACK TO SUMMARY

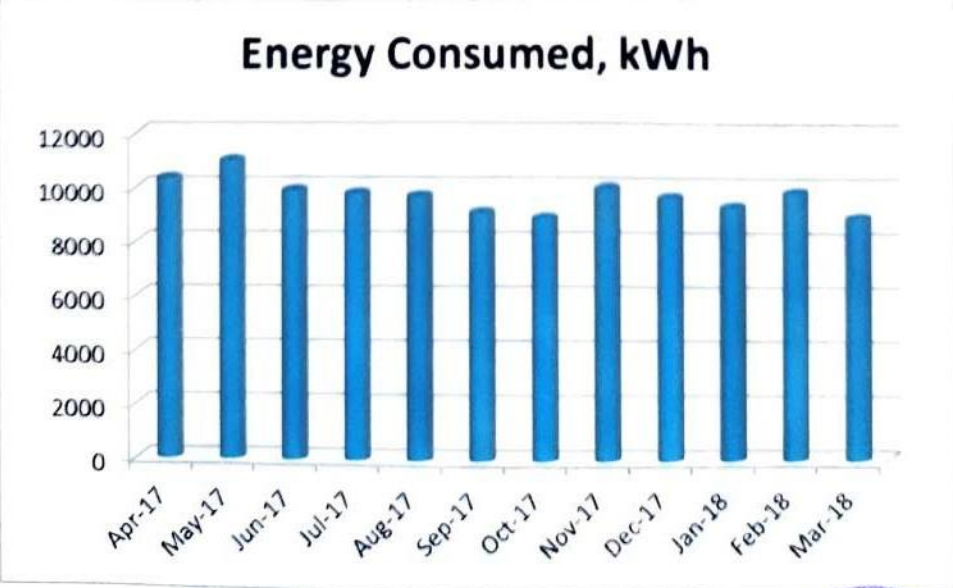
CHAPTER-III
STUDY OF ELECTRICAL ENERGY CONSUMPTION

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

Table No 3: Electrical Energy & LPG Consumption Analysis- 2017-18:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg
1	Apr-17	10365	15
2	May-17	11036	12
3	Jun-17	9936	12
4	Jul-17	9825	10
5	Aug-17	9725	17
6	Sep-17	9126	38
7	Oct-17	8936	38
8	Nov-17	10034	19
9	Dec-17	9685	19
10	Jan-18	9365	10
11	Feb-18	9902	19
12	Mar-18	8973	19
13	Total	116908	228
14	Maximum	11036	38
15	Minimum	8936	10
16	Average	9742.33	19.00

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



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BACK TO SUMMARY

Chart No 3: To study the variation of Month wise LPG Consumption, Kg:

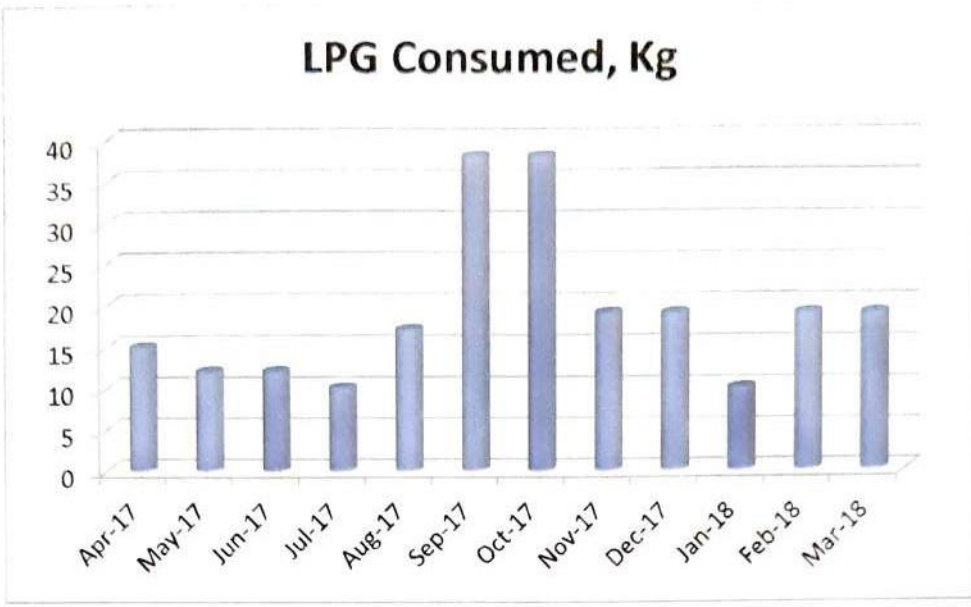

Table No 4: Key Parameters:

No	Parameter	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	116908	228
2	Maximum	11036	38
3	Minimum	8936	10
4	Average	9742.33	19.00

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BACK TO SUMMARY

CHAPTER-IV
STUDY OF CARBON FOOT PRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is:

- **1 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 5: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Apr-17	10365	15	8.33
2	May-17	11036	12	8.86
3	Jun-17	9936	12	7.98
4	Jul-17	9825	10	7.89
5	Aug-17	9725	17	7.83
6	Sep-17	9126	38	7.40
7	Oct-17	8936	38	7.25
8	Nov-17	10034	19	8.08
9	Dec-17	9685	19	7.80
10	Jan-18	9365	10	7.52
11	Feb-18	9902	19	7.97
12	Mar-18	8973	19	7.23
13	Total	116908	228	94.14
14	Maximum	11036	38	8.86
15	Minimum	8936	10	7.23
16	Average	9742.33	19.00	7.84

BACK TO SUMMARY

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Chart No 4: Representation of Month wise CO_2 emissions:

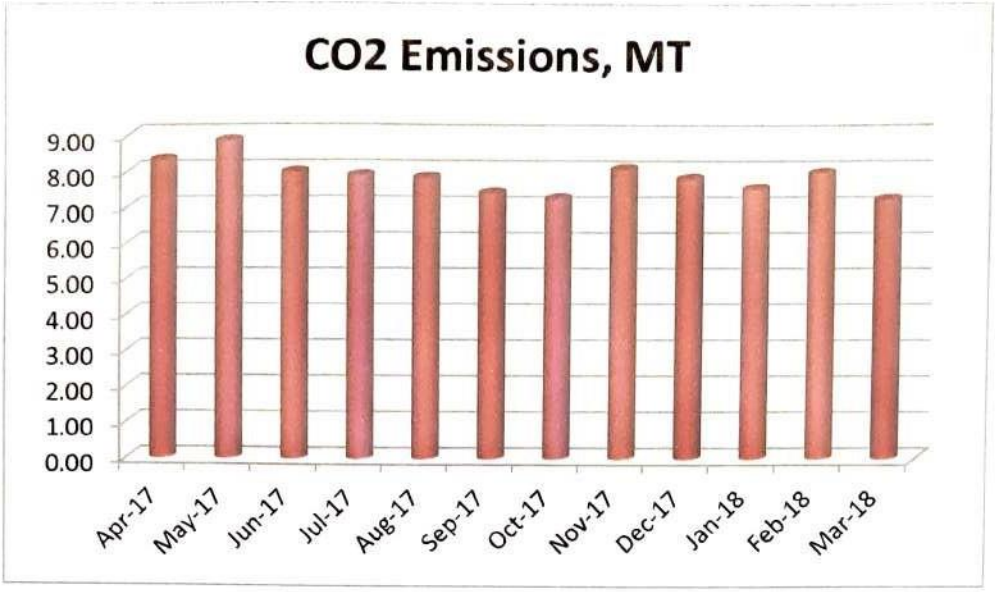

Table No 6: Key Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	116908	228	94.14
2	Maximum	11036	38	8.86
3	Minimum	8936	10	7.23
4	Average	9742.33	19.00	7.84

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BACK TO SUMMARY

CHAPTER V
SUDY OF USAGE OF RENEWABLE ENERGY

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

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BACK TO SUMMARY

CHAPTER VI
STUDY OF USAGE OF LED LIGHTS

In the following Table, we present the percentage of Total Lighting load met by LED lights.

Table No 7: Computation of Usage of LED to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	325	Nos
2	Demand of 40 W FTL Fitting	40	W/Unit
3	Total Electrical Load of 40 W FTL Fittings	**13**	kW
4	No of 20 W LED Tube Lights	48	Nos
5	Demand of 20 W LED Tube Light	20	W/Unit
6	Total Electrical Load of 20 W LED Fittings	**0.96**	kW
7	No of 16 W Panel LED Fittings	46	Nos
8	Demand of 16 W Panel LED Fittings	16	W/Unit
9	Total Electrical Load of 16 W Panel LED Fittings	**0.74**	kW
10	No of 11 W LED Fittings	181	Nos
11	Demand of 11 W LED Fittings	11	W/Unit
12	Total Electrical Load of 11 W LED Fittings	**1.991**	kW
13	No of PL Type 36 W CFL Fittings	22	Nos
14	Demand of PL Type 36 W CFL Fittings	36	W/Unit
15	Total Electrical Load of PL Type 36 W CFL Fittings	**0.792**	kW
16	Total LED Lighting Load= 6+9+12	**3.69**	kW
17	Total Lighting Load=3+6+9+12+15	**17.479**	kW
18	**Annual Lighting Requirement met by LED= 16*100/17**	**21**	%

