ENERGY AUDIT REPORT

of

Shree Santkrupa Shikshan Sanstha's

SHREE SANTKRUPA COLLEGE OF PHARMACY,

Ghogaon (Shivajinagar)

Dist. Satara (M.H.) – 415 111

Year: 2021-22

Prepared by:

M/s.Chandrakant Electricals,Co.

Shetphale, Tal: Atpadi
Sangali 415 306
Phone: 09423272440 Email: chandrakant.electricals23666@gmail.com

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency

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

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

CERTIFICATE OF REGISTRATION
FOR CLASS 'B'

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

Name and Address of the firm	:	M/s. Chandrakant Electrical, Co. A/P: Shetphale, Tal: Atpadi, Dist.: Sangli – 415 306.
Registration Category	:	*Empanelled Consultant for Energy Conservation Programme for Class 'B'*
Registration Number	:	***MEDA/ECN/2022-23/Class B/EA-09.***

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

General Manager (EC)

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

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

CERTIFICATE

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

The College has adopted following Energy Efficient practices:

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

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

For, M/s.Chandrakant Electricals, Co.

M/s. Chandrakant Electricals Co. Sangli
M.C.No. 23666
Shetphale

(Chandrakant Nanvare)

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ACKNOWLEDGEMENT

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

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

EXECUTIVE SUMMARY

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

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

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

3. Energy Conservation projects already installed:

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

4. Usage of Alternate Energy:

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

5. Usage of LED Lighting:

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

6. Assumptions:

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

7. References:

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

ABBREVIATIONS

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

CHAPTER-I
INTRODUCTION

1.1 Objectives:

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

1.2Table No 1: General Details of the College:

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

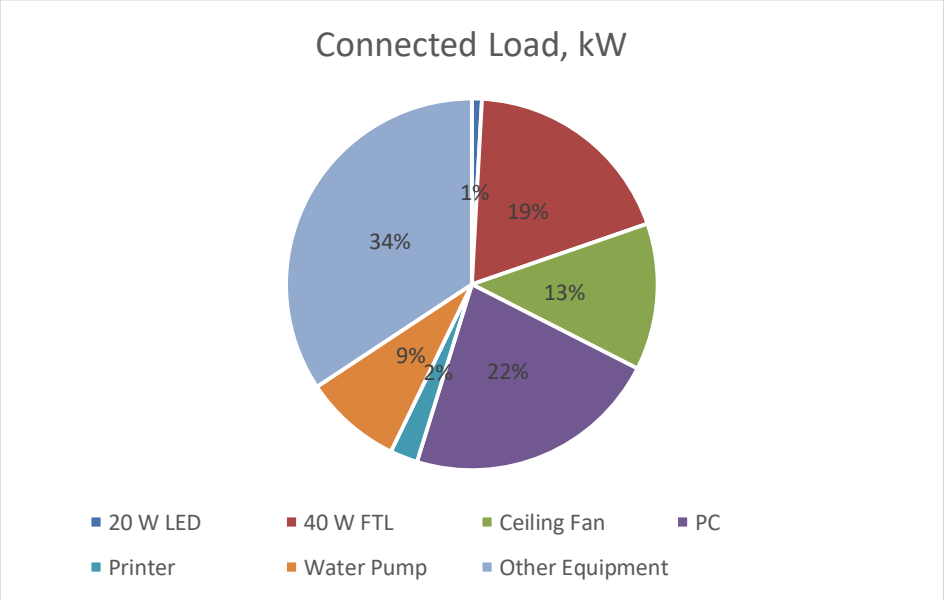
CHAPTER-II
STUDY OF CONNECTED LOAD

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

Table No 2: Study of Equipment wise Connected Load:

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

Chart No 1: Study of Connected Load:



CHAPTER-III
STUDY OF PRESENT ENERGY CONSUMPTION

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

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

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

Chart No 2: Variation in Monthly Energy Consumption:

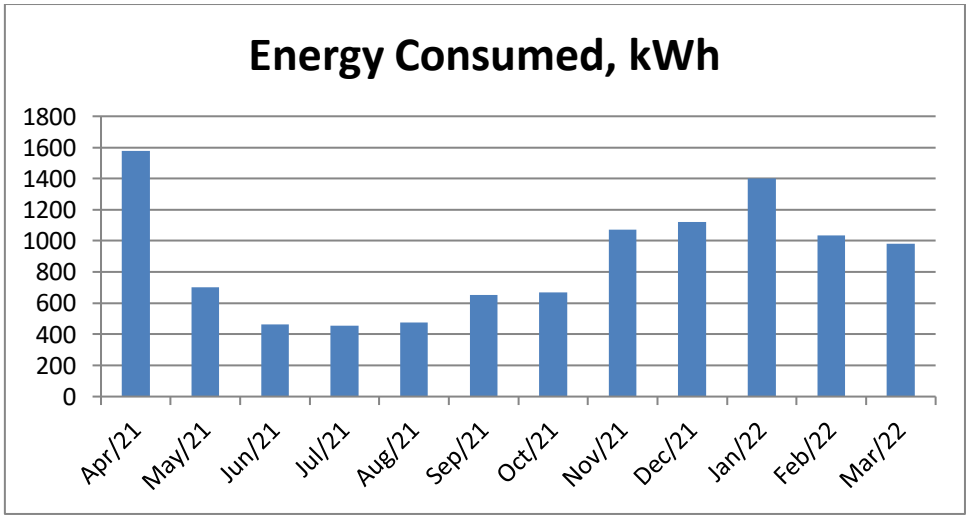


Chart No 3: Variation in Monthly LPG Consumption:

