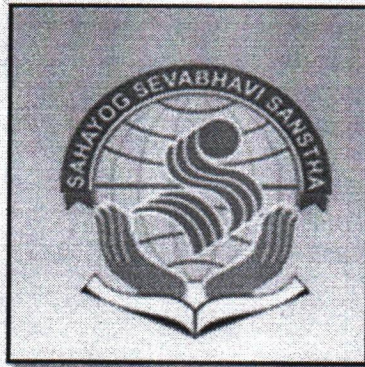


ENERGY AUDIT REPORT
of
SAHAYOG SEVABHAVI SANSTHA COLLEGE OF EDUCATION,
Sahayog Educational Campus, Vishnupuri, Nanded

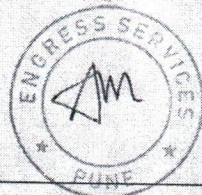



Year: 2021-22

Prepared by:

ENGRESS SERVICES

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




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College of Education
Vishnupuri, Nanded.

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-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 Mukhtangan 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.*

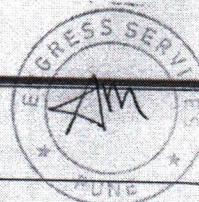
- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly 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)



Engress Services, Pune


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Vishnupuri, Nanded.



ENGRESS SERVICES

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

Ref: ES/SSSCOE/21-22/01

Date: 12/3/2022

CERTIFICATE

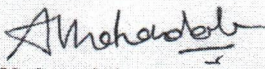
This is to certify that we have conducted Energy Audit at Sahayog Sevabhavi Sanstha College of Education, Sahayog Educational Campus, Vishnupuri, Nanded in the Year 21-22.

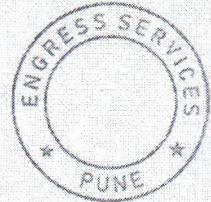
The College has adopted Energy Efficient Practices:

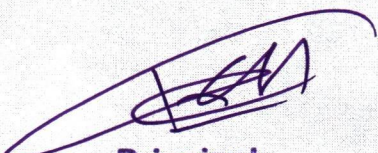
- Usage of Energy Efficient LED Fittings
- Usage of Energy Efficient BEE STAR Rated equipment
- Maximum usage of Day Lighting
- Installation of 10 kWp Capacity Roof Top Solar PV Plant

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,

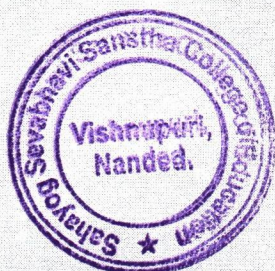

A Y Mehendale,
Certified Energy Auditor
EA-8192




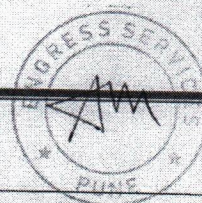

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INDEX

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3	Study of Present Energy Consumption	10
4	Study of CO ₂ Emission	12
5	Study of Usage of Alternate Energy	14
6	Study of Usage Of LED Lighting	15




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ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of Sahayog Sevabhavi Sanstha College of Education, Sahayog Educational Campus, Vishnupuri, Nanded for awarding us the assignment of Energy Audit of their Nanded campus for the Year: 2021-22.

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



Engress Services, Pune

A handwritten signature in purple ink, appearing to be "S. S. S.", written over a horizontal line.

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EXECUTIVE SUMMARY

1. Sahayog Sevabhavi Sanstha College of Education, Sahayog Educational Campus, Vishnupuri, Nanded, consumes Energy in the form of Electrical Energy; used for various gadgets, office & other facilities

2. Present Energy Consumption & CO₂ Emission:

No	Parameter/ Value	Energy Purchased, kWh	CO ₂ Emissions, MT
1	Total	3473	3.13
2	Maximum	410	0.37
3	Minimum	118	0.11
4	Average	289.45	0.26

3. Energy Conservation projects already installed:

- Usage of Energy Efficient LED fittings
- Usage of BEE STAR Rated Equipment
- Installation of 10 kWp Solar PV Plant

4. Usage of Alternate Energy:

- The College has installed a Roof Top Solar PV Plant of Capacity 10 kWp.
- The Energy purchased from MSEDCL is 3473 kWh.
- The Energy Generated by Roof Top Solar PV Plant in 21-22 is 12000 kWh.
- The Total Energy Requirement is 15473 kWh.
- The percentage of usage of Alternate Energy to Annual Energy Demand is 78 %.

