

Report on Green Audit: Shri Shivaji Education Society, Amravati's Jijamata Mahavidyalaya Buldana

**Report
On
Green Audit
At**



**Shri Shivaji Education Society, Amravati's
Jijamata Mahavidyalaya Buldana**



(Year 2019-20)

Prepared by

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CERTIFICATE

This is to certify that we have conducted Green Audit at Shri Shivaji Education Society,
Amravati's Jijamata Mahavidyalaya Buldana for the year 2019–20.

The College has already adopted **Green** practices like:

- Installation of Rain Water Harvesting system
- Installation of Bio composting pit
- Usage of Energy Efficient LED
- Usage of Energy Efficient BEE STAR Rated equipment

We appreciate the support of Management, involvement of faculty members and students in the process
of making the campus Green.

Nutan Urja Solutions,



K G Bhatwadekar,

Certified Energy Auditor,

EA - 22428



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Acknowledgement

We at Nutan Urja Solutions, Pune, express our sincere gratitude to the management of Shri Shivaji Education Society, Amravati's Jijamata Mahavidyalaya, Buldana for awarding us the assignment of Green Audit of their college premises.

We are also thankful to various Head of Departments & other Staff members for helping us during the field measurements.

We hope that the recommendations stated in this report will be useful and worthy of discussions to take things forward to help implementation of energy conservation measures and green practices. While we have made every attempt to adhere to high quality standards, in both data collection and analysis through the report, we would welcome your suggestions so as to improve upon this report further.



Executive Summary

Green Audit of Shri Shivaji Education Society, Amravati's Jijamata Mahavidyalaya Buldanam is conducted by Nutan Urja Solutions, Pune. Based On the audit field study, following important points can be presented.

1. Present Energy Consumption

Shri Shivaji Education Society, Amravati's Jijamata Mahavidyalaya Buldana uses Electrical Energy as the source of Energy for various equipment in the college campus. In the following Table, we present the details of Energy Consumption.

Table no 1: Details of energy consumption

Sr no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	2,037	1.63
2	Minimum	942	0.75
3	Average	1,329	1.06
4	Total	15,954	12.76

2. Various Measures Adopted for Energy Conservation

1. Usage of STAR Rated ACs at new installations
2. Usage of LED lights at some indoor locations
3. Usage of LED Lights for outdoor lighting.

3. Rain Water Harvesting

The College has installed the Rainwater harvesting project, to reduce dependency on municipal corporation water supply.

4. Waste Management

The College has already installed a Bio composting Plant, wherein, the bio-degradable waste is composted & is used as fertilizer for the garden.

The internal communication is through emails and hence there is hardly any generation of e-Waste in the premises.

5. Notes and Assumptions

1. Daily working hours-10 Nos



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2. Annual working Days-250 Nos
3. Average Rate of Electrical Energy : **Rs 11/- per kWh**



Abbreviations

CFL	: Compact Fluorescent Lamp
FTL	: Fluorescent Tube Light
LED	: Light Emitting Diode
V	: Voltage
I	: Current
kW	: Kilo- Watt
kWh	: kilo-Watt Hour
kVA	: Active Power



1. Introduction

Jijamata Mahavidyalaya Buldana is run by Shri Shivaji Education Society, Amravati founded by a great visionary, Educationist and first Agricultural Minister of India, Late Dr. Panjabrao alias Bhausaheb Deshmukh in 1956. The college started with Arts faculty, Later commerce faculty was added in 1964. Faculty of science is started in 1984. Since then the college is imparting education in the faculty of Arts. Commerce and Science, Junior College, MCVC to Graduation, Post-Graduation and Doctoral Research Programs. College has competent staff. College has well equipped Laboratories, rich central & departmental library, beautiful campus, hostel and a vast playground. University Grants Commission, New Delhi has awarded the status of "College with Potential for Excellence" in 2010.

1.1 Objectives

1. To study present level of Energy Consumption
2. To Study the present CO₂ emissions
3. To assess the various equipment/facilities from Energy efficiency aspect
4. To measure various Electrical parameters
5. To study Scope for usage of Renewable Energy
6. To study various measures to reduce the Energy Consumption

1.2 Audit methodology

1. Study of connected load
2. Study of various Electrical parameters
3. To prepare the Report with various Encon measures with payback analysis



2. Study of Electrical Energy Consumption

In this chapter, electricity bills are studied for the analysis of electrical energy consumption.

