GREEN AUDIT REPORT
OF
VIVEKANAND MAHAVIDYALAYA
BHADRAVATI-442902

Year: 2017-18

Prepared by:

Enrich Consultants

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

MAHARASHTRA ENERGY DEVELOPMENT AGENCY

Maharashtra Energy Development Agency
(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006.
Ph No: 020-26614393/26614403
Email: eec@mahaurja.com, Web: www.mahaurja.com

ECN/2018-19/CR-05/4174 — 19th September , 2018

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	:	**Enrich Consultants** Yashashree, Plot No. 26, Nirmal Bag Society, Near Muktangan English School, Parvati, Pune - 411009.
Registration Category	:	Empanelled *Consultant for Energy Conservation Programme*
Registration Number	:	***MEDA/ECN/CR-05/2018-19/EA-03***

- 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 the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **31st March 2021** 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.

19/9/18
(Smita Kudarikar)
General Manager (EC)

ENRICH CONSULTANTS * Pune *

Enrich Consultants

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

Ref: EC/VM/17-18/26 Date: 22/08/2018

CERTIFICATE

This is to certify that we have conducted Green Audit at Vivekanand Mahavidyalaya,Bhadravati in the Academic year 2017-18.

The College has adopted following Green Initiatives:

- Maximum Usage of Day Lighting
- Provision of Separate bins for Dry & Wet Waste
- The College has installed Septic Tank and is cleaned periodically.
- Implementation of Rain Water Management Project
- Maintenance of good Internal Road
- Tree Plantation in the campus
- Creation of awareness by Display of Posters on Resource Conservation

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

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

ENRICH CONSULTANTS * Pune *

INDEX

ACKNOWLEDGEMENT

We Enrich Consultants, Pune, express our sincere gratitude to the management of, Vivekanand Mahavidyalaya,Bhadravati, for awarding us the assignment of Green Audit of their Campus for the Academic Year: 2017-18.

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

EXECUTIVE SUMMARY

1. **Vivekanand Mahavidyalaya, Bhadravati** consumes Energy in the form of **Electrical Energy** used for various Electrical Equipment, office & other facilities.

2. **Present Energy Consumption & CO_2 Emissions:**

No	Parameter/ Value	Energy Purchased, kWh	CO_2 Emissions, MT
1	Total	12708	11.437
2	Maximum	1520	1.368
3	Minimum	667	0.600
4	Average	1059	0.953

3. **Various initiatives taken for Energy Conservation:**

- Maximum Usage of Day Lighting

4. **Usage of Renewable Energy& CO_2 Emission Reduction:**

- It is recommended to install roof-top solar PV Plant on college building.

5. **Waste Management:**

5.1 Segregation of Waste at Source:

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

5.2 Organic Waste Management:

The College has installed bio-composting pit, to convert bio-degradable waste into bio-fertilizer.

5.3 Liquid Waste Management:

The College has installed Septic and is cleaned periodically.

5.4 E-Waste Management:

It is recommended to dispose E-Waste through Authorized collecting agency.

5.5 Sanitary Waste Incinerator:

It is recommended to install Sanitary Waste Incinerator for sanitary waste disposal.

6. **Rain Water Management:**

The College has installed the Rainwater management project, the rain water falling on the terrace is collected and is used for increasing the under the underground water level.

7. Green & Sustainable Initiatives

- Maintenance of good Internal Road
- Maintenance of Internal Garden
- Display of Posters on Resource Conservation
- Best Practices and Initiative for Social Awareness

8. Notes &Assumptions:

1. 1 kWh of Electrical Energy releases **0.9 Kg** of CO_2into atmosphere

9. References:

- For CO_2 Emissions: www.tatapower.com

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 CO_2 emissions
3. To study usage of Renewable Energy
4. Study of Waste Management
5. Study of Rain Water Management
6. Study of Green & Sustainable Practices

1.2 General Details of College: Table No 1:

No	Head	Particulars
1	Name of Institution	Vivekanand Mahavidyalaya
2	Address	Vijasan Road, Bhadravati
3	Affiliation	Gondwana University,Gadchiroli