5. Usage of LED Lighting:

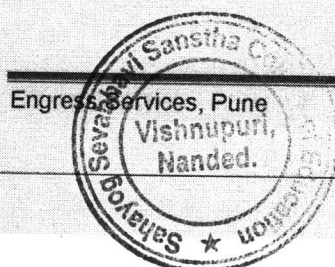
- The Total Lighting load of College is 1.2 kW.
- The LED Lighting Load is 0.64 kW.
- The % of LED Lighting to Total Lighting Load is 53 %.

6. Assumptions:

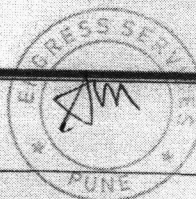
1. 1 kWh of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere
2. Average Energy generated by 1 kWp Solar PV Plant : 4 kWh/Day
3. Annual Solar Energy Generation Days: 300 Nos

7. References:

- For CO₂ Emissions: www.tatapower.com
- For Roof Top Solar Energy generation: www.solarrooftop.gov.in

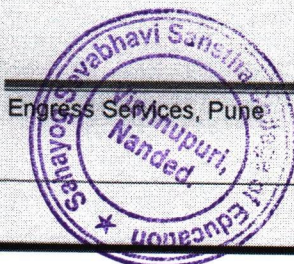


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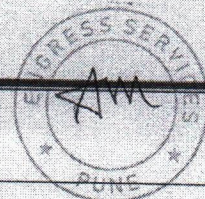


ABBREVIATIONS

BEE	Bureau of Energy Efficiency
SSS	Sahayog Sevabhavi Sanstha
MSEDCL	Maharashtra Electricity Distribution Company Limited
kWh	Kilo Watt Hour
kWp	Kilo Watt Peak
Kg	Kilo Gram
MT	Metric Ton
CO ₂	Carbon Di Oxide
LED	Light Emitting Diode



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CHAPTER-I INTRODUCTION

1.1 Objectives:


1. To study Connected Load
2. To study Present Energy Consumption
3. To compute the CO₂ emissions
4. To study usage of Alternate Energy
5. To study usage of LED Lighting

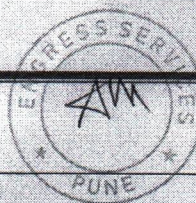
1.2 Table No 1: General Details of the College:

No	Head	Particulars
1	Name of the Institution	Sahayog Sevabhavi Sanstha's College of Education Sahayog Educational Campus, Vishnupuri, Nanded
2	Address	Vishnupuri, Nanded 431 606
3	Year of Establishment	2004
4	Affiliation	Swami Ramanand Teerth Marathwada University, Nanded



Energy Services, Pune


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Page 8

CHAPTER-II STUDY OF CONNECTED LOAD

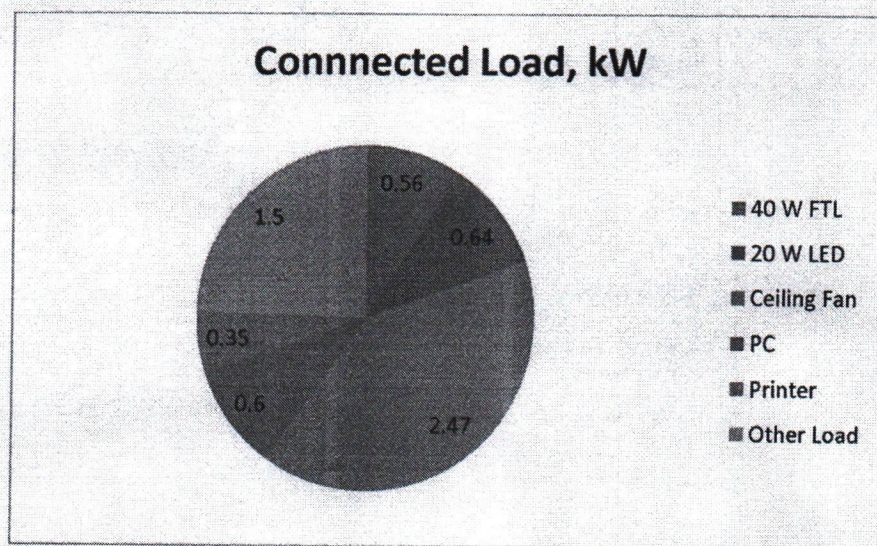
The major contributors to the connected load of the College are as under.

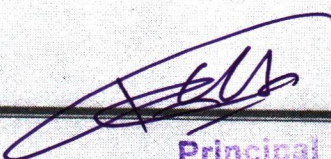
Table No 2: Equipment wise Connected Load:

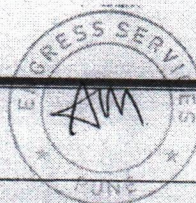
No	Equipment	Qty	Load, W/Unit	Load, kW
1	40 W FTL	14	40	0.56
2	20 W LED	32	20	0.64
3	Ceiling Fan	38	65	2.47
4	PC	4	150	0.6
5	Printer	2	175	0.35
6	Other Load	10	150	1.5
7	Total			6

We present the above Data in a PIE Chart as under.

