

**ENERGY AUDIT REPORT**  
**OF**  
**SEVADAL MAHILA MAHAVIDYALAYA**  
**SAKKARDARA SQUARE UMRER ROAD,**  
**NAGPUR- 440 024**



Year: 2018-19



Prepared by:

**Enrich Consultants**

Yashashree, 26, Nirmal Bag Society, Near Mukhtangan English School, Parvati, Pune 411009  
Phone: 09890444795 Email: [enrichcons@gmail.com](mailto:enrichcons@gmail.com)

  
**Principal**

**Sevalal Mahila Mahavidyalaya**  
**Umrer Road, Nagpur-9.**

**MAHARASHTRA ENERGY DEVELOPMENT AGENCY**



**Maharashtra Energy Development Agency**

(A Government of Maharashtra undertaking)

2<sup>nd</sup> Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006,

Ph No: 020-26614393/266144403

Email: [eee@mahaurja.com](mailto:eee@mahaurja.com), Web: [www.mahaurja.com](http://www.mahaurja.com)

ECN/2018-19/CR-05/4174

19<sup>th</sup> 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 **31<sup>st</sup> 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.

  
(Smita Kudarikar)  
General Manager (EC)

  
**Principal**  
Sevadal Mahila Mahavidyalaya  
Umrer Road, Nagpur-9.



# Enrich Consultants

Yashashree, 26, Nirmal Bag Society,  
Near Mukhtangan English School, Parvati, Pune 411 009  
Tel: 09890444795 Email: [enrichcons@gmail.com](mailto:enrichcons@gmail.com)

Ref: EC/SMM/18-19/04

Date: 14/05/2019

## CERTIFICATE


This is to certify that we have conducted Energy Audit at Sevadal Mahila Mahavidyalaya, Nagpur – 440 024 in the Academic year 2018-19.

The College has adopted following Energy Efficient practices:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting

We appreciate the support of Management, involvement of faculty members and students in the process of making the Campus Energy Efficient.

For Enrich Consultants,



**A Y Mehendale,**  
Certified Energy Auditor  
EA-8192



**Principal**  
Sevadal Mahila Mahavidyalaya  
Umrer Road, Nagpur-9.

## INDEX

Sr. No	Particulars	Page No
I	Acknowledgement	5
II	Executive Summary	6
III	Abbreviations	7
1	Introduction	8
2	Study of Connected Load	9
3	Study of Present Energy Consumption	11
4	Carbon Foot Printing	13
5	Study of Usage of Alternate Energy	14
6	Study of LED Lighting	15



**Principal**  
Sevadal Mahila Mahavidyalaya  
Umrer Road, Nagpur-9.

## **ACKNOWLEDGEMENT**

We Enrich Consultants, Pune, express our sincere gratitude to the management of Sevadal Mahila Mahavidyalaya, Nagpur for awarding us the assignment of Energy Audit of their Campus for the Academic Year: 18-19.

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

  
Principal

Sevadal Mahila Mahavidyalaya  
Umrer Road, Nagpur-9.

## EXECUTIVE SUMMARY

1. Sevadal Mahila Mahavidyalaya, Nagpur consumes Energy in the form of Electrical Energy used for various Electrical Equipment, office & other facilities.

2. Present Energy Consumption & CO<sub>2</sub> Emission:

No	Parameter/ Value	Energy Purchased, kWh	CO <sub>2</sub> Emissions, MT
1	Total	13728	12.355
2	Maximum	1682	1.513
3	Minimum	646	0.584
4	Average	1144	1.029

3. Energy Conservation projects already installed:

- Usage of Energy Efficient LED fittings
- Maximum Usage of Day Lighting

4. Usage of Alternate Energy:

- As on today College has not installed solar rooftop power plant, solar thermal water heating plant. It is recommended to install solar power rooftop system and solar thermal water heating plant on the college building as per availability of funds.