CHAPTER-II
STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Bills

Table No 2: Electrical Bill Analysis- 2017-18:

No	Month	Energy Purchased, kWh
1	Apr-17	1520
2	May-17	969
3	Jun-17	1437
4	Jul-17	667
5	Aug-17	1310
6	Sep-17	1424
7	Oct-17	920
8	Nov-17	1077
9	Dec-17	1037
10	Jan-18	722
11	Feb-18	747
12	Mar-18	878
13	Total	12708
14	Maximum	1520
15	Minimum	667
16	Average	1059

Chart No 1: Variation in Monthly Energy Consumption:

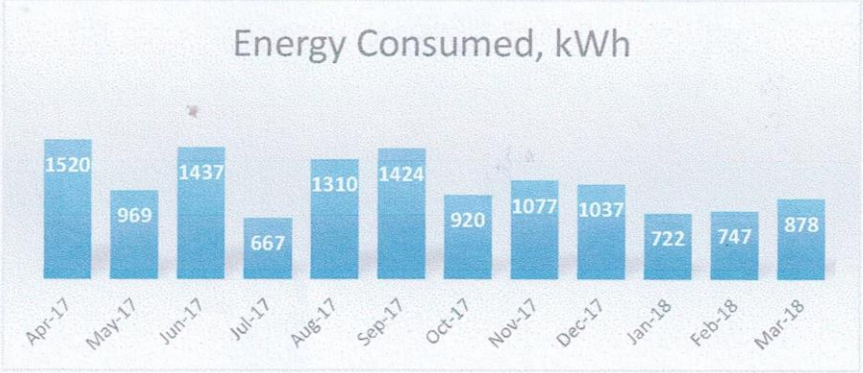


Table No 3: Variation in Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh
1	Total	12708
2	Maximum	1520
3	Minimum	667
4	Average	1059

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 for various Electrical gadgets.

Basis for computation of CO_2 Emissions:

The basis of Calculation for CO_2 emissions is as under.

- **1 kWh** of Electrical Energy releases **0.9 Kg of CO_2** into atmosphere

Based on the above Data we compute the CO_2 emissions which are being released in to the atmosphere by the College due to its Day to Day operations

Table No4: Month wise CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO2 Emissions, MT
1	Apr-17	1520	1.368
2	May-17	969	0.8721
3	Jun-17	1437	1.2933
4	Jul-17	667	0.6003
5	Aug-17	1310	1.179
6	Sep-17	1424	1.2816
7	Oct-17	920	0.828
8	Nov-17	1077	0.9693
9	Dec-17	1037	0.9333
10	Jan-18	722	0.6498
11	Feb-18	747	0.6723
12	Mar-18	878	0.7902
13	Total	12708	11.4372
14	Maximum	1520	1.368
15	Minimum	667	0.6003
16	Average	1059	0.9531

Chart No 2: Month wise CO_2 Emissions:

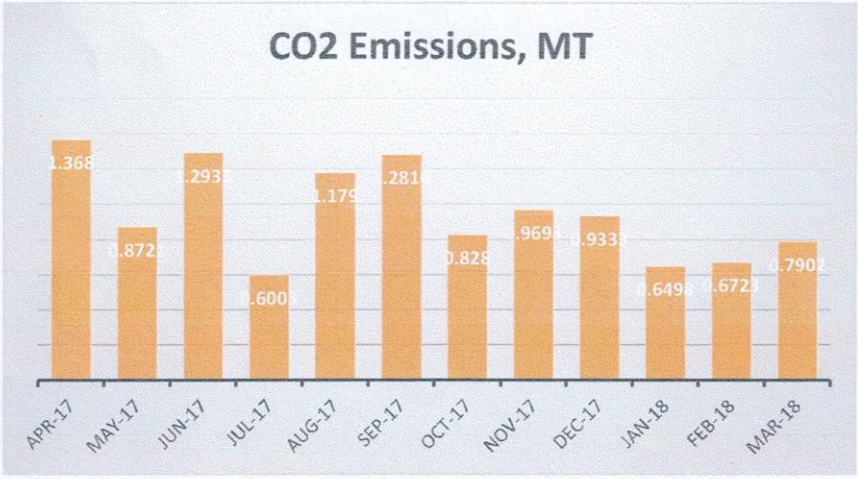


Table No 5: Variation in Important Parameters:

