

**Report
On
Green Audit
At
Nashik Gramin Shikshan Prasarak Mandals
Brahma Valley Institute of Management, Anjneri, Nashik
(Year 2019-20)**



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Acknowledgement

We at Nutan Urja Solutions, Pune, express our sincere gratitude to the management of Nashik Gramin Shikshan Prasarak Mandals Brahma Valley Institute of Management, Anjneri, Nashik 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

Nashik Gramin Shikshan Prasarak Mandals Brahma Valley Institute of Management, Anjneri, Nashik is conducted by Nutan Urja Solutions, Pune. Based On the audit field study, following important points can be presented.

1. Present Energy Consumption

Green Audit of Nashik Gramin Shikshan Prasarak Mandals Brahma Valley Institute of Management, Anjneri, Nashik 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	49,852	39.88
2	Minimum	27,597	22.08
3	Average	32,610	26.09
4	Total	3,91,315	313.05

2. Various Measures Adopted for Energy Conservation

1. Usage of LED lights at some indoor locations
2. Usage of LED Lights for outdoor lighting.

3. Usage of Renewable Energy

The collage has installed Solar Thermal Hot Water System.

4. Rain Water Harvesting

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

5. 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 there is hardly any generation of e-Waste in the premises.

6. Notes and Assumptions

1. Daily working hours-10 Nos
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

Brahma Valley Educational Campus is located in the outskirts of Anjaneri, (Trimbakeshwar High-Way Nashik) comprising a sprawling campus of about 35 acres land. The campus is situated in the valley surrounded by hills & reflects the beauty of nature. This place is also known as the birth place of Lord Hanuman and is close to Trimbakeshwar Temple which is one of the 12 Jyotirlingas of Lord Shiva which adds to the holiness and beauty of this area.

Brahma Valley Institute of Management has achieved strong growth and reputation in a very short time. The college has students joining from all over the state and beyond .The students are all very enthusiastic. College has a dynamic faculty to cater to their needs. Braham Valley Institute of Management is preparing competent professional managers. The academic quality of the institute is the vital factor and creative learning is provided by experienced faculty.

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. Nashik Gramin Shikshan Prasarak Mandals Brahma Valley Institute of Management, Anjneri, Nashik is situated in Brahma Valley Educational Campus. Entire Campus is having single energy meter for all institutes situated in campus. The bill analysis is carried for electricity bills of entire campus.

Table no 2.1: Summary of electricity bills

No	Month	Energy (kWh)	Bill Amount (Rs)
1	Jun-20	28157	279561
2	May-20	28157	279561
3	Apr-20	28157	279561
4	Mar-20	28157	279561
5	Feb-20	49852	911540
6	Jan-20	35218	355581
7	Dec-19	35219	351833
8	Nov-19	27597	288350
9	Oct-19	28157	279561
10	Sep-19	38421	359368
11	Aug-19	33479	308201
12	Jul-19	30744	292084
	Total	3,91,315	42,64,762