Table no 2.1: Summary of electricity bills

No	Month	Energy (kWh)	Bill Amount (Rs)
1	Jul-20	942	6594
2	Jun-20	1,660	12,367
3	May-20	1,568	11,917
4	Apr-20	1,017	7,424
5	Mar-20	1,169	9,118
6	Feb-20	1,020	8,058
7	Jan-20	1,192	9,770
8	Dec-19	1,297	10,506
9	Nov-19	2,037	17,420
10	Oct-19	1,950	15,990
11	Sep-19	1,146	8,538
12	Aug-19	956	7,074
	Total	15954	124776

Variation in energy consumption is as follows,



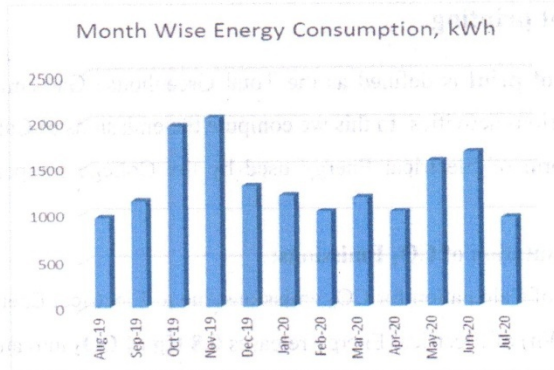


Figure 2.1: Month wise energy consumption

Monthly variation in electricity bill is as follows,

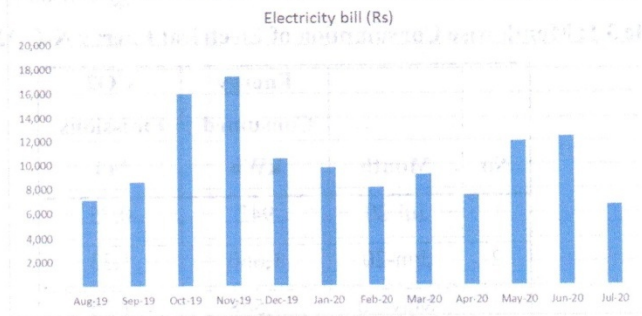


Figure 2.2: Month wise electricity bill

Key observations of electricity bill are as follows,

Table no 2.2: Key observations

Sr no	Parameter	Energy consumed, (Units)	CO2 Emission (MT)
1	Maximum	2,037	1.63
2	Minimum	942	0.75
3	Average	1,329	1.06
4	Total	15,954	12.76



3. Carbon Foot printing

1. A **Carbon Foot print** is defined as the Total Greenhouse Gas emissions (CO₂ emissions), emitted due to various activities. In this we compute the emissions of Carbon-Di-Oxide, by usage of the various form of Electrical Energy used by the College for performing its day to day activities

2. Basis for computation of CO₂ Emissions:

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

- 1 Unit (kWh) of Electrical Energy releases **0.8 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

We herewith furnish the details of various forms of Energy consumption as under

Table 3.1: Month wise Consumption of Electrical Energy & CO₂ Emissions

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Jul-20	942	0.75
2	Jun-20	1,660	1.33
3	May-20	1,568	1.25
4	Apr-20	1,017	0.81
5	Mar-20	1,169	0.94
6	Feb-20	1,020	0.82
7	Jan-20	1,192	0.95
8	Dec-19	1,297	1.04
9	Nov-19	2,037	1.63
10	Oct-19	1,950	1.56
11	Sep-19	1,146	0.92
12	Aug-19	956	0.76
	Total	15,954	12.76

In the following Chart we present the CO₂ emissions due to usage of Electrical Energy.



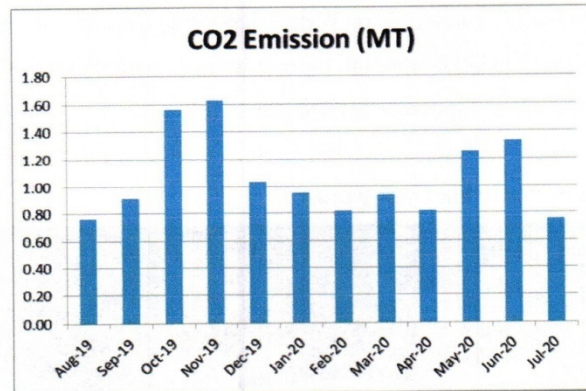


Figure 3.1: Month wise CO2 Emission



4. Study of Rain Water Harvesting

The College has already installed Rain Water Harvesting project, wherein the rain water falling on the terrace is collected and through pipes it is fed to underground Water Storage tank. This stored water is then reused for domestic purpose.

