

Shetakari Shikashan Prasarak Mandal, Rethar Bk.

**Krishna Mahavidyalaya, Rethare Bk.**



**Criterion VII**

**Institutional Values and Best Practices**

**7.1 Institutional Values and Social  
Responsibilities**

**7.1.2**

**The institution has facilities and initiatives  
for**

**Energy Audit & Certificate  
(2017-18 to 2021-22)**

Energy Audit Report  
Of  
Shetkari Shikshak Prasarak Mandal's,  
**Krishna Mahavidyalaya, Rethare Bk.**  
Energy Audit of the Year: 2017-18 to 2021-22



By

**Prof. Er. Dr. EA. Dhananjay Bhagawandas Devi,**

M.Tech. (Energy Tech.) ,B.E. ( Electrical), E. Á., D.C.S., D. N., M.I.E.

Associate Professor of Electronics & Telecommunication Engineering Department,  
Karmaveer Bhaurao Patil College of Engineering, Camp- Satara-415001.

Certified Energy Auditor (BEE) (EA-6470)

Doctor of Naturopathy & Magneto Therapy

Member: Indian Society of Heating, Refrigerating & Air Conditioning Engineers, New Delhi

Life Member: Indian Society for Technical Education, New Delhi

Presently at

**Rayat Shikshan Sanstha's**

**Karmaveer Bhaurao Patil Polytechnic, Varye – Satara-415015**

## Contents

<b>Sr. No.</b>		<b>Page No.</b>
<b>1</b>	<b>Acknowledgement</b>	<b>3</b>
<b>2</b>	<b>Executive Summery</b>	<b>4</b>
<b>3</b>	<b>Introduction</b>	<b>5</b>
<b>4</b>	<b>Methodology &amp; Instrumentation</b>	<b>6</b>
<b>5</b>	<b>Observations</b>	<b>6</b>
<b>6</b>	<b>Conclusion / Recommendations</b>	<b>7</b>
<b>7</b>	<b>Annexure</b>	<b>8</b>
<b>8</b>	<b>Preliminary Energy Audit Certificate</b>	<b>9</b>

## Acknowledgement

The Energy and specifically electrical energy is the cleanest source of energy and getting utilized to the highest extent due to flexibility and effective utilization. Conservation of energy does not mean to limit the use of energy but to use it most effectively, efficiently and optimally.

The purpose of preliminary energy audit is to confirm whether the energy is used effectively, efficiently and optimally. Another focus is to identify the areas of Energy Conservation and to suggest measures to conserve the same.

The initiative of Shetkari Shikshak Prasarak Mandal's, Krishna Mahavidyalaya, Rethare Bk. towards Carrying out Energy Audit is deeply appreciated and is indicative of institute's keen attention towards conservation of energy.

The Energy Audit team of Karmaveer Bhaurao Patil Polytechnic, Varye, Satara, is thankful to the Principal Dr. C.B. Salunkhe, Dr. Dhananji Dalavi, Prof. Rohit Mane, Shri. Vinayak Jadhav, Campus Supervisor Hanamant Hivare & Bharat Wayadande of Shetkari Shikshak Prasarak Mandal's, Krishna Mahavidyalaya, Rethare Bk. , the faculty and staff members for the cooperation.



**Prof. Er. Dr. EA. Dhananjay Bhagawandas Devi,**

M.Tech.( Energy Tech.) ,B.E. ( Electrical), E. Á., D.C.S., D. N., M.I.E.

Certified Energy Auditor (BEE) (EA-6470)

Doctor of Naturopathy & Magneto Therapy

Member: Indian Society of Heating, Refrigerating & Air Conditioning Engineers, New Delhi

Life Member: Indian Society for Technical Education, New Delhi



Dr. K.C. Shaikh,

In charge Principal

Rayat Shikshan Sanstha's

Karmaveer Bhaurao Patil Polytechnic,

Varye - Satara-415015

## Executive Summery

The preliminary energy audit report is submitted of the various electrical installations of various locations, laboratories of **Shetkari Shikshak Prasarak Mandal's, Krishna Mahavidyalaya, Rethare Bk.** a premier College in Rethare area of Karad Taluka of Satara District.

The major and most of energy utilization is in the form of electrical energy and hence audit of electrical energy is primary consideration.

The objective of this audit is to assess primarily the electrical installations in the institute buildings, campus and suggest energy conservation majors. The electrical installations of this institute had not been assessed for its electrical power utilization since 2017.

During this preliminary energy audit; electrical equipments, laboratory equipments and lighting systems are reviewed on 23/03/2023.