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BACK TO SUMMARY

GREEN AUDIT REPORT

of

Dr. D. Y. Patil Pratishthan's,

DR. D. Y. PATIL COLLEGE OF PHARMACY

Pradhikaran, Akurdi, Pune

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

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Dr N S Vyawahare

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BACK TO SUMMARY

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006
Ph No. 020-26614393/266144403. Fax No. 020-26615031
Email: econ@mahaurja.com , Web: www.mahaurja.com

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

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

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

Name and Address of the firm : Enrich Consultants
Yashashree, Plot No. 26,Nirmal Baug Society,Parvati, Pune - 411009.

Registration Category : Empanelled *Consultant for Save Energy Programme.*

Registration Number : ***MEDA/ECN/CR-01/2017-18/EA-37***

- The Save Energy Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid upto **3 year** from the date of registration, to carry out energy audits under the Save Energy Programme of MEDA.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

(Smita Kudarikar)
Manager (EC)

Dr N S Vyawahare

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BACK TO SUMMARY

Enrich Consultants

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

Ref: EC/DYPCOP/17-18/02

Date: 21/6/2018

CERTIFICATE

This is to certify that we have conducted Green Audit at Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune in the Academic year 2017-18.

The College has adopted following Energy Efficient & Green practices:

- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Segregation of Waste at source
- Installation of Sewage Treatment Plant
- Implementation 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,

ENRICH CONSULTANTS PUNE

A Y Mehendale,
Certified Energy Auditor
EA-8192

Dr N S Vyawahare

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Dr N S Vyawahare

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Dr. D. Y. Patil Pratishthan's, Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune, for awarding us the assignment of Green Audit of Akurdi campus for the Academic Year: 2017-18.

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

Dr N S Vyawahare

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BACK TO SUMMARY

EXECUTIVE SUMMARY

1. Dr. D Y Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy, Akurdi, Pune consumes Energy in the form of **Electrical Energy & LPG**; used for various gadgets.

2. Present Energy Consumption& CO_2 Emission:

No	Parameter /Value	Energy Consumed, kWh	LPG Consumed, Kg	CO_2 Emissions, MT
1	Total	116908	228	94.14
2	Maximum	11036	38	8.86
3	Minimum	8936	10	7.23
4	Average	9742.33	19.00	7.84

3. Various Measures Adopted for Energy Conservation:

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

4. Usage of Renewable Energy:

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

5. Waste Management:

5.1 Segregation of Waste at Source:

The waste is segregated at the source. There are Waste Collection Bins at various locations, to collect the Waste.

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **100 KLPD**. The treated Water is used for watering the Garden.

6. Rain Water Management:

The College has installed Rain Water Management Project; the Rain Water from the terrace is used to recharge the underground water table.

7. Green Practices:

- Good internal road
- Internal Tree Plantation.

8. Assumptions:

- **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

Dr N S Vyawahare

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BACK TO SUMMARY

ABBREVIATIONS

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

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BACK TO SUMMARY

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name	Dr. D. Y. Patil Pratishthan's Dr. D. Y. Patil College of Pharmacy
2	Address	Dr. D. Y. Patil Educational Complex, Sector 29, Nigdi, Pradhikaran, Akurdi, Pune
3	Year of Establishment	2002

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BACK TO SUMMARY

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

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

Table No 2: Electrical Energy & LPG Consumption Analysis- 2018-19:

No	Month	Energy Purchased, kWh	LPG Consumed, Kg
1	Apr-17	10365	15
2	May-17	11036	12
3	Jun-17	9936	12
4	Jul-17	9825	10
5	Aug-17	9725	17
6	Sep-17	9126	38
7	Oct-17	8936	38
8	Nov-17	10034	19
9	Dec-17	9685	19
10	Jan-18	9365	10
11	Feb-18	9902	19
12	Mar-18	8973	19
13	Total	116908	228
14	Maximum	11036	38
15	Minimum	8936	10
16	Average	9742.33	19.00

