# GREEN AUDIT REPORT
# OF
# VIVEKANAND MAHAVIDYALAYA
# BHADRAVATI- 442 902

**Year: 2020-21**


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
An ISO 9001 : 2000 Reg. no. : RQ 91 / 2462

**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/2021-22/CR-14/1577 — 22nd April, 2021

## 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 Enrich Consultants**<br>Yashashree, Plot No. 26, Nirmal Bag Society,<br>Near Muktangan English School, Parvati,<br>Pune - 411009. |
| **Registration Category** | : | *Empanelled Consultant for Energy Conservation Programme for Class 'A'* |
| **Registration Number** | : | *MEDA/ECN/2021-22/Class A/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 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 **21st April, 2023** 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 (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/19-20/11 Date: 16/08/2020

## CERTIFICATE

This is to certify that we have conducted Green Audit at Vivekanand Mahavidyalaya, Bhadravati in the Academic year 2020-21.

The College has adopted following Green Initiatives:

- Usage of Energy Efficient LED Light Fitting
- 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 at Vivekanand Mahavidyalaya, Bhadravati, for awarding us the assignment of Green Audit of their Campus for the Academic Year: 2020-21.

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 | 12368 | 11.131 |
| 2 | Maximum | 3103 | 2.792 |
| 3 | Minimum | 647 | 0.582 |
| 4 | Average | 1030.666 | 0.927 |

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

- Usage of Energy Efficient LED Lighting
- 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:**

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

**5.5 Sanitary Waste Incinerator:**

The College has installed 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 $CO_2$into 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- 2020-21:**

| No | Month | Energy Purchased, kWh |
|---|---|---|
| 1 | Apr-20 | 949 |
| 2 | May-20 | 949 |
| 3 | Jun-20 | 949 |
| 4 | Jul-20 | 3103 |
| 5 | Aug-20 | 858 |
| 6 | Sep-20 | 870 |
| 7 | Oct-20 | 902 |
| 8 | Nov-20 | 803 |
| 9 | Dec-20 | 647 |
| 10 | Jan-21 | 756 |
| 11 | Feb-21 | 768 |
| 12 | Mar-21 | 814 |
| 13 | Total | 12368 |
| 14 | Maximum | 3103 |
| 15 | Minimum | 647 |
| 16 | Average | 1030.66 |

**Chart No 1: Variation in Monthly Energy Consumption:**

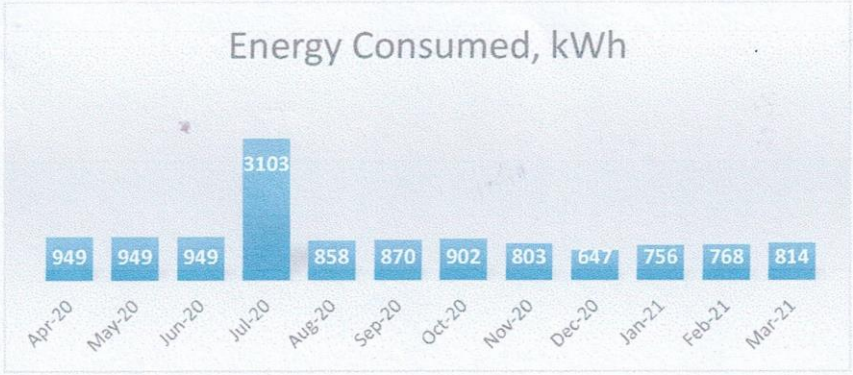


**Table No 3: Variation in Important Parameters:**

| No | Parameter/ Variation | Energy Purchased, kWh |
|---|---|---|
| 1 | Total | 12368 |
| 2 | Maximum | 3103 |
| 3 | Minimum | 647 |
| 4 | Average | 1030.66 |

# 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 Purchased, kWh | $CO_2$ Emissions, MT |
|---|---|---|---|
| 1 | Apr-20 | 949 | 0.8541 |
| 2 | May-20 | 949 | 0.8541 |
| 3 | Jun-20 | 949 | 0.8541 |
| 4 | Jul-20 | 3103 | 2.7927 |
| 5 | Aug-20 | 858 | 0.7722 |
| 6 | Sep-20 | 870 | 0.783 |
| 7 | Oct-20 | 902 | 0.8118 |
| 8 | Nov-20 | 803 | 0.7227 |
| 9 | Dec-20 | 647 | 0.5823 |
| 10 | Jan-21 | 756 | 0.6804 |
| 11 | Feb-21 | 768 | 0.6912 |
| 12 | Mar-21 | 814 | 0.7326 |
| 13 | Total | 12368 | 11.1312 |
| 14 | Maximum | 3103 | 2.7927 |
| 15 | Minimum | 647 | 0.5823 |
| 16 | Average | 1030.666 | 0.9276 |

