

Report on Green Audit: ShriShivaji Education Society, Amravati's JijamataMahavidyalayaBuldana

**Report  
On  
Green Audit  
At**



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



**(Year 2018-19)**

Prepared by

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NutanUrja Solutions, Pune.



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Date: 20/08/2019

### CERTIFICATE

This is to certify that we have conducted Green Audit at Shri Shivaji Education Society, Amravati's Jijamata Mahavidyalaya Buldana for the year 2018-19.

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,

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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	1,660	1.33
2	Minimum	588	0.47
3	Average	1,191	0.95
4	Total	14,287	11.43

### 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 CO<sub>2</sub> 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

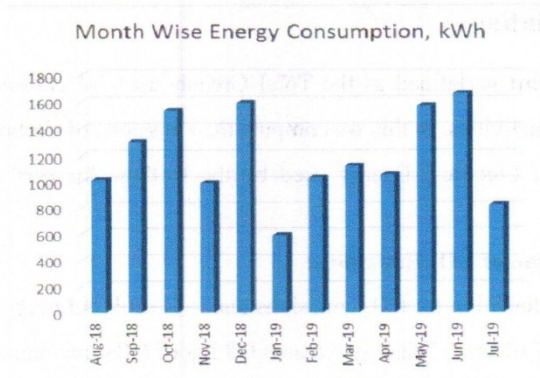
In this chapter, electricity bills are studied for the analysis of electrical energy consumption.

**Table no 2.1: Summary of electricity bills**

No	Month	Energy (kWh)	Bill Amount (Rs)
1	Jul-19	821	6075
2	Jun-19	1660	10458
3	May-19	1568	10035
4	Apr-19	1059	6884
5	Mar-19	1131	8143
6	Feb-19	1034	7548
7	Jan-19	588	4351
8	Dec-18	1589	11759
9	Nov-18	990	7425
10	Oct-18	1532	11643
11	Sep-18	1298	10124
12	Aug-18	1017	8034
	<b>Total</b>	<b>14287</b>	<b>102480</b>

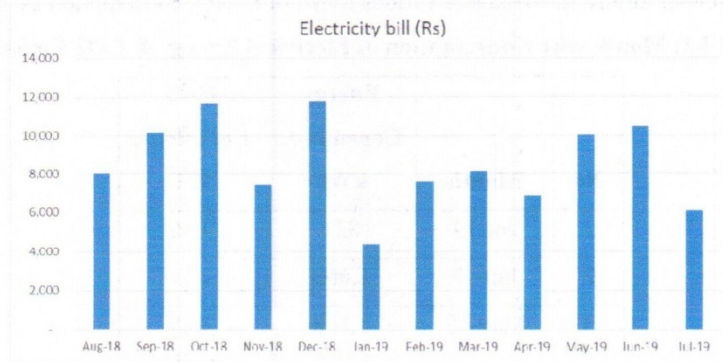
Variation in energy consumption is as follows,





**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	1,660	1.33
2	Minimum	588	0.47
3	Average	1,191	0.95
4	Total	14,287	11.43



### 3. Carbon Foot printing

1. A **Carbon Foot print** is defined as the Total Greenhouse Gas emissions (CO<sub>2</sub> 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 CO<sub>2</sub> Emissions:

The basis of Calculation for CO<sub>2</sub> emissions due to Electrical Energy is as under

- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO<sub>2</sub>** into atmosphere.

Based on the above Data we compute the CO<sub>2</sub> 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 & CO<sub>2</sub> Emissions**

No	Month	Energy Consumed, kWh	CO <sub>2</sub> Emissions, MT
1	Jul-19	821	0.66
2	Jun-19	1,660	1.33
3	May-19	1,568	1.25
4	Apr-19	1,059	0.85
5	Mar-19	1,131	0.90
6	Feb-19	1,034	0.83
7	Jan-19	588	0.47
8	Dec-18	1,589	1.27
9	Nov-18	990	0.79
10	Oct-18	1,532	1.23
11	Sep-18	1,298	1.04
12	Aug-18	1,017	0.81
	<b>Total</b>	<b>14,287</b>	<b>11.43</b>

In the following Chart we present the CO<sub>2</sub> emissions due to usage of Electrical Energy.



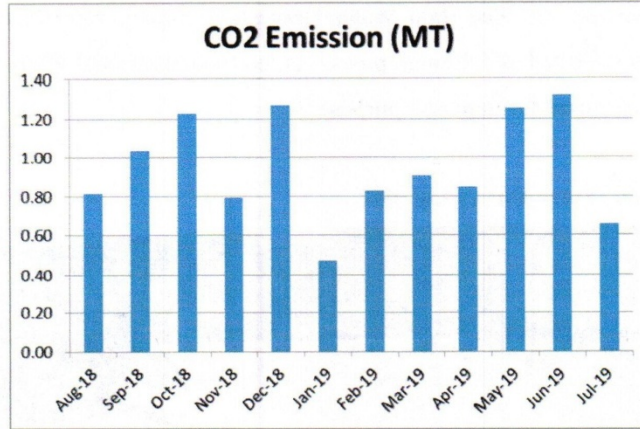


Figure 3.1: Month wise CO2 Emission



#### 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 25 tree species. List of trees is given in following table.

**Table 7.1 List of trees in college campus**

Sr. no	Common name	Biological source
1	Shisam	<i>Dalbergia sissoo</i>
2	Charoli	<i>Buchanania lanzan</i>
3	Palas	<i>Butea monosperma</i>
4	Hivar	<i>Vachellia leucophloea</i>
5	Kadulimb	<i>Azadirachta indica</i>
6	Ashoka	<i>Saraca asoca</i>
7	Pimple	<i>Ficus religiosa</i>
8	Behada	<i>Terminalia bellirica</i>
9	Jambhul	<i>Syzygium cumini</i>
10	Subabhul	<i>Leucaena leucocephala</i>
11	Maharukh	<i>Ailanthus excels</i>
12	Gulmohar	<i>Delonix regia</i>
13	Chinch	<i>Tomarindus indica</i>
14	Botal brush	<i>Callistemon viminalis</i>
15	Kanchan	<i>Bauhinia variegata</i>
16	Nilgiri	<i>Eucalyptus globulus</i>
17	Vad	<i>Ficus benghalensis</i>
18	Bamboo	<i>Bambusa vulgaris</i>
19	Karanj	<i>Milletia pinnata</i>
20	Botal pam	<i>Hyophorbela genicaulis</i>
21	Saru	<i>Casuarina equisetifolia</i>
22	Badam	<i>Terminalia catappa</i>
23	Sag	<i>Tectona grandis</i>
24	Ambha	<i>Mangifera indica</i>
25	Saptarni	<i>Alstonia scholaris</i>



**Photograph of Garden Develop by College**



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