

**Jayawant Shikshan Prasarak Mandal's
Bhivarabai Sawant Institute of Technology & Research
Wagholi, Pune – 412 207**

Environmental Consciousness and Sustainability

Solid Waste Management:

College manages Solid-waste, by collecting, treating, and disposing of solid material that is discarded because it has served its purpose or is no longer useful. For this institute has a dedicated vehicle.



Fig. Vehicle carrying Solid Waste

Liquid waste management

Institute has been working and planning towards making environment friendly and healthy in every possible way. Sewage Treatment Plant is imbibed in the campus for the same.

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Fig: Sewage Water Treatment Plant in the Campus

E-waste management

Institute emphasizes on "E-waste management by decomposing some electronic products contain materials that are hazardous, depending on their condition and density. Importance of E-waste disposal techniques is percolated amongst the students and this practice is carried on routine basis.



GREEN AUDIT REPORT
of
**JAYAWANT SHIKSHAN PRASARAK MANDAL'S,
BHIVARABAI SAWANT INSTITUTE OF TECHNOLOGY &
RESEARCH,
WAGHOLI, PUNE**



Year: 2021-22

Prepared by:

ENGRESS SERVICES

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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 Muktangian English School,
Parvati, Pune - 411 009.

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

Registration Number : *MEDA/ECN/2022-23/Class AEA-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 (FC)



ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society,
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Tel: 09890444795 Email: enrichcons@gmail.com

Ref: ES/BSIOTR/21-22/02

Date: 10/5/2022

CERTIFICATE

This is to certify that we have conducted Green Audit at, Jayawant Shikshan Prasarak Mandal's Bhivarabai Sawant Institute of Technology & Research, Wagholi, Pune, in the Academic year 2021-22.

The Institute has adopted following Green Initiatives:

- Usage of Energy Efficient LED Light Fitting
- Usage of BEE STAR Rated Energy Efficient Equipment
- Maximum Usage of Day Lighting
- Installation of Roof Top Solar PV Plant of Capacity 13 kWp
- Segregation of Waste at Source
- Installation of Organic Converter Unit to convert the organic Waste
- Installation of Sewage Treatment Plant of Capacity 500 m³/Day
- Maintenance of Good Internal Road
- Tree Plantation in the campus
- Provision of Ramp for Divyangajan

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



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 Harvesting	17
7	Study of Green & Sustainable Practices	18
	Annexure	
I	List of Trees & Plants in the campus	20

ACKNOWLEDGEMENT

We Engress Services, Pune, express our sincere gratitude to the management of Jayawant Shikshan Prasarak Mandal's Bhivarabai Sawant Institute of Technology & Research Wagholi, Pune for awarding us the assignment of Green Audit of their Campus for the Year: 2021-22.

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

EXECUTIVE SUMMARY

1. Jayawant Shikshan Prasarak Mandal's Bhivarabai Sawant Institute of Technology & Research, Wagholi, Pune 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	80281	72.25
2	Maximum	9812	8.83
3	Minimum	4785	4.31
4	Average	6690	6.0

3. Various initiatives taken for Energy Conservation:

- Usage of Energy Efficient BEE STAR Rated Equipment
- Usage of Energy Efficient LED Lighting
- Maximum Usage of Day Lighting
- Installation of Roof Top Solar PV Plant of Capacity 13 kWp.

4. Usage of Renewable Energy:

- The Institute has installed Roof Top Solar PV Plant of Capacity **13 kWp**.
- The Electrical Energy generated in 21-22 is **15600 kWh**.
- Reduction in CO₂ Emissions in 21-22 works out to be **14.04 MT**.

5. Waste Management:

5.1 Segregation of Waste at Source:

The recyclable waste, like paper, plastic waste is segregated at source and handed over to Authorized waste collecting agent for further recycling.

5.2 Organic Waste Management:

The Institute has installed an Organic Waste Converter Unit and the organic Waste is converted into compost, which is further used in the own garden.

5.3 Liquid Waste Management:

The Institute has installed a Sewage Treatment Plant of Capacity 500 m³/Day. The treated Water is used for internal gardening purpose.

5.4 E-Waste Management:

The E-Waste is disposed of through Authorized E-Waste collecting agency.

6. Rain Water Harvesting:

The Institute has installed the Rainwater harvesting project; wherein the rain water falling on the terrace and slopes is collected and is used for recharging the bore well.