5. Usage of LED Lighting:

- The Total Annual Lighting Demand of the College is **2263.68 kWh**.
- The Total Annual LED Lighting Demand is **362.88 kWh**.
- The percentage of Annual LED Lighting to Annual Lighting Demand is **16.03 %**.

6. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.9 Kg** of CO<sub>2</sub> into atmosphere
2. **100 LPD** Solar Thermal System saves **1500 kWh** of Electrical Energy per Annum.
3. Daily working hours-**4 Nos** (For Lighting Calculations)
4. Annual working Days-**120 Nos** (For Lighting Calculations)

7. References:

- For CO<sub>2</sub> Emissions: [www.tatapower.com](http://www.tatapower.com)

  
Principal

Sevadal Mahila Mahavidyalaya  
Umrer Road, Nagpur-9.

## ABBREVIATIONS

LED	: Light Emitting Diode
MSEDCL	: Maharashtra State Electricity Distribution Company Limited
IQAC	: Internal Quality Assurance Cell
BEE	: Bureau of Energy Efficiency
FTL	: Fluorescent Tube Light
Kg	: Kilo Gram
kWh	: kilo-Watt Hour
CO <sub>2</sub>	: Carbon Di Oxide
MT	: Metric Ton



**Principal**  
Sevadal Mahila Mahavidyalaya  
Umrer Road, Nagpur-9.

## **CHAPTER-I INTRODUCTION**

### **1.1 Objectives:**

1. To study present Energy Consumption
2. To Study the present CO<sub>2</sub> emissions
3. To study usage of Alternate Energy
4. To study usage of LED Lighting

### **1.2 Table No 1: General Details of the College:**

No	Head	Particulars
1	Name of Institution	Sevadal Mahila Mahavidyalaya
2	Address	Sakkardara Square Umrer Road, Nagpur 440 024
3	Affiliation	Rashtra Sant Tukodoji Maharaj, Nagpur, University



**Principal**  
Sevadal Mahila Mahavidyalaya  
Umrer Road, Nagpur-9.



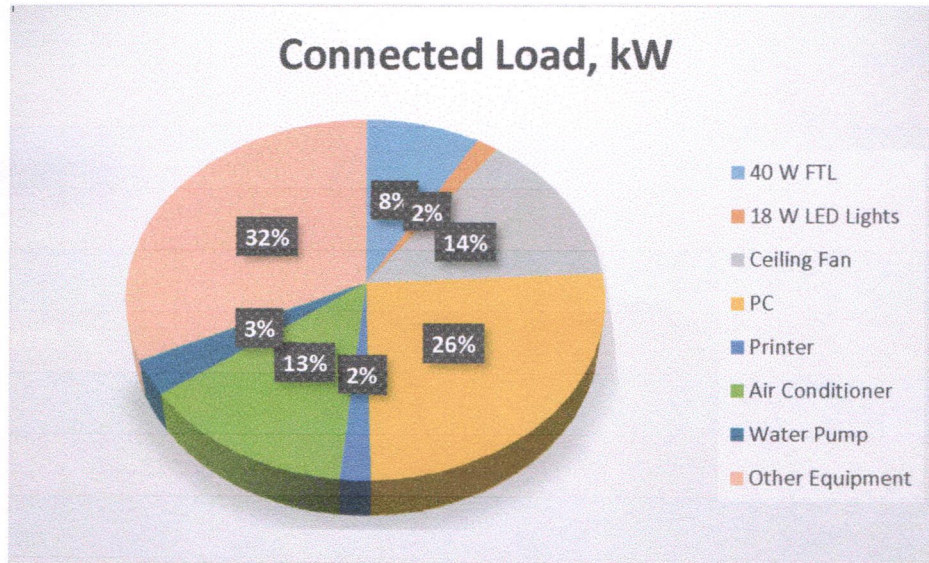
## CHAPTER-II STUDY OF CONNECTED LOAD

The major contributors to the connected load of the College include:

**Table No 2: Study of Equipment wise Connected Load:**

No	Equipment	Qty	Load, W/Unit	Load, kW
1	40 W FTL	99	40	3.96
2	18 W LED Lights	42	18	0.756
3	Ceiling Fan	102	65	6.63
4	PC	80	150	12
5	Printer	6	150	0.9
6	Air Conditioner	3	2100	6.3
7	Water Pump	1	1492	1.492
8	Other Equipment	100	150	15
9	<b>Total</b>			<b>47</b>

**Chart No 1: Study of Connected Load:**



  
**Principal**  
 Sevadal Mahila Mahavidyalaya  
 Umrer Road, Nagpur-9.

### CHAPTER-III STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Electrical Energy Consumption.

Table No 3: Electrical Bill Analysis- 2018-19:

No	Month	Energy Purchased, kWh
1	Apr-18	1544
2	May-18	1318
3	Jun-18	646
4	Jul-18	963
5	Aug-18	1682
6	Sep-18	1378
7	Oct-18	1565
8	Nov-18	914
9	Dec-18	660
10	Jan-19	774
11	Feb-19	902
12	Mar-19	1382
13	Total	13728
14	Maximum	1682
15	Minimum	646
16	Average	1144

Chart No 2: Variation in Monthly Energy Consumption:

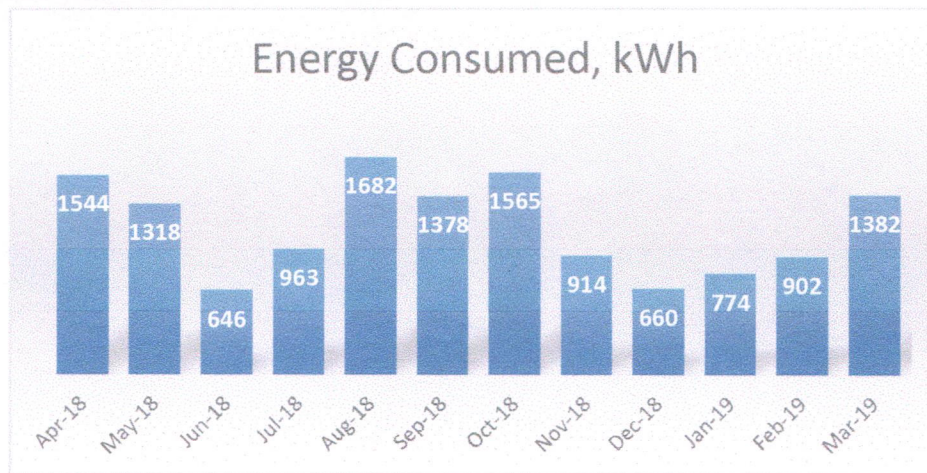


Table No4: Variation in Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh
1	Total	13728
2	Maximum	1682
3	Minimum	646
4	Average	1144

Principal  
Sevadal Mahila Mahavidyalaya  
Umrer Road, Nagpur-9



## CHAPTER-IV 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 taking into account the usage of the Electrical Energy.

### Basis for computation of CO<sub>2</sub> Emissions:

- 1 kWh of Electrical Energy releases 0.9 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

Table No5: Month wise CO<sub>2</sub> Emissions:

No	Month	Energy Purchased, kWh	CO <sub>2</sub> Emissions, MT
1	Apr-18	1544	1.3896
2	May-18	1318	1.1862
3	Jun-18	646	0.5814
4	Jul-18	963	0.8667
5	Aug-18	1682	1.5138
6	Sep-18	1378	1.2402
7	Oct-18	1565	1.4085
8	Nov-18	914	0.8226
9	Dec-18	660	0.594
10	Jan-19	774	0.6966
11	Feb-19	902	0.8118
12	Mar-19	1382	1.2438
13	Total	13728	12.3552
14	Maximum	1682	1.5138
15	Minimum	646	0.5814
16	Average	1144	1.0296