Chart No1: 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: Study of Electrical Energy Consumption: 21-22:

No	Month	Energy purchased, kWh
1	Dec-21	257
2	Jan-22	118
3	Feb-22	125
4	Mar-22	325
5	Apr-22	285
6	May-22	399
7	Jun-22	410
8	Jul-22	251
9	Aug-22	302
10	Sep-22	298
11	Oct-22	305
12	Nov-22	399
13	Total	3473
14	Maximum	410
15	Minimum	118
16	Average	289.45

Chart No 2: To study the variation of Monthly Electrical Energy Consumption:

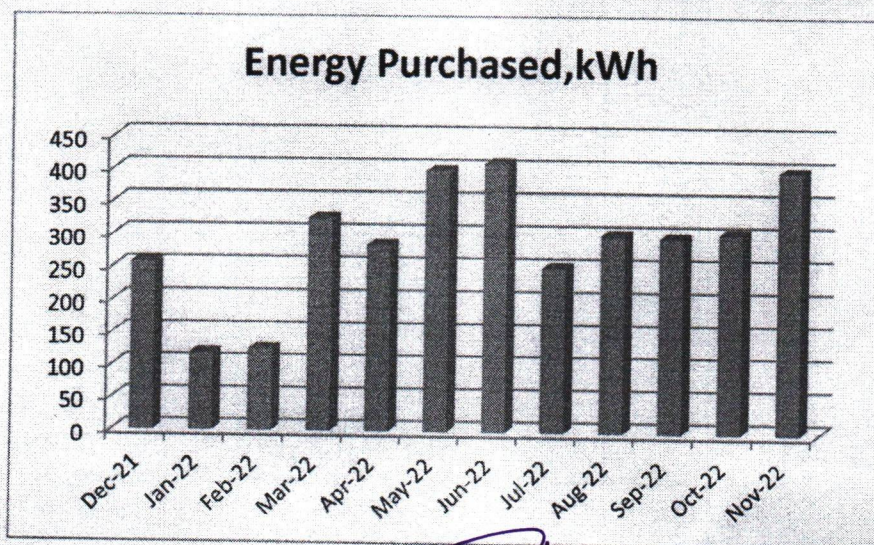


Table No 4: Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh
1	Total	3473
2	Maximum	410
3	Minimum	118
4	Average	289.45



CHAPTER-IV STUDY OF CO₂ EMISSION

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

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

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO₂ Emissions:

The basis of Calculation for CO₂ emissions due to Electrical Energy is as under

- 1 kWh of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere

Based on the above Data we compute the CO₂ emissions which are being released in to the atmosphere by the College due to its Day to Day operations

Table No 5: Month wise CO₂ Emissions:

No	Month	Energy purchased, kWh	CO ₂ Emissions, MT
1	Dec-21	257	0.23
2	Jan-22	118	0.11
3	Feb-22	125	0.11
4	Mar-22	325	0.29
5	Apr-22	285	0.26
6	May-22	399	0.36
7	Jun-22	410	0.37
8	Jul-22	251	0.23
9	Aug-22	302	0.27
10	Sep-22	298	0.27
11	Oct-22	305	0.27
12	Nov-22	399	0.36
13	Total	3473	3.13
14	Maximum	410	0.37
15	Minimum	118	0.11
16	Average	289.45	0.26

Chart No 3: Representation of Month wise CO₂ Emissions:

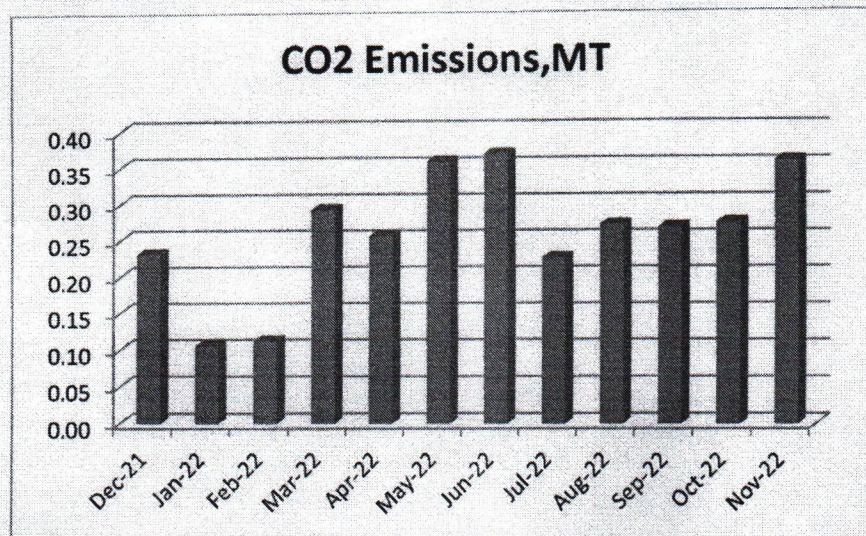


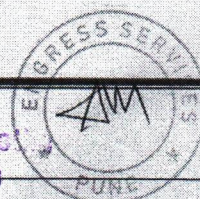
Table No 6: Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO ₂ Emissions, MT
1	Total	3473	3.13
2	Maximum	410	0.37
3	Minimum	118	0.11
4	Average	289.45	0.26



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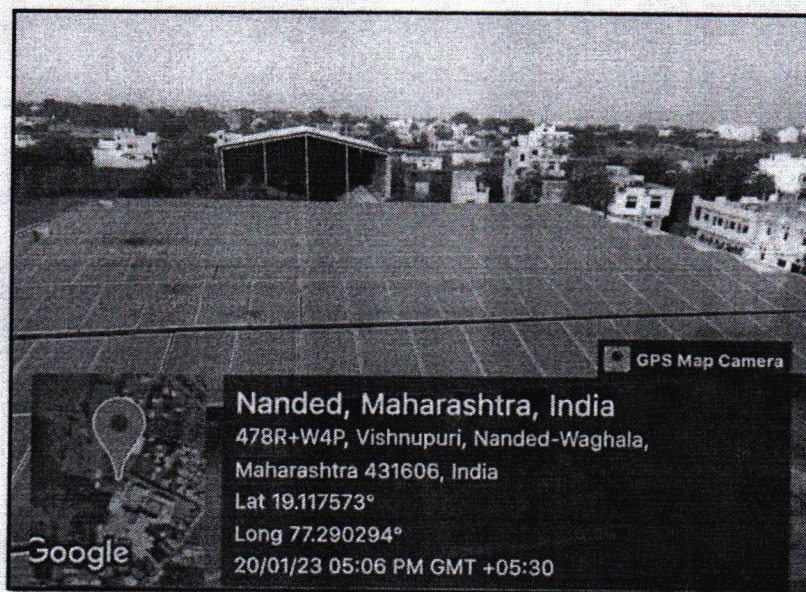
CHAPTER-V STUDY OF USAGE OF ALTERNATE ENERGY

The College has installed a 10 kWp capacity Roof top Solar PV Plant. Now we compute the Percentage of Alternate Energy to Annual Energy demand:

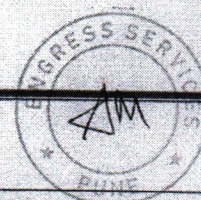
Table No 7: Percentage of Usage of Alternate Energy to Annual Energy Demand:

No	Particulars	Value	Unit
1	Energy purchased from MSEDCCL	3473	kWh/Annum
2	Capacity of Roof Top Solar PV Capacity	25	kWp
3	Average Energy Generated per kWp per Day	4	kWh/kWp
4	Daily Energy Generated	40	kWh/Day
5	Annual Generation Days	300	Nos
6	Annual Energy Generated	12000	kWh/Annum
7	Total Energy Requirement = (1) + (6)	15473	kWh/Annum
8	Percent of Alternate Energy to Annual Energy Requirement = $(6) \times 100 / (7)$	78	%

Photograph of Roof Top Solar PV Plant:



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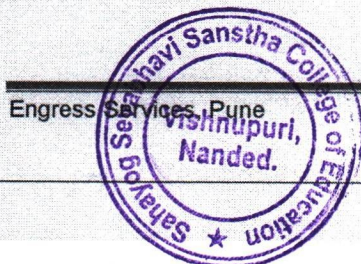


CHAPTER VI STUDY OF USAGE OF LED LIGHTING

In this chapter, we compute the percentage of usage of LED Lighting to Total Lighting Load, as under.

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

No	Particulars	Value	Unit
1	No of 40 W FTL Fittings	14	Nos
2	Load/Unit of 40 W FTL Fittings	40	W/Unit
3	Total Load of 40 W FTL Fittings	0.56	kW
4	No of 20 W LED Fittings	32	Nos
5	Load/Unit of 20 W LED Fittings	20	W/Unit
6	Total Load of 20 W LED Fittings	0.64	kW
7	Total LED Lighting Load= 6	1.2	kW
8	Total Lighting Load= 3+6	0.64	kW
9	% of Annual LED Lighting to Total Lighting Load= $7 \times 100 / 8$	53	%



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