7. Green & Sustainable Initiatives

- Maintenance of good Internal Road
- Maintenance of Internal Garden
- Provision of Ramp for Divyangajan

8. Notes & Assumptions:

- 1 kWh of Electrical Energy releases 0.9 Kg of CO₂ into atmosphere
- 1 kWp of Solar PV Plant generates 4 kWh of Electrical Energy per day
- Annual Solar 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 Institute: Table No 1:

No	Head	Particulars
1	Name of Institution	Jayawant Shikshan Prasarak Mandal's Bhivarabai Sawant Institute of Technology & Research
2	Address	Wagholi, Pune
3	Year of Establishment	2009
4	Affiliation	Savitribai Phule Pune University

1.3 Google Earth Image:



Institute
Campus

CHAPTER-II

STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Electricity Bills

Table No 2: Electrical Bill Analysis- 2021-22:

No	Month	Energy Purchased, kWh
1	Apr-21	5912
2	May-21	4936
3	Jun-21	4785
4	Jul-21	7511
5	Aug-21	6709
6	Sep-21	7667
7	Oct-21	7787
8	Nov-21	7567
9	Dec-21	9812
10	Jan-22	6512
11	Feb-22	5785
12	Mar-22	5298
13	Total	80281
14	Maximum	9812
15	Minimum	4785
16	Average	6690

Chart No 1: Variation in Monthly Energy Purchased:

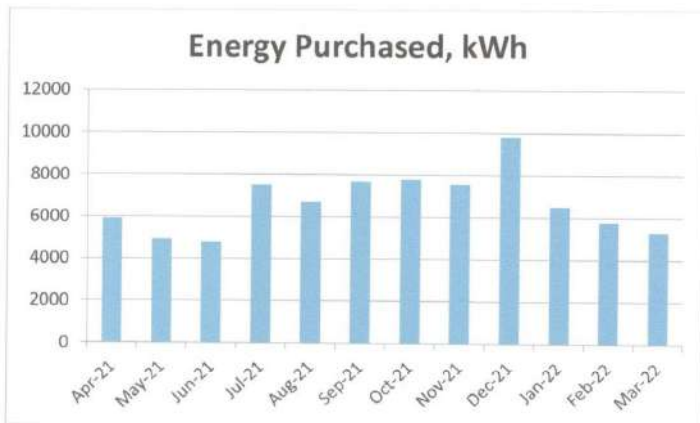


Table No 3: Variation in Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh
1	Total	80281
2	Maximum	9812
3	Minimum	4785
4	Average	6690

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 Institute for performing its day to day activities

The Institute 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 Institute due to its Day to Day operations

Table No4: Month wise CO₂ Emissions:

No	Month	Energy Purchased, kWh	CO ₂ Emissions, MT
1	Apr-21	5912	5.32
2	May-21	4936	4.44
3	Jun-21	4785	4.31
4	Jul-21	7511	6.76
5	Aug-21	6709	6.04
6	Sep-21	7667	6.90
7	Oct-21	7787	7.01
8	Nov-21	7567	6.81
9	Dec-21	9812	8.83
10	Jan-22	6512	5.86
11	Feb-22	5785	5.21
12	Mar-22	5298	4.77
13	Total	80281	72.25
14	Maximum	9812	8.83
15	Minimum	4785	4.31
16	Average	6690	6.0

Chart No 2: Month wise CO₂Emissions:

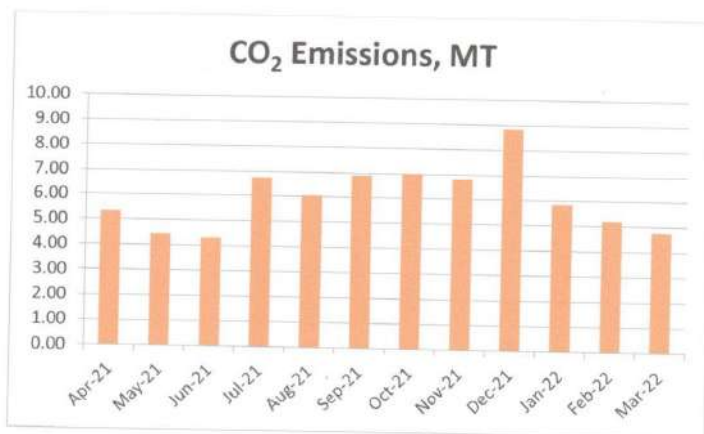


Table No 5: Variation in Important Parameters:

No	Parameter/ Value	Energy Purchased, kWh	CO ₂ Emissions, MT
1	Total	80281	72.25
2	Maximum	9812	8.83
3	Minimum	4785	4.31
4	Average	6690	6.0

CHAPTER IV STUDY OF USAGE OF RENEWABLE ENERGY

The Institute has installed Roof Top Solar PV Plant of Capacity 13 kWp.

