GREEN AUDIT REPORT

of

Sinhgad Technical Education Society's

SINHGAD ACADEMY OF ENGINEERING

Kondhwa, Pune 411048

Sinhgad Institutes

Year: 2020-21

Prepared by

Enrich Consultants,

Yashashree, 26, Nirmal Bag Society

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ENRICH CONSULTANTS * Pune *

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
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Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
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ECN/2021-22/CR-14/1577 22nd April, 2021

CERTIFICATE OF REGISTRATION
FOR CLASS 'A'

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

Name and Address of the firm : **M/s Enrich Consultants**
Yashashree, Plot No. 26, Nirmal Bag Society,
Near Muktangan English School, Parvati,
Pune - 411009.

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

Registration Number : ***MEDA/ECN/2021-22/Class A/EA-03***

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **21st April, 2023** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

Enrich Consultants

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

Ref: EC/STESSAOE /02 Date: 8/9/2021

CERTIFICATE

This is to certify that we have conducted Green Audit at Sinhgad Technical Education Society's Sinhgad Academy of Engineering, Kondhwa, Pune 411048 in the Academic Year 2020-21.

The College has adopted Green practices:

- Usage of Energy Efficient LED Fittings
- Installation of 2.5 kWp Roof Top Solar PV Plant
- Installation of Roof Top 12000 LPD Solar Thermal Water Heating System
- Segregation of Waste at source
- Usage of Tumbler Units for conversion of organic Waste
- Installation of 150 m^3/Day Sewage Treatment Plant
- Maintenance of good internal roads in the campus
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of Awareness on Resource 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 *

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ACKNOWLEDGEMENT

We at Enrich Consultants, Pune, express our sincere gratitude to the management of Sinhgad Technical Education Society's Sinhgad Academy of Engineering, Kondhwa, Pune 411048 for awarding us the assignment of Green Audit of their Kondhwa Campus for the Year: 2020-21

We are thankful to the Head of Departments & Staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. Sinhgad Technical Education Society's Sinhgad Academy of Engineering, Kondhwa, Pune consumes Energy in the form of Electrical Energy used for various gadgets, Office & other facilities.

2. Present Energy Consumption & CO_2 Emission:

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	82333	74.10
2	Maximum	9241	8.32
3	Minimum	4619	4.16
4	Average	6861.10	6.17

3. Various measures adopted for Energy Conservation:

- Usage of LED Lights
- Installation of 10 kWp Roof Top Solar PV Plant
- Installation of 12000 LPD Solar Thermal Water Heating System.

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

- The College has installed Roof Top Solar PV Plant of Capacity 2.5 kWp.
- Energy generated by Roof Top Solar PV Plant is 3000 kWh.
- The Annual Reduction in CO_2 Emission in 20-21 2.7 MT

5. Waste Management:

5.1 Solid Waste Management:

The Dry and Wet waste is segregated at the source and is handed over to Authorized Agency for further disposal/recycling.

5.2 Organic Waste Management:

The College has Tumbler Units for conversion of Organic Waste into Bio Compost

5.3 Liquid Waste Management:

The College has installed 150 m^3/Day Sewage Treatment Plant. The treated Water is used for Gardening purpose.

5.4 E-Waste Management:

The E Waste generated is handed over to Authorized Agency for further disposal.

6. Rain Water Management:

The Rain Water falling on the terrace is run down through the Pipes and is used to in recharge the bore well.

7. Green & Sustainable Practices:

- The internal roads are good for easy movement of pedestrian
- The College has a well maintained garden.
- Provision of Ramp for Divyangajan
- Creation of awareness by Display of Posters on Resource Conservation

9. Notes & Assumptions:

1. 1 Unit of Electrical Energy releases 0.9 Kg of CO_2 into atmosphere
2. Annual Solar Energy Generation Days:300 Nos

10. References:

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

ABBREVIATIONS

STES	:	Sinhgad Technical Education Society
Kg	:	Kilo Gram
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
MT	:	Metric Ton
CO_2	:	Carbon Di Oxide

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 Practices
5. To Study Rain Water Harvesting
6. To Study Green & Sustainable Practices

1.2 Table No 1: General Details of College:

No	Head	Particulars
1	Name of Institution	Sinhgad Technical Education Society's Sinhgad Academy of Engineering
2	Address	Danny Mehta Nagar, Kondhwa, Pune 411 048
3	Affiliation	Savitribai Phule Pune University