Photograph of Rain Water harvesting pipe



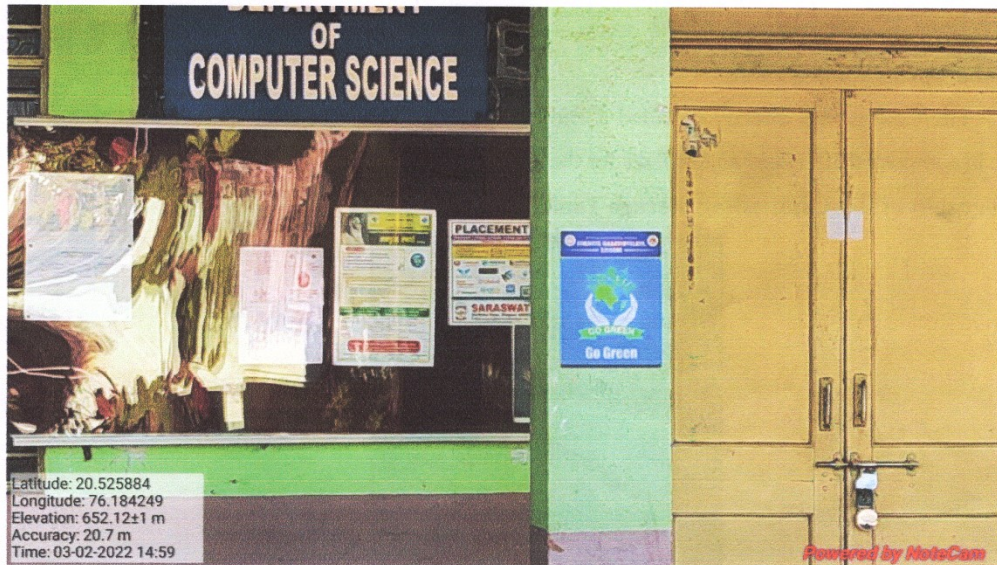
5. Study of Waste Management

5.1 Solid Waste Management

The College has already installed a Bio composting Plant, wherein, the bio-degradable waste is composted & is used as fertilizer for the garden.

Photographs of Bio Composting Storage Tanks:





5.2 e-Waste Management

The internal communication is through emails and there is hardly any generation of e-Waste in the premises.

Generated e-waste is disposed through proper agency.



6. Study of Green Practices

6.1 No of students who don't use own Vehicle for coming to Institute

Out of total students coming to Institute, about 60% students use own Automobile.

6.2 Usage of Public Transport

During the Students transport study, it was revealed that the local students who are residing near areas make use of Public Transport like Municipal Transport local buses, local sharing type auto rickshaws. Some students use bicycles.

6.3 Pedestrian Friendly Roads

The Institute has well defined pedestrian foot paths as to facilitate the easy movement of the students within the campus.

Photograph of Road within campus



6.4 Plastic Free Campus

The Institute is an active participant in the Government of India's most prestigious project of SWATCHH BHART ABHIYAN. The Institute has displayed boards in the Campus, to make the campus plastic free. Various measures adopted for this purpose are as follows

- Installation of Separate waste bins for Dry waste & wet waste
- Usage of paper tea cups in the Institute canteen
- Display of boards in the campus for Plastic Free campus





6.5 Paperless Office

The internal communication of the Institute is through the Internet. There are hardly any day to day operations, where printing is required.



7. Green Landscaping with Trees and Plants

To understand the plant biodiversity of the campus, the college has been conducting census of tree, herbs and shrubs. The college campus has rich plant biodiversity including more than 40 tree species. List of trees is given in following table.

Table 7.1 List of trees in college campus

SR. No.	Name	Botanical Name	Number
1	Kadulimb	<i>Azadirachta indica</i>	14
2	Ashoka	<i>Saraca asoca</i>	24
3	Charoli	<i>Buchanania lanzan</i>	02
4	Shisam	<i>Dalbergia sissoo</i>	05
5	Bakan	<i>Melia azedarach</i>	02
6	Medshingi	<i>Dolichandroma falcate</i>	03
7	Palas pangram	<i>Alstonia scholaris</i>	03
8	Pimple	<i>Ficus reigiosa</i>	02
9	Behada	<i>Terminalia bellirica</i>	02
10	Kaddu	<i>Kigelia Africana</i>	08
11	Jambhul	<i>Syzygium cumini</i>	02
12	Pimpri	<i>Ficus amplissima</i>	01
13	Chadrajyoti	<i>Jatropha curcas</i>	01
14	Subabhul	<i>Leucaena leucocephala</i>	03
15	Maharukh	<i>Ailanthus excels</i>	08
16	Gulmohar	<i>Delonix regia</i>	07
17	Kashid	<i>Peltophorum pterocarpum</i>	65
18	Chinch	<i>Tomarindus indica</i>	01
19	Rui	<i>Calatropis procera</i>	01
20	Botal brush	<i>Callistemon viminalis</i>	01
21	Palas	<i>Butea monosperma</i>	04
22	Tekoma(ghantiful)	<i>Tecoma stan</i>	02
23	Kanchan	<i>Bauhinia variegata</i>	02
24	Chandan	<i>Santalum album</i>	06
25	Nilgiri	<i>Eucalyptus globulas</i>	47
26	Babhul	<i>Vachellia nilotica</i>	23
27	Sadada	<i>Terminalia arjuna</i>	02
28	Vad	<i>Ficus benghalensis</i>	01
29	Bilayat chinch	<i>Pithecellobium dulce</i>	02
30	Hivar	<i>Vachellia leucophloea</i>	02
31	Kesjhabhuj	<i>Achyranthes aspera</i>	06
32	Bamboo	<i>Bambusa vulgaris</i>	01
33	Karanj	<i>Milletia pinnata</i>	01
34	Botal pam	<i>Hyophorbe lagenicaulis</i>	02
35	Saru	<i>Casuarina equisetifolia</i>	11



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36	Badam	<i>Terminalia catappa</i>	02
37	Sag	<i>Tectona grandis</i>	23
38	Amba	<i>Mangifera indica</i>	05
39	Saptparni	<i>Alstonia scholaris</i>	01
40	Sitafal	<i>Annona squamosa</i>	01
41	Satpuda		01
42	Vavadi	<i>Biancheae sappan</i>	01



Photograph of Garden Develop by College