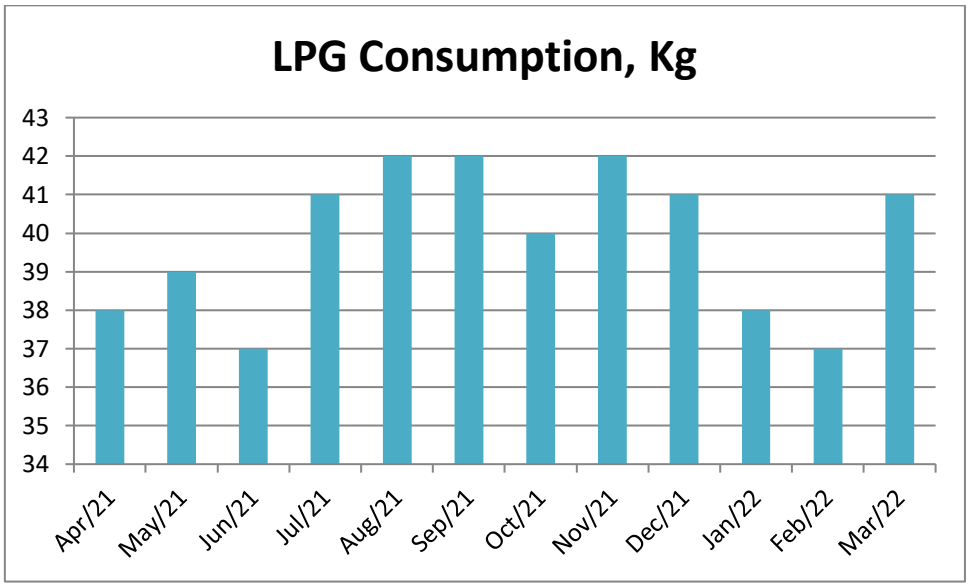


Table No 4: Variation in Important Parameters:

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

CHAPTER-IV
CARBON FOOTPRINTING

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

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

Basis for computation of CO_2 Emissions:

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

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

Table No5: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO2 Emissions, MT
1	Apr-21	1577	1.52
2	May-21	700	0.73
3	Jun-21	463	0.52
4	Jul-21	456	0.52
5	Aug-21	477	0.54
6	Sep-21	652	0.70
7	Oct-21	671	0.71
8	Nov-21	1072	1.08
9	Dec-21	1121	1.12
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11	Feb-22	1036	1.03
12	Mar-22	981	0.99
13	Total	10608	10.83
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Chart No 3: Month wise CO_2 Emissions:

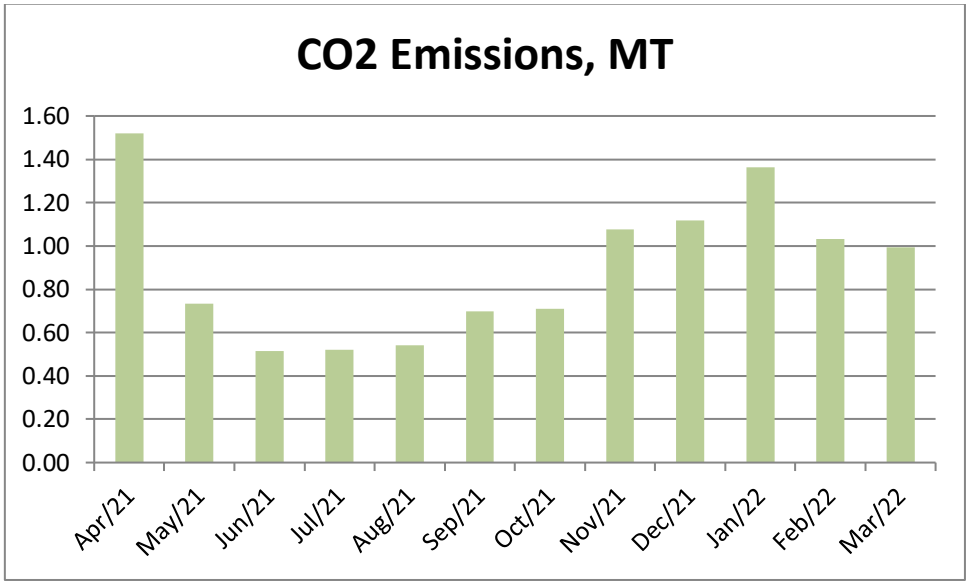

Table No 6: Important Parameters:

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

CHAPTER V
STUDY OF USAGE OF ALTERNATE ENERGY

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

CHAPTER VI
STUDY OF USAGE OF LED LIGHTING

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

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

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