

GREEN AUDIT REPORT
of
**Shri Shivaji Education Society's,
ARTS & COMMERCE COLLEGE, JARUD,
Dist: Amravati 444 908**



Year: 2021-22

Prepared by:

ENGRESS SERVICES

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



MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(Government of Maharashtra Institution)
Aundh Road, Opposite Spicer College Road, Near Commissionerate of Animal Husbandary,
Aundh, Pune, Maharashtra 411067
Ph No: 020-35890450
Email: eeo@mahaaurja.com, Web: www.mahaaurja.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 Mukangan 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

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

Ref: ES/ACCJ/21-22/02

Date: 10/6/2022

CERTIFICATE

This is to certify that we have conducted Green Audit at Shri Shivaji Education Society's Arts & Commerce College, Jarud, Dist: Amravati in the Year 2021-22

The College has adopted following Green Initiatives:

- Usage of Energy Efficient LED Light Fitting
- Maximum Usage of Day Lighting
- Installation of Roof Top Solar PV Plant of Capacity 3 kWp
- Segregation of Waste at Source
- Implementation of Rain Water Management Project
- Maintenance of Good Internal Road
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of Awareness about 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 Engress Services,



A Y Mehendale,

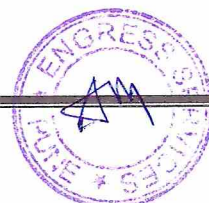
Certified Energy Auditor, EA-8192

ASSOCHAM GEM Certified Professional: GEM: 22/788



INDEX

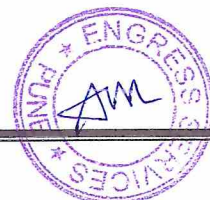
Sr. No	Particulars	Page No
I	Acknowledgement	5
II	Executive Summary	6
III	Abbreviations	8
1	Introduction	9
2	Study of Present Energy Consumption	10
3	Study of Carbon Foot Printing	12
4	Study of Usage of Renewable Energy	14
5	Study of Waste Management	15
6	Study of Rain Water Management	16
7	Study of Green & Sustainable Practices	17
	Annexure	
I	Details of Trees and Plants	19



ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Shri Shivaji Education Arts & Commerce College, Jarud, Dist: Amravati, for awarding us the assignment of Green Audit of their Campus for the Academic Year: 21-22.

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



EXECUTIVE SUMMARY

1. Shri Shivaji Education Society's Arts & Commerce College, Jarud, Dist: Amravati consumes Energy in the form of **Electrical Energy** used for various Electrical Equipment, office & other facilities.

2. Present Energy Consumption & CO₂ Emissions:

No	Parameter/ Value	Energy Purchased, kWh	CO ₂ Emissions, MT
1	Total	1834	1.65
2	Maximum	174	0.16
3	Minimum	121	0.11
4	Average	152.83	0.14

3. Various initiatives taken for Energy Conservation:

- Usage of Energy Efficient LED Lighting
- Maximum Usage of Day Lighting
- Installation of Roof Top Solar PV Plant of Capacity **3 kWp**.

4. Usage of Renewable Energy & CO₂ Emission Reduction:

- The College has installed Roof Top Solar PV Plant of Capacity **3 kWp**.
- The Electrical Energy generated in 21-22 is **3600 kWh**.
- Reduction in CO₂ Emissions in 21-22 is **3.24 MT**.

5. Waste Management:

5.1 Segregation of Waste at Source:

The Waste is segregated at source and the recyclable waste, like paper waste is handed over to Authorized Agency for further action.

5.2 Organic Waste Management:

It is recommended to convert the Organic Waste in to Bio Compost in a Bio Composting Pit.

5.3 E Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency

6. Rain Water Management:

The College has implemented the Rain Water Management Project. The College has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is stored in a well and is used for gardening.

7. Green & Sustainable Initiatives:

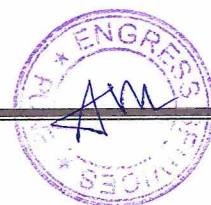
- Good Internal Road
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan
- Creation of Awareness about Resource Conservation by Display of Posters

8. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg of CO₂** into atmosphere
2. **1 kWp** Roof Top Solar PV Plant releases **4 kWh** of Electrical Energy per Day.
3. Annual Solar Energy Generation Days: **300 Nos.**

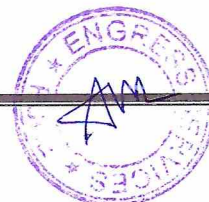
9. References:

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



ABBREVIATIONS

BEE	Bureau of Energy Efficiency
kWh	Kilo Watt Hour
LPD	Liters Per Day
Kg	Kilo Gram
MT	Metric Ton
CO ₂	Carbon Di Oxide
Qty	Quantity