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

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

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

No	Month	Energy Purchased, kWh
1	Jul-20	9241
2	Aug-20	8306
3	Sep-20	8803
4	Oct-20	7029
5	Nov-20	4803
6	Dec-20	5578
7	Jan-21	6924
8	Feb-21	8319
9	Mar-21	8827
10	Apr-21	5263
11	May-21	4619
12	Jun-21	4621
13	Total	82333
14	Maximum	9241
15	Minimum	4619
16	Average	6861.10

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

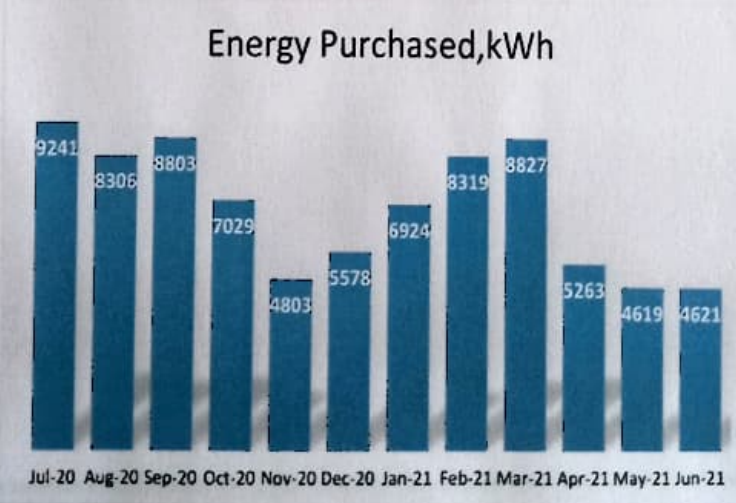


Table No 3: Various Important Parameters:

No	Parameter/ Value	Energy Consumed, kWh
1	Total	82333
2	Maximum	9241
3	Minimum	4619
4	Average	6861.10

CHAPTER III
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:

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

Table No 4: Month wise CO_2 Emissions:

No	Month	Energy Purchased, kWh	CO_2 Emissions, MT
1	Jul-20	9241	8.32
2	Aug-20	8306	7.48
3	Sep-20	8803	7.92
4	Oct-20	7029	6.33
5	Nov-20	4803	4.32
6	Dec-20	5578	5.02
7	Jan-21	6924	6.23
8	Feb-21	8319	7.49
9	Mar-21	8827	7.94
10	Apr-21	5263	4.74
11	May-21	4619	4.16
12	Jun-21	4621	4.16
13	Total	82333	74.10
14	Maximum	9241	8.32
15	Minimum	4619	4.16
16	Average	6861.10	6.17

Chart No 2: Representation of Month wise CO_2 Emissions:

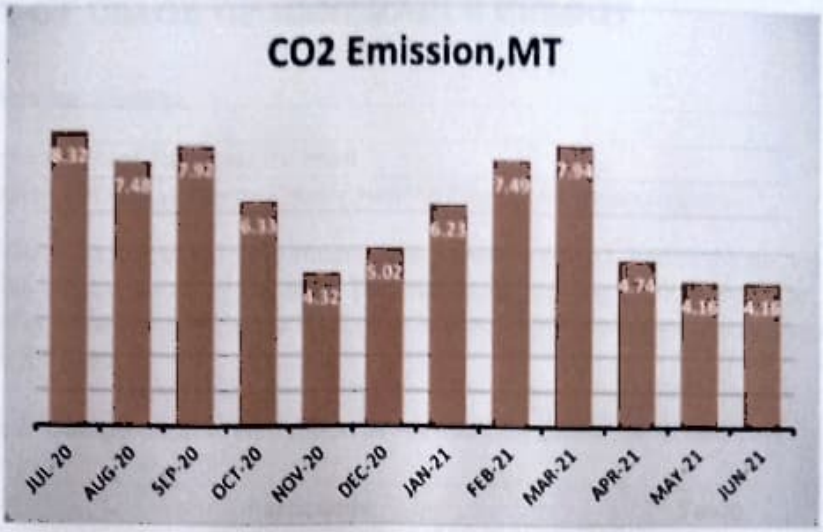


Table No 5: Various Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO2 Emissions, MT
1	Total	82333	74.10
2	Maximum	9241	8.32
3	Minimum	4619	4.16
4	Average	6861.10	6.17

CHAPTER IV
STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed:

- **2.5 kWp** Roof Top Solar PV Plant
- **12000 LPD** Solar Thermal Water Heating Plant at the Hostel Blocks.