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

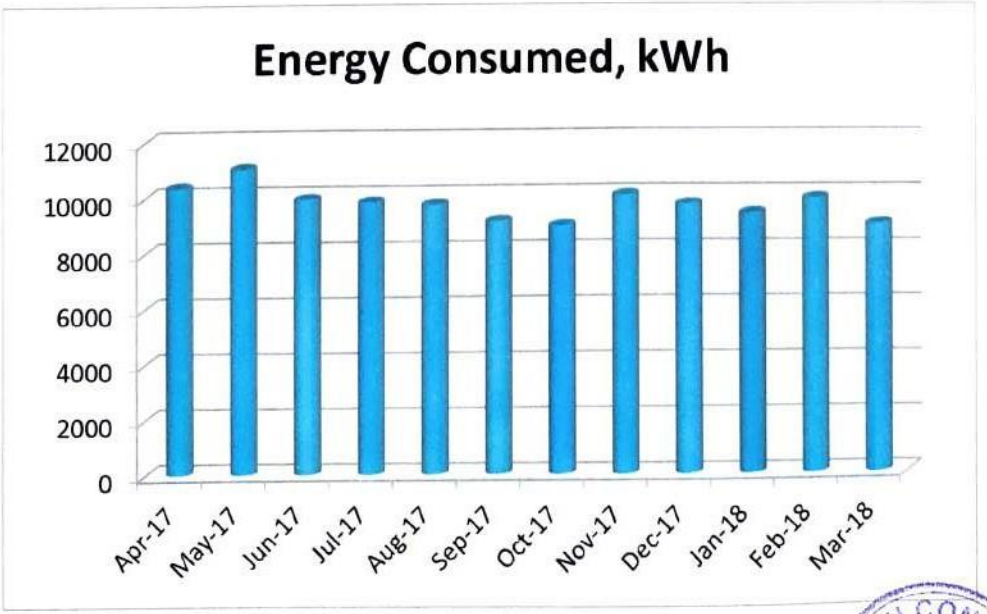

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Chart No 2: To study the variation of Month wise LPG Consumption, Kg:

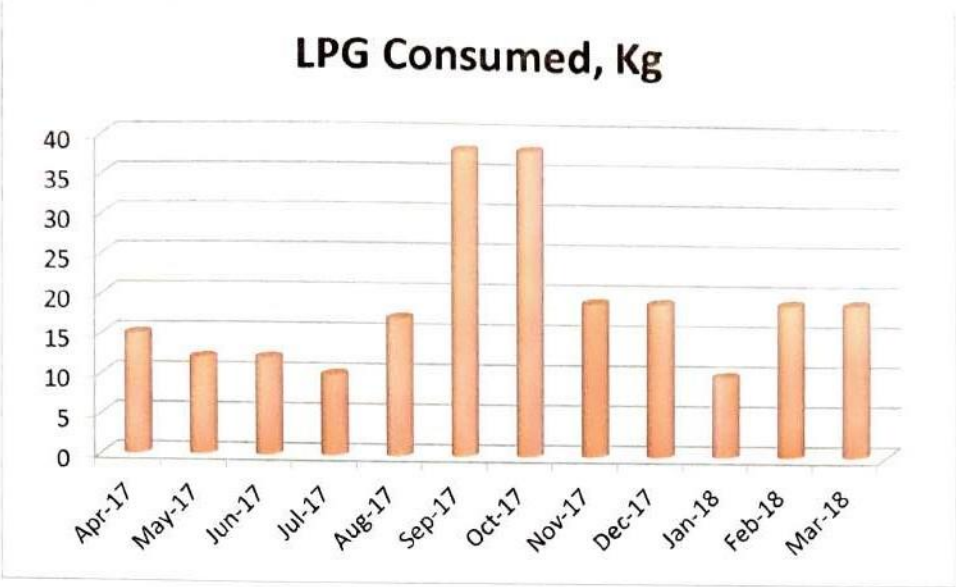

Table No 3: Key Parameters:

No	Parameter	Energy Purchased, kWh	LPG Consumed, Kg
1	Total	116908	228
2	Maximum	11036	38
3	Minimum	8936	10
4	Average	9742.33	19.00

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BACK TO SUMMARY

CHAPTER-III
STUDY OF CARBON FOOTPRINTING

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions due to Electrical Energy is:

- **1 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 Consumed, Kg	CO2 Emissions, MT
1	Apr-17	10365	15	8.33
2	May-17	11036	12	8.86
3	Jun-17	9936	12	7.98
4	Jul-17	9825	10	7.89
5	Aug-17	9725	17	7.83
6	Sep-17	9126	38	7.40
7	Oct-17	8936	38	7.25
8	Nov-17	10034	19	8.08
9	Dec-17	9685	19	7.80
10	Jan-18	9365	10	7.52
11	Feb-18	9902	19	7.97
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14	Maximum	11036	38	8.86
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Chart No 3: Representation of Month wise CO_2 emissions:

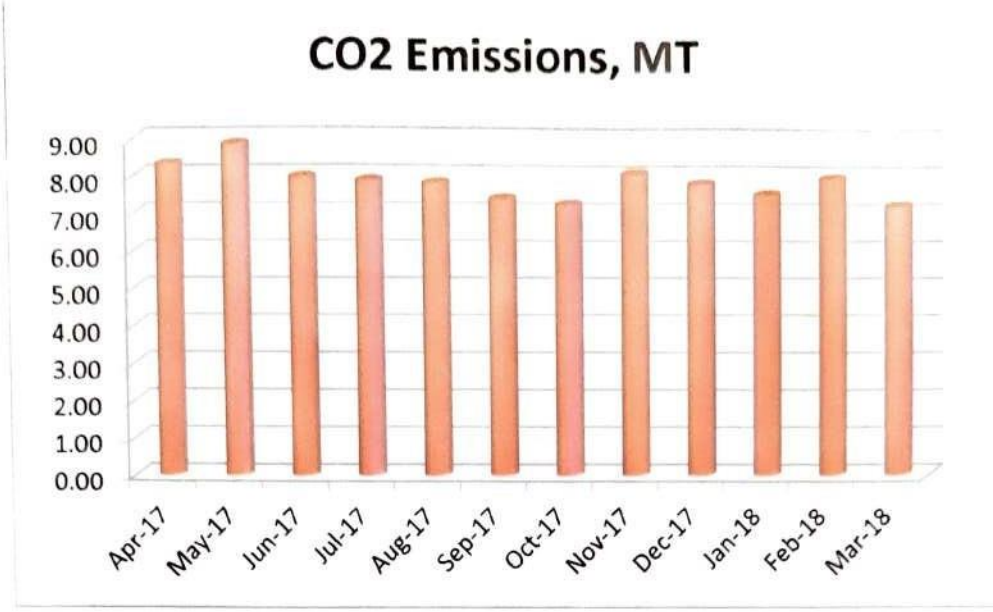

Table No 5: Key Parameters:

No	Parameter/ Value	Energy Purchased, kWh	LPG Consumed, Kg	CO2 Emissions, MT
1	Total	116908	228	94.14
2	Maximum	11036	38	8.86
3	Minimum	8936	10	7.23
4	Average	9742.33	19.00	7.84

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BACK TO SUMMARY

CHAPTER-IV
STUDY OF USAGE OF RENEWABLE ENERGY

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

Dr N S Vyawahare

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BACK TO SUMMARY

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

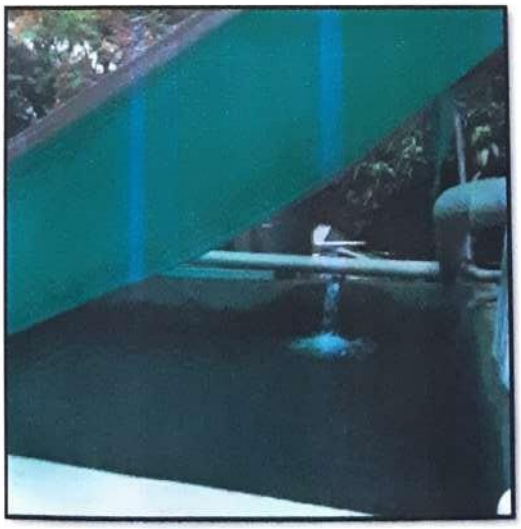
The College has good housekeeping practices. The Waste is segregated at source. Waste collection Bins are placed at strategic locations.

Photograph of Waste Collection Bin:

5.2 Liquid Waste Management:

The College has installed Sewage Treatment Plant of Capacity **100 KLPD.** The treated Water is used for Watering the internal Garden.

Photograph of Sewage Treatment Plant:



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BACK TO SUMMARY

CHAPTER-VI
STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project; the Rain Water from the terrace is used to recharge the underground water table.

Photograph of Rain Water Carrying Pipe:

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BACK TO SUMMARY

CHAPTER-VII
STUDY OF GREEN PRACTICES

7.1 Pedestrian Friendly Internal Road:

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

Photograph of Internal Road & Tree Plantation:

7.2 Tree Plantation:

The College has well maintained lawn and Tree Plantation in the campus.

Photograph of Internal Tree Plantation:

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