CHAPTER-I INTRODUCTION

1.1 Objectives:

1. To study Present Energy Consumption
2. To Study CO₂ emissions
3. To study usage of Renewable Energy
4. Study of Waste Management
5. Study of Rain Water Harvesting
6. Study of Green & Sustainable Practices

1.2 General Details of College: Table No 1:

No	Head	Particulars
1	Name of Institution	Shri Shivaji Education Society's Arts & Commerce College
2	Address	Jarud, Dist: Amravati 444 908
3	Affiliation	Sant Gadgebaba Amravati University

1.3 Google Earth Image:



College
Campus

CHAPTER-II STUDY OF PRESENT ENERGY CONSUMPTION

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

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

No	Month	Energy Purchased, kWh
1	Apr-21	156
2	May-21	168
3	Jun-21	172
4	Jul-21	164
5	Aug-21	174
6	Sep-21	121
7	Oct-21	145
8	Nov-21	154
9	Dec-21	168
10	Jan-22	150
11	Feb-22	131
12	Mar-22	131
13	Total	1834
14	Maximum	174
15	Minimum	121
16	Average	152.83

Chart No 1: Variation in Monthly Energy Purchased:

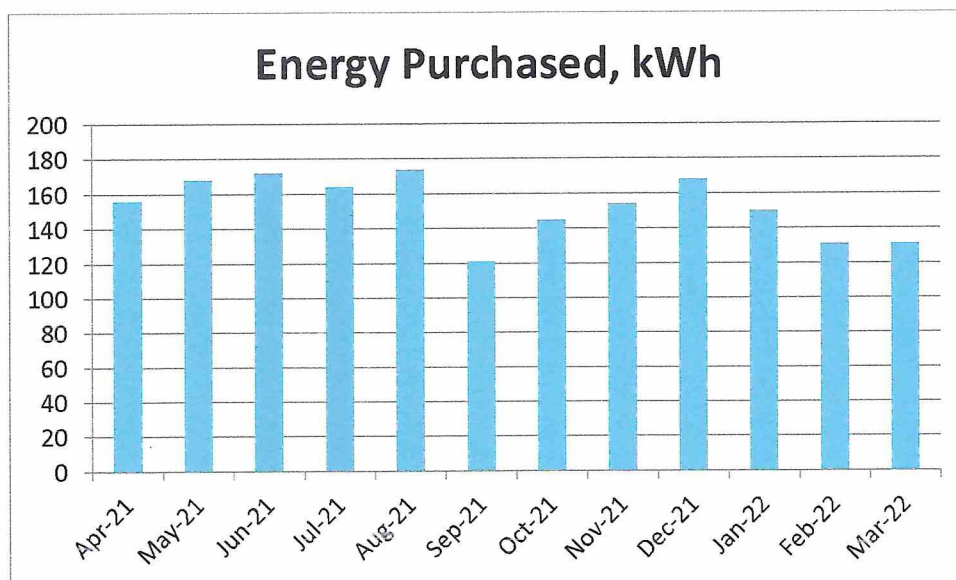
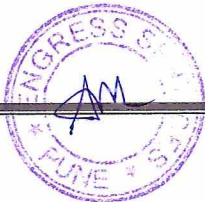


Table No 3: Variation in Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh
1	Total	1834
2	Maximum	174
3	Minimum	121
4	Average	152.83



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 as the Energy Source.

Basis for computation of CO₂ Emissions:

- 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 4: Month wise CO₂ Emissions:

No	Month	Energy Purchased, kWh	CO ₂ Emissions, MT
1	Apr-21	156	0.14
2	May-21	168	0.15
3	Jun-21	172	0.15
4	Jul-21	164	0.15
5	Aug-21	174	0.16
6	Sep-21	121	0.11
7	Oct-21	145	0.13
8	Nov-21	154	0.14
9	Dec-21	168	0.15
10	Jan-22	150	0.14
11	Feb-22	131	0.12
12	Mar-22	131	0.12
13	Total	1834	1.65
14	Maximum	174	0.16
15	Minimum	121	0.11
16	Average	152.83	0.14



Chart No 2: Month wise CO₂Emissions:

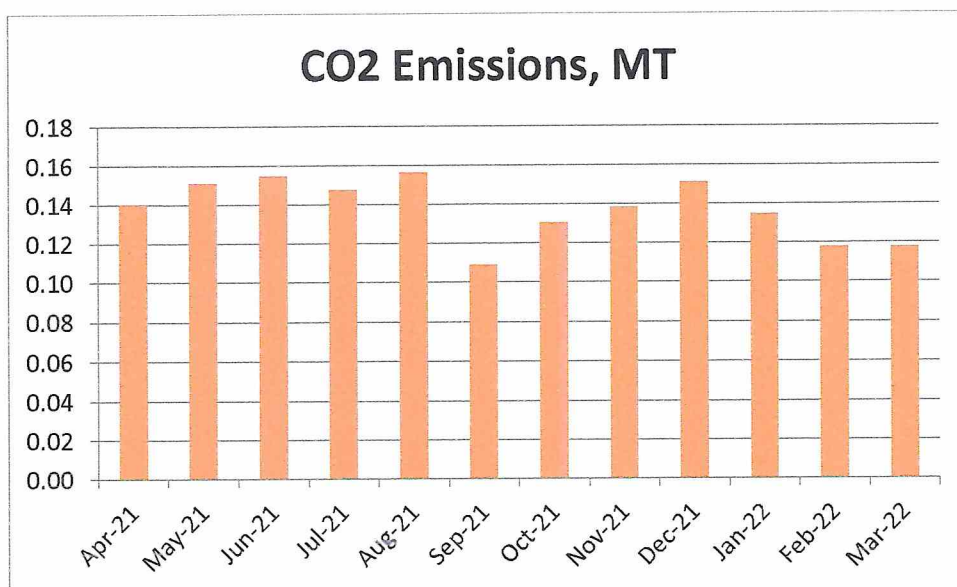
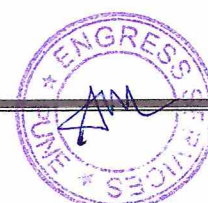


Table No 5: Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO ₂ Emissions, MT
1	Total	1834	1.65
2	Maximum	174	0.16
3	Minimum	121	0.11
4	Average	152.83	0.14



CHAPTER IV STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed Roof Top Solar PV Plant of Capacity 3 kWp.

In the following Table, we compute the Annual Reduction in CO₂ Emissions due to installation of Roof Top Solar PV Plant.

Table No 6: Computation of Annual Reduction in CO₂ Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	3	kWp
2	Energy Generated in per kWp	4	4 kWh/kWp
3	Annual Solar Energy generation Days	300	Nos
4	Energy Generated in the Year: 21-22	3600	kWh
5	1 kWh of Electrical Energy saves	0.9	Kg/kWh
6	Qty of CO ₂ Saved by Solar PV Plant $= (4) * (5) / 1000$	3.24	MT of CO ₂

Photograph of Roof Top Solar PV Plant:



CHAPTER V STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The Waste is segregated at source and the recyclable waste, like paper waste is handed over to Authorized Agency for further action.

Photograph of Waste Collection Bin:



5.2 Organic Waste Management:

It is recommended to convert Organic Waste into Bio compost in a Bio Composting Pit.

5.3 E Waste Management:

It is recommended to dispose of the E Waste through Authorized Agency.

CHAPTER-VI STUDY OF RAIN WATER MANAGEMENT

The College has implemented the Rain Water Management Project. The College has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is stored in a well and is used for gardening.

Photograph of Rain water Harvesting Pipe:



Rain Water
Collecting Pipe

CHAPTER-VII STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads:

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

Photograph of Internal Road:



7.2 Internal Tree Plantation:

The College has well maintained Tree Plantation in the campus.

Photograph of Tree plantation:



7.3 Provision of Ramp:

For easy movement of Divyangajan, the College has made provision of Ramp.

Photograph of Ramp:



7.3 Creation of Awareness by Display of Posters:

In order to create Awareness about Resource Conservation, Display Posters are placed.

Photograph of Poster on Water Conservation:



ANNEXURE: I DETAILS OF TREES IN THE CAMPUS

1. List of Trees:

No.	Common Name of Tree
1	Terminalia catappa
2	Tectona grandis
3	Ficus religiosa
4	Delonix regia
5	Azadirachata indica
6	Bixa Orellana
7	Dalbergia sissoo
8	Phyllantusemblica
9	Sapindusmukorossi
10	Ficus benghalensis
11	Arecaceae
12	Ficus recemosa
13	Saracaasoca
14	Tamarindus indica
15	Cassia fistula
16	Ficus benghalensis L
17	Vachellianilotica
18	Ziziphus mauritiana
19	Catharanthus roseus
20	Ehretialaevis
21	Mimusopselengi
22	Annona squamosal
23	Azadirachata indica
24	Bougainvillea
25	Catharanthus roseus
26	Borassus flabellifer
27	Arecaceae
28	Jasminum sambac
29	Saracaasoca
30	Lawsoniainermis
31	Mangifera indiaca L.
32	Thuja
33	Bougainvillea
34	Azadirachataindiaca