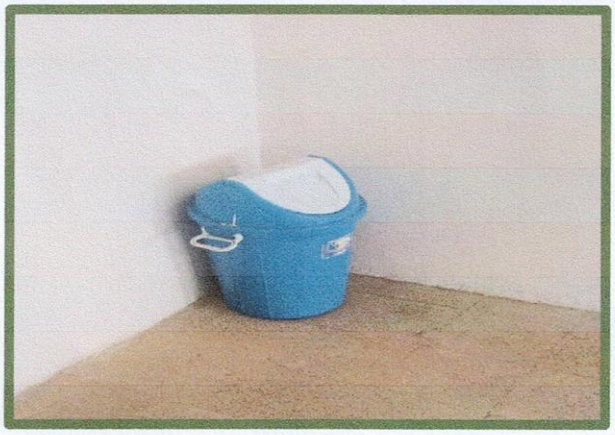
No	Parameter/ Variation	Energy Purchased, kWh	CO2 Emissions, MT
1	Total	12708	11.4372
2	Maximum	1520	1.368
3	Minimum	667	0.6003
4	Average	1059	0.9531

CHAPTER IV
STUDY OF USAGE OF RENEWABLE ENERGY

As on today College has not installed solar roof-top PV plant, solar thermal water heating plant, it is recommend to install solar rooftop plant on the College building.

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 waste collecting agent for further recycling.



5.2 Organic Waste Management:
The College has installed bio-composting pit, to convert bio-degradable waste into bio-fertilizer.

5.3 Liquid Waste Management:
The College has installed Septic tank and is cleaned periodically.

5.4 E-Waste Management:

It is recommended to disposed E-Waste through Authorized Agency.

5.4 Sanitary Waste Incinerator:

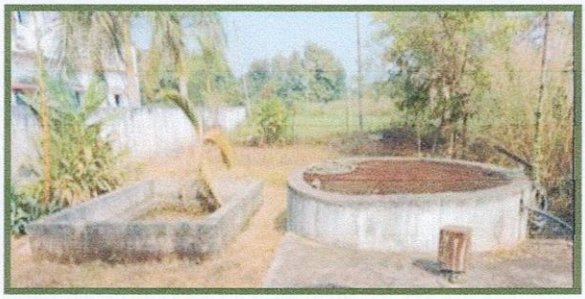
The College has not install Sanitary Waste Incinerator for sanitary waste disposal. It is recommended to install Sanitary Waste Incinerator.

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 used to increase the underground water table.

Photograph of Rain Water Management 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 landscaped garden in the campus.

Photograph of Tree plantation:

7.3 Provision of Ramp:

The College has facility for ramp, for easy movement for Divyaang.

ANNEXURE-1:
DETAILS OF TREES & PLANTS:

Sr.No.	Name of Plants/Trees
1	Acacia Concinna
2	Andrographis paniculata
3	Asparagus racemosus
4	Calotropis gigantean
5	Clerodendrum viscosum Vent
6	Cymbopogon citrates
7	Datura inoxias Mill
8	Hibiscus rosa-sinensis L
9	Mimosa Pudica
10	Ocimum sanctum
11	Rosa indica
12	Thuja sp.
13	Aloe barbadensis
14	Justicia adhatoda
15	Tinospora cordifolia
16	Kalanchoe pinnata
17	Tridax procumbens
18	Catharanthus
19	Mints
20	Almond
21	Carissa carandas
22	Gardenia gummifera Linn.
23	Azadirachta Indica
24	Alstonia scholaris
25	Manilkara zapota
26	Psidium guajava
27	Tectona grandis
28	Delonix regia
29	Indian rosewood
30	Phyllanthus emblica