Due to COVID-19, Lockdown, the Hostel blocks were not used, hence we do not take into account the Energy saved by the Solar Thermal Water Heating Plant in the Year: 20-21. In the following Table, we present the Reduction in Annual CO2 Emission due to usage of Roof Top Solar PV Plant.

Table No 6: Computation of Reduction in Annual CO_2 Emission in 20-21:

No	Particulars	Value	Unit
1	Capacity of Roof Top Solar PV Capacity	2.5	kWp
2	Average Energy Generated per kWp per Day	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated = 2*3*4	**3000**	kWh/Annum
5	1 kWh of Energy releases	**0.9**	Kg of CO_2
6	Annual Reduction in CO2 Emission = 4 * 5 /1000	**2.7**	**MT**

Photograph of Solar PV Plant and Solar Thermal Water Heating System:

CHAPTER V
STUDY OF WASTE MANAGEMENT

5.1 Solid Waste Management:

The Dry recyclable Waste & Wet Waste are collected on daily basis, and further given to Authorized Waste Collector for further disposal/Recycling.

Photograph of Waste Collection Bins:

5.2 Organic Waste Management:

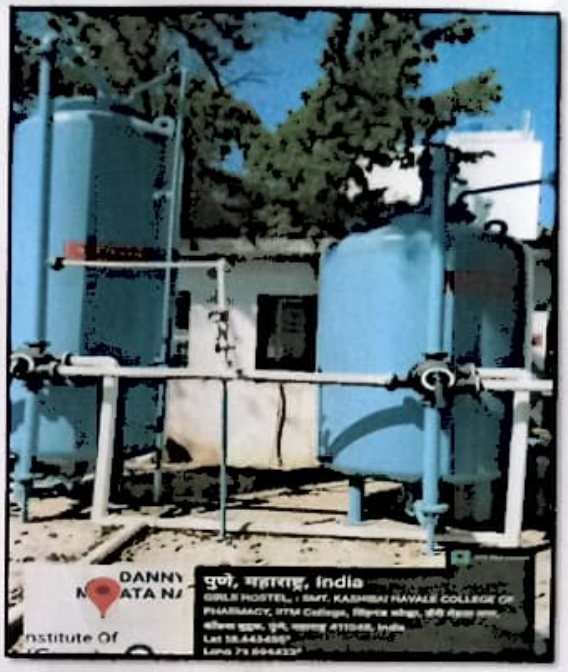
The College has Tumbler Arrangement for conversion of Organic Waste into Bio Compost

Photograph of Tumble Arrangement:

5.3 Liquid Waste Management:

The College has installed a **150 m^3/Day** Capacity Sewage Treatment Plant, to handle the human waste generated in the College.

Photograph of Sewage Treatment Plant:



5.4 E-Waste Management:

The E Waste generated is handed over to Authorized Agency for further disposal.

CHAPTER VI
STUDY OF RAIN WATER MANAGEMENT

The Rain Water falling on the terrace is run down through the Pipes and is used to in recharge the bore well.

Photograph of Rain Water Harvesting Pipe from Terrace:

Photograph of Rain Water Recharge Location:

CHAPTER VII
STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads:

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

Photograph of Internal Road inside the College Campus:

7.2 Green Landscaping and Tree Plantation:

The College has maintained plantation in the campus.

Photograph of Tree Plantation in the College campus:

7.3 Provision of Ramp:

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

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Photograph of Ramp:

7.4 Creation of Awareness on Resource Conservation:

The College has displayed Posters on Resource Conservation.

Photograph of Posters on Resource Conservation:

ANNEXURE-1
LIST OF TREES AND PLANTS IN THE CAMPUS

List of Trees:

No	Common Name Of Tree	Qty
1	Ficus	100
2	Arica palm	90
3	Bottle Palm	99
4	Kadunim	1
5	Christmas	1
6	Shankasur	1
7	Kanchan	1
8	**Total**	**293**