**Principal**  
Sevadal Mahila Mahavidyalaya  
Umrer Road, Nagpur-9.

Chart No 3: Month wise CO<sub>2</sub>Emissions:

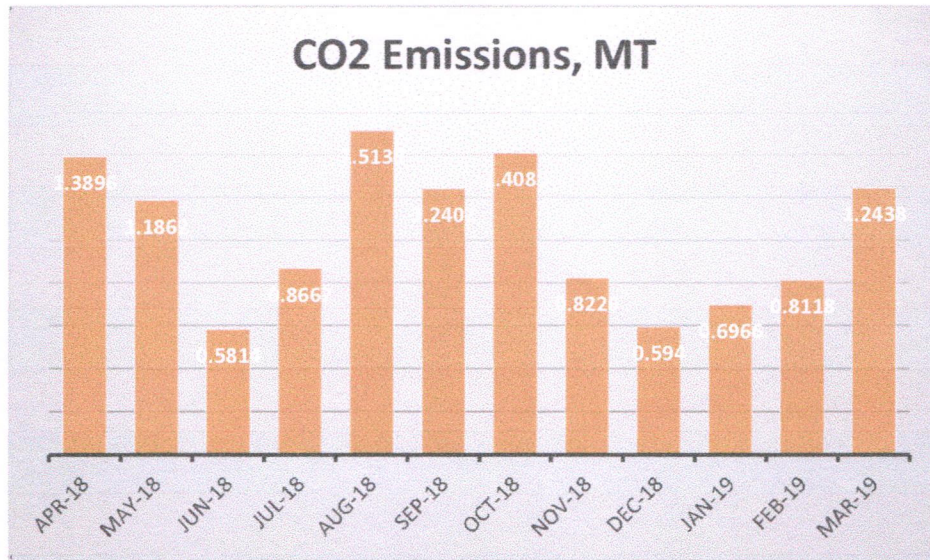


Table No 6: Important Parameters:

No	Parameter/ Variation	Energy Purchased, kWh	CO2 Emissions, MT
1	Total	13728	12.3552
2	Maximum	1682	1.5138
3	Minimum	646	0.5814
4	Average	1144	1.0296

  
Principal

Sevadal Mahila Mahavidyalaya  
Umrer Road, Nagpur-9.

## **CHAPTER V STUDY OF USAGE OF ALTERNATE ENERGY**

As on today College has not install solar roof-top PV plant, solar thermal water heating plant; the percentages of uses of alternate energy to the annual energy demand work to be zero percent.



**Principal**  
Sevadal Mahila Mahavidyalaya  
Umrer Road, Nagpur-9.

## CHAPTER VI STUDY OF USAGE OF LED LIGHTING

In this chapter, we compute the percentage of usage of LED Lighting to Annual Lighting power requirement.

**Table No 8: Percentage of Usage of LED Lighting to Annual Lighting Load:**

No	Particulars	Value	Unit
1	No of 18 W LED Light Fittings	42	Nos
2	Demand of 18 W LED Light Fitting	18	W/Unit
3	Total Electrical Load of 18 W LED Light Fittings	<b>0.756</b>	kW
4	No of 40 W FTL Tube Lights	99	Nos
5	Demand of 40 W FTL Tube Light	40	W/Unit
6	Total Electrical Load of 40 W FTL Fittings	<b>3.96</b>	kW
7	Total Lighting Load=3+6	<b>4.716</b>	kW
8	Total LED Lighting Load= 6	<b>0.756</b>	kW
9	Average Daily Usage Period	4	Hours
10	Annual Working Days	120	Nos
11	Annual Total Lighting Load = 7*9*10	<b>2263.68</b>	kWh
12	Annual LED Lighting Load = 8*9*10	<b>362.88</b>	kWh
13	Annual Lighting Requirement met by LED= 12*100/11	<b>16.03</b>	%



**Principal**  
Sevadal Mahila Mahavidyalaya  
Umrer Road, Nagpur-9.