### Summary of observations and recommendations

1. The energy audit conducted is a preliminary energy audit.
2. Electrical power utilization is mainly for lighting and utilities.
3. The monthly energy bill of institute can be reduced with revision tariff revision arrangement with MSEDCL.
4. The institute is educational institute and the laboratory equipment usage is dependent on usage by students. Hence computed energy usage 16722 kWh in 2017-18, which is higher than 6884 KWh & 8963 KWh of the year 2018-19 & 2019-20. Decrease in consumption is because of COVID-19 pandemic situation. The power consumption in post Covid situation 8058 KWh & 9660KWh in the year 2020-21 & 2021-22.
5. **Electrical Load on three phases should be properly balanced.**
6. **Earthing at all panels, equipments should be as per ISI & IES. It is recommended to check earth to neural voltage frequently & accordingly earth points be treated to improve earthing**
7. Detailed electrical schematic diagram should be prepared with load details, to enable further detailed audit.
8. Electrical power distribution panel room must be clean & should be easily accessible to cut of power in case of emergency.
9. UPS battery need to maintain appropriately and must be properly ventilated. Regular maintenance of batteries is must.
10. Stacking of wastage in control panel room should be avoided.
11. UPS batteries please be recycled properly. Regular maintenance of batteries is must to improve healthy condition of the computer & allied peripherals.
12. Institution name board be illuminated using 50W LED ( at least Two Nos.) flood lights

**Prof. Er. Dr. EA. Dhananjay Bhagawandas Devi,**

M.Tech.( Energy Tech.) ,B.E. ( Electrical), E. Á., D.C.S., D. N., M.I.E.

Certified Energy Auditor (BEE) (EA-6470)

Doctor of Naturopathy & Magneto Therapy

Member: Indian Society of Heating, Refrigerating & Air Conditioning Engineers, New Delhi

Life Member: Indian Society for Technical Education, New Delhi

## **1. Introduction**

### **Objective of Audit**

This college Krishna Mahavidyalaya, Rethare Bk was established by Hon. Jayawantrao Bhosale, President Shetkari Shikshan Prasarak Mandal, Rethare Bk on 6<sup>th</sup> June 1978. The institution started with only a Science faculty in 1978 but with the demand and needs of society & students, Art's faculty had been started in June 1995 and Commerce faculty in June 2005. These faculties provide a great opportunity for education to the rural students of the nearby areas.

This college is included under UGC section 2(f) and 12(B) and is located in a rural area on the boundary of the Satara and Sangli district. The college is catering to needs of the rural students with agricultural and worker backgrounds. All opportunities are provided for the students, who also inspire to become UG and PG, with the help of experienced faculty members having Ph.D., NET, and SET qualifications. In connection with this, Governing body in consultation with College Development Committee (CDC) started post-graduate courses and we have research facilities in Botany from 1988 such as M.Sc., M.Phil., Ph.D. and started M.A. (Hindi) in 2010-11.

With the motto of Quality Education for Personality and Nationality, the Management adopted quality education for achieving all-round development of students in the context of new challenges in higher education with the progress of rural areas by NSS, NCC activities, Gymnasium as well as by organizing seminars, workshops, and campus interviews.

Electrical energy is the major source of energy used for operations. It is now becoming necessity to review the locations of electrical installations and equipments from electrical power consumption and efficiency assessment point of view. With the intention to have primary assessment and to overview the situation this preliminary energy audit activity is carried out.

### **Description of facility, building Audited**

The institute is located within the Campus of over the area of 15 acres.

Total built up area occupied is 3000 sq. meter (built up area is 32300 sq. ft.) by various academic departments, library, administrative building etc.

### **Scope of Audit**

The scope of this Energy Audit is limited to preliminary energy audit with the intention to identify possible opportunities for revision and modifications to improve energy efficiency, pertaining to electrical power utilization. Major energy used is electrical energy for lighting, equipments, computers, etc.

## 2. Methodology and Instrumentation

Electrical energy data for last Five years is submitted by the institute and is verified locally.

Ratings of lighting system, equipments and installations are verified and confirmed with Volt Amp meters, Digital Power Analyzer wherever necessary.

Available data is further analyzed to find out the discrepancies and opportunities to improve performance and effective utilization of electrical energy.

## 3. Observations

- The institute is visited by Prof. Dr. Dhananjay Devi & Prof. Dr. Dilip Aldar on 23/03/2023.
- Representative of institute **Dr. Dhananji Dalavi, Prof. Rohit Mane, Shri. Vinayak Jadhav, Campus Supervisor Hanamant Hivare & Bharat Wayadande** and concerned staff were present during physical inspection.
- The Institute is an educational institute.
- Major electrical power is available through one single phase & one three phase LT connection from MSEDCL.