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

Table No6: Computation of Annual Reduction in CO₂ Emissions:

No	Particulars	Value	Unit
1	Installed Capacity of Roof Top Solar PV Plant Capacity	13	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	15600	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	14.04	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 recyclable waste, like paper waste is segregated at source and is handed over to authorized waste collecting agent for further recycling.

Photograph of Waste Collection Bins:



5.2 Organic Waste Management:

The Institute has installed an Organic Waste Converter Unit and the organic Waste is converted into compost, which is further used in the own garden.

Photograph of Organic Converter Unit:



5.3 Liquid Waste Management:

The Institute has installed a Sewage Treatment Plant of Capacity 500 m³/Day. The treated water is used for internal gardening purpose.

Photograph of Sewage Treatment Plant:



5.4 E-Waste Management: The E-Waste is disposed of through Authorized Agency.

CHAPTER-VI STUDY OF RAIN WATER HARVESTING

The Institute has implemented the Rain Water Harvesting Project. The College has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to recharge the bore well.

Photograph of Rain water Harvesting Pipe and Bore well Recharge Section:



CHAPTER-VII STUDY OF GREEN & SUSTAINABLE PRACTICES

7.1 Pedestrian Friendly Roads:

The Institute 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 Institute has well maintained landscaped garden in the campus.

Photograph of Tree plantation:



7.3 Provision of Ramp:

For easy movement of Divyangajan, the Institute has made provision of Ramp at the main entrance.

Photograph of Ramp:



ANNEXURE-1:**LIST OF TREES & PLANTS IN THE CAMPUS:**

No	Name of the Tree	Biological Name of Tree	Qty
1	GULMOHAR	PEACOCKFLOWER	83
2	ARECAPALM	ARECAPALM	1938
3	BOTTLEPALM	BOTTLEPALM/ROYALPALM	274
4	JASWAND	HIBISCUS	64
5	TAGAR	CRAPEJASMIN/PINWHEEL	18
6	PERU	GUAVA	16
7	SAPTPARNI	DEVILTREE	78
8	KADULIMB	NEEMTREE	53
9	LIMBU	LEMONTREE	6
10	GULAB	ROSE	48
11	SHEVAGA	DRUMSTICKTREE/HORSERADISH	4
12	CHRISTMAS	CHRISTMASTREE	14
13	UMBAR	CLUSTERFIG TREE	6
14	SHEVARI	SILKCOTTONTREE	37
15	AMBA	MANGOTREE	6
16	PARIJATAK	CORALJASMIN	23
17	RUBBER	RUBBERFIG	8
18	SURU	BEEFWOOD/SURU	44
19	KADAMBA	BURFLOWERTREE	24
20	ASHOK	MASTTREE	9
21	BADAM	ALMOND	107
22	TIKUMA	SALTREE	1479
23	MOHAGUNI	MAHOGANY	79
24	PIMPAL	SACREDFIG	3
25	KARANJI	KARANJITREE	16
26	CHANDAN	SANDALWOOD	4
27	CHINCH	TAMARINDTREE	5
28	JAMBAL	JAVAPLUM	6
29	MORPANKHI	THUJA	23
30	SADAFULI	PERIWINKLE	5
31	VAD	BANYANTREE	2
32	BOR	JAJUBETREE	1
33	UMBAR	CLUSTERFIG TREE	4
34	MOGARA	JASMIN	7
35	JANGALIJHADE	JUNGLETREE	42
36	BAKUL	BULLETWOOD/INDIANMEDALLAR	1
37	KADIPATA	CURRYTREE	1
38	ANJIR	FIG	1
39	RUI	GIANTMILKWOOD	1
40	MEHANDI	HENNATREE	1
41	AAVALA	INDIANGOOSEBERRY	2