**Chart No 2: Month wise $CO_2$Emissions:**

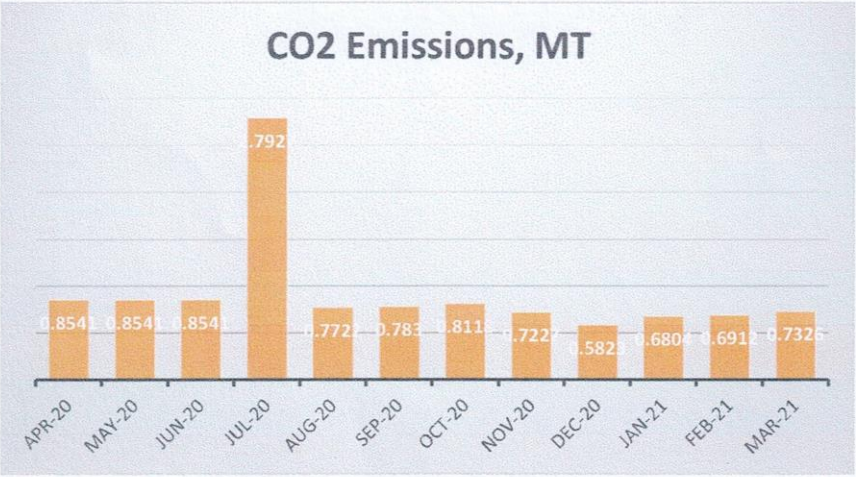


**Table No 5: Variation in Important Parameters:**

| No | Parameter/ Variation | Energy Purchased, kWh | CO2 Emissions, MT |
|---|---|---|---|
| 1 | Total | 12368 | 11.131 |
| 2 | Maximum | 3103 | 2.792 |
| 3 | Minimum | 647 | 0.582 |
| 4 | Average | 1030.66 | 0.927 |

# CHAPTER IV
# STUDY OF USAGE OF RENEWABLE ENERGY

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

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# CHAPTER V
# STUDY OF WASTE MANAGEMENT

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

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The College has installed Septic tank and is cleaned periodically.

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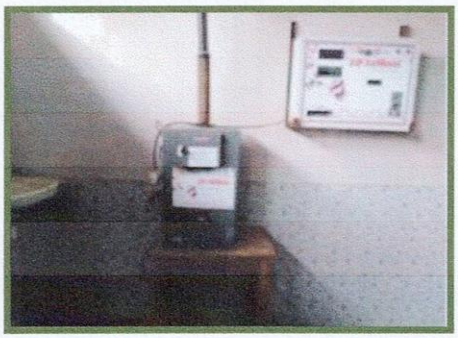
The E-Waste is disposed of through Authorized Agency.

**5.5 Sanitary Waste Incinerator:**

The College has Sanitary Waste Incinerator for sanitary waste disposal.



# 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:**

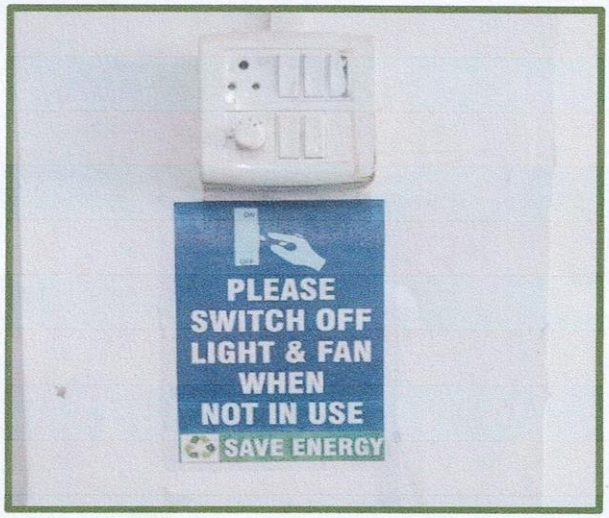
### 7.3 Provision of Ramp:

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

### 7.4 Creation of Awareness about Energy Conservation:

The College has displayed posters emphasizing on importance of Energy Conservation.

**Photograph of Poster on Energy Conservation:**



## 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 |