Consumer number	Connected Electrical Load in KW	Date of connection
210960004617	3 HP ( Three Phase)	18/02/2003
210960166021	0. 5kW ( Single Phase )	15/12/1978

Details of the Electrical Energy Consumption as per received data is as under

Year	Total Units consumed No. of Units	Amount Paid	Avg. Monthly Units	Per Unit Charges Paid Rs.	Data / Bills received
2017-18	16722	189460	1393.50	11.33	12 months
2018-19	6884	70180	573.66	10.19	Discrete Data
2019-20	8963	145820	746.92	16.27	Discrete Data
2020-21	8058	243760	671.50	30.25	Discrete Data
2021-22	9660	184080	805	19.06	

- The computed energy usage 16722 KWh in 2017-18, 6884 KWh in 2018-19, 8963KWh in 2019-20, 8058 KWh in 2020-21& 9660 KWh in 2021-22. The average billed consumption is 1393.50 KWh per month for the year 2017-18. The average per month consumption noted during 2018-19 to 2019-20 varies between 573.66 KWh to 746.22 KWh. The post Covid average per month energy consumption is 671.50 KWh to 805KWh.
- No reliable measurements are available of Earth resistance at each earth point (measured in summer). We have conducted readings at Office, UPS , Server PPC point, Cooler Point, Computer Laboratory, Research room, Physics Laboratory, Library, Examination Hall . However potential difference between neutral and earth point is noted to be less than 5 Volts at few points but it is more than accepted value at major places.

- It is noted that the Voltage between Neutral Earth is very high at Chemistry, Computer, Research Laboratory & Office which may lead to frequent maintenance of the electrical & electronics parts.
- Incoming electrical power distribution is through singular 100 A ICTP Main switch and three phase Copper bus bar
- Laboratory equipments are used as per requirements of students and its usage is not available.
- Air conditioning units are installed at director cabin & IQAC cabin.
- Schematic of Electrical power distribution, control, protections and load connections is not available.
- The UPS/ Inverter Units are observed to be operational. Battery maintenance log book is not observed. .
- Institute has provided RO filter facility for drinking water. The filter maintenance log book is not observed. .

#### 4. Conclusion & Recommendations

1. The energy audit conducted is a preliminary energy audit.
2. Electrical power utilization is mainly for lighting and utilities.
3. The monthly energy bill of institute can be reduced with revision tariff revision arrangement with MSEDCL.
4. The institute is educational institute and the laboratory equipment usage is dependent on usage by students. The computed energy usage 16722 KWh in 2017-18, 6884 KWh in 2018-19, 8963KWh in 2019-20, 8058 KWh in 2020-21& 9660 KWh in 2021-22. The average billed consumption is 1393.50 KWh per month for the year 2017-18. The average per month consumption noted during 2018-19 to 2019-20 varies between 573.66 KWh to 746.22 KWh. The post Covid average per month energy consumption is 671.50 KWh to 805KWh
5. **Electrical Load on three phases should be balanced.**
6. **Earthing at all panels, equipments should be as per ISI & IES. It is recommended to check earth to neutral voltage frequently & accordingly earth points be treated to improve earthing. Earthing pits are not connected & where connected are of inferior quality & wire gauge.**
7. Detailed electrical schematic diagram should be prepared with load details, to enable further detailed audit.
8. Electrical power distribution panel room must be clean & should be easily accessible to cut of power in case of emergency.
9. UPS batteries need to be maintained appropriately and must be properly ventilated. Regular maintenance of batteries is must.
10. Stacking of wastage in control panel room should be avoided.
11. UPS batteries please be recycled properly. Regular maintenance of batteries is must to improve healthy condition of the computer peripherals.
12. Institution name board be illuminated using 50W LED ( at least Two Nos.) flood lights



## Annexure & references

- 1) Energy data sheets submitted by the institute.
- 2) Bills & other Certifications submitted by institute in connection with Energy Audit.

# Energy Audit Certificate

This is to certify that **Shetkari Shikshak Prasarak Mandal's, Krishna Mahavidyalaya, Rethare Bk.** has conducted preliminary Energy Audit of their campus. The energy activities & measures carried out by the institute have been physically varied on 23/03/2023.

The detail findings, conclusions & recommendations are annexed separately in the energy audit report.

Some of the energy conservations opportunities have been identified by the institute & some of the energy conservations & saving opportunities are suggested.

The positive attitude of the institute towards energy, environment & sustainability is appreciable



**Prof. Er. Dr. EA. Dhananjay Bhagawandas Devi,**

M.Tech.( Energy Tech.) ,B.E. ( Electrical), E. Á., D.C.S., D. N., M.I.E.  
Associate Professor, Electronics & Telecommunication Engineering Department,  
Karmaveer Bhaurao Patil College of Engineering, Satara  
Presently at Karmaveer Bhaurao Patil Poly technic, Varye, Satara  
Certified Energy Auditor (BEE) (EA-6470)  
Doctor of Naturopathy & Magneto Therapy  
Member: Indian Society of Heating, Refrigerating & Air Conditioning Engineers, New Delhi  
Life Member: Indian Society for Technical Education, New Delhi  
O. W .no.KBPPoly /2023-24/232 dated 21/05/2023