Variation in energy consumption is as follows,

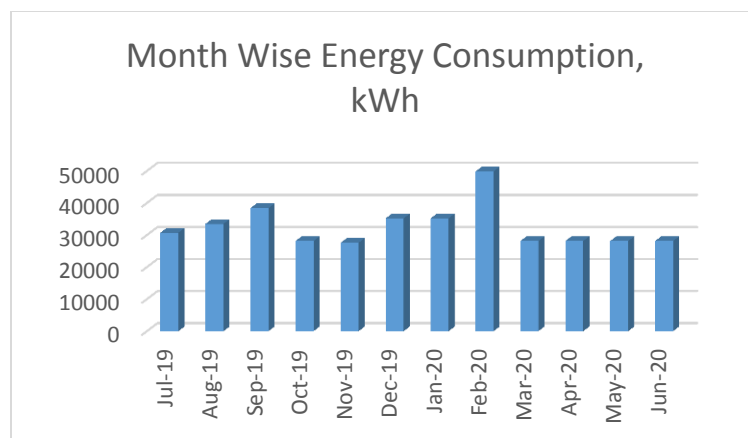


Figure 2.1: Month wise energy consumption

Monthly variation in electricity bill is as follows,

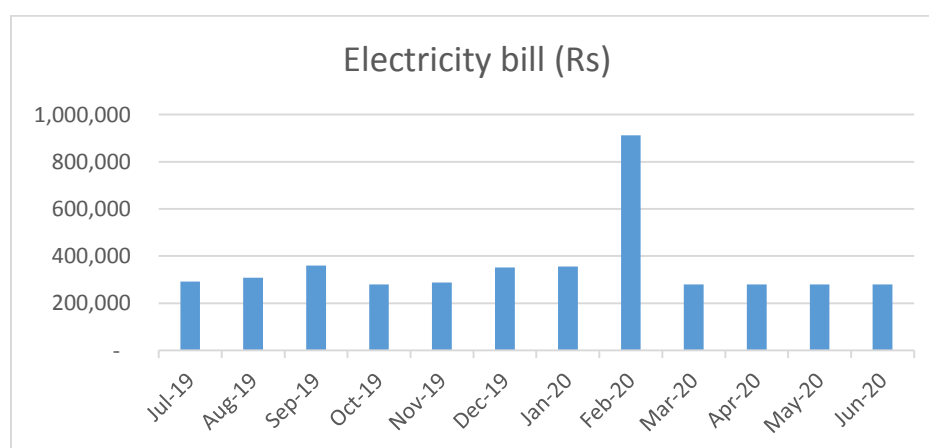


Figure 2.2: Month wise electricity bill

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	49,852	39.88
2	Minimum	27,597	22.08
3	Average	32,610	26.09
4	Total	3,91,315	313.05

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

Nashik Gramin Shikshan Prasarak Mandals Brahma Valley Institute of Management, Anjneri, Nashik is situated in Brahma Valley Educational Campus. Entire Campus is having single energy meter for all institutes situated in campus. CO₂ emissions due to Electrical Energy is calculated for entire campus.

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	CO2 Emissions, MT
1	Jun-20	28157	22.53
2	May-20	28157	22.53
3	Apr-20	28157	22.53
4	Mar-20	28157	22.53
5	Feb-20	49852	39.88
6	Jan-20	35218	28.17
7	Dec-19	35219	28.18
8	Nov-19	27597	22.08
9	Oct-19	28157	22.53
10	Sep-19	38421	30.74
11	Aug-19	33479	26.78
12	Jul-19	30744	24.60
	Total	3,91,315	313.05

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

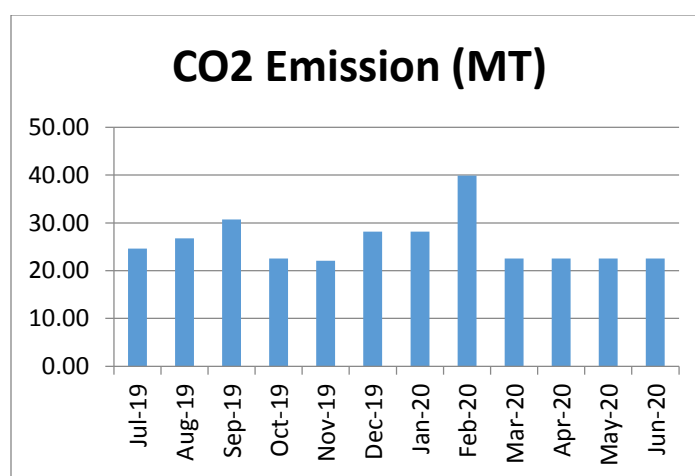


Figure 3.1: Month wise CO2 Emission

4. Study of usage of alternate energy

In this Chapter, we study the Usage of Alternate/Renewable Energy to Annual Energy Requirement of the College. The Brahma valley campus has installed Roof Top solar thermal hot water system of 2000 liters capacity. The college have also installed 5 nos of solar PV street lights.

Photograph of Solar Thermal Hot Water System



5. 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 Water Storage. This stored water is then reused for domestic purpose.

Photograph of Rain Water Harvesting



6. Study of Waste Management

6.1 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.

For canteen waste, college has installed biogas plant. Kitchen and other wastes (leftover cooked food (veg and non-veg), vegetable wastes are fed to biogas plant. The biogas generated is then used for cooking. Total capacity of biogas plant is 500 liters by volume. The college has more potential to for such biogas plant. The college is recommended to install more such plants with higher capacity.

Photograph of Biogas Plant



6.2 e-Waste Management

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

7. Study of Green Practices

7.1 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.

7.2 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. Institute encourages students to not to use automobiles.

7.3 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



7.4 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

7.5 Paperless Office

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

7.6 Green Landscaping with Trees and Plants

The Institute has beautiful maintained Garden.



Figure 7.1: Beautiful maintained Garden of college