Energy Audit Report

Shri Pandurang Gramin Vikas Pratishthan's

Dilip Walase Patil

Arts, commerce & Science College

Nimgaonsawa, Tal: Junnar, Dist-Pune - 410 504

Prepared By

Aarchit Venture

Bharekar State Near Nanded City
Nanded Goan Pune 411041

PREFACE

An energy audit is a study of a plant or facility to determine how and where energy is used and to identify methods for energy savings. There is now a universal recognition of the fact that new technologies and much greater use of some that already exist provide the most hopeful prospects for the future. The opportunities lie in the use of existing renewable energy technologies, greater efforts at energy efficiency and the dissemination of these technologies and options. Energy has been identified as a crucial and balancing factor in the indices for sustainable development since the Earth Summit in 1992. Especially in the contemporary scenario, it is acknowledged that the heavy and unbalanced energy consumption adversely affects energy price and economic growth, and most countries now give priority to energy conservation methods. The Energy Conservation Act, 2001, defines Energy auditing as the verification, monitoring analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption. It facilitates a systematic approach to the energy management in a system, trying to balance the total energy input with its use. It identifies all the energy streams in a system and quantifies the use of energy according to its discrete functions. The energy audit of Dilip Walase Patil **Nimgaonsawa, Tal: Junnar, Dist-Pune - 410 504** was carried out by Energy Audit team. This report is our mite in contributing to the larger picture of effective energy management and conservation. As is known, energy auditing is an on-going process, a part of larger procedure to ensure long-term sustainable development. We have enlisted plausible solutions based on the outcome of our analysis of data, and our recommendations, which can be implemented wholeheartedly in the campus in order to ensure minimizing energy waste and maximizing energy potential. We hope in all earnest that these will be given its due and that the audit will be fruitful in terms of energy conservation

CONTENTS

1. ACKNOWLEDGEMENT

2. SUMMARY

3. INTRODUCTION OF INSTITUTE

4. INTRODUCTION OF ENERGY AUDIT

5. METHODOLOGY

6. PURPOSE OF ENERGY AUDIT

7. AUDIT OBJECTIVES & SCOPE

8. SYSTEM STUDIES DURING ENERGY AUDIT

9. ENERGY CONSUMPTION PROFILE

    a) LED ENVENTORY DECEMBVER 2019

    b) TOTAL ANNUAL LIGHT POWER USED

10. BEST PRACTICES FOR ENERGY AUDIT

11. RECOMENDATION 12. CONCLUSION

1. SUMMARY

The objective of the audit was to study the energy consumption pattern of the facility, identify the areas where potential for energy/cost saving exists and prepare proposals for energy/cost saving along with investment and payback periods.
The salient observations and recommendations are given below.
Dilip Walase Patil **Nimgaonsawa, Tal: Junnar, Dist-Pune - 410 504** uses energy in the following forms:

a. Electricity from MahaVitaran / MahadisCom (Local Discount)-13000 units

b. Natural light & Ventilation

Electrical energy is used majorly for various applications, like

- Computers
- Air-Conditioning
- Lighting
- Fans / airy classrooms

2. INTRODUCTION OF INSTITUTE

Shri Pandurang Gramin Vikas Pratishthan's, Dilip Walase Patil College of Arts, commerce &Science College Nimgaonsawa, Tal. Junnar, Dist. Pune We are happy to inform you that our institution plays vital role in developing rural area of the Eastern part of Pune district by giving higher education to the youth especially girls. The Shri Pandurang Gramin Vikas Pratishthan's Dilip Walase Patil College of Arts, commerce &Science College Nimgaonsawa was established in 27th July 2009 by the great vision of our honorable shri Pandurang Pawar Saheb .The college is situated at Nimgaonsawa in Junnar taluka,the eastern part of Pune district .The college is covered the area of 4 acres campus including the playground and with green lush trees and pollution free atmosphere. The college is permanently non grant, affiliated to the Savitribai Phule Pune University, Pune. The Institution offers 3 years undergraduate degree program viz. Bachelor of Arts, in Marathi, English, History & Economics, Bachelor commerce & Bachelor of Science in Chemistry. Curriculum offered by the college is related to the today's requirement of the nation to give quality education to the youth and aimed at overall personality and career development of the students. The object of the Institution is to give employment to the youth especially girls in the rural area and to speak about the staff of the college very kind hearted and intelligent teachers having good qualification give knowledge to the students. The facilities of Laboratories, library and spacious playground is available in the college.The institution has NSS unit of 100 students various extension activities are conducted in the year by this NSS volunteers. Women Empowerment Program is conducted with the grand object of empowering women and making them employable by giving them quality education The institution has also 'Earn and Learn Scheme' to help the poor and needful students .The Institution has also Anti Ragging Committee for the security of girls. Teaching staff is engaged in improving their qualification and quality to do this they are trying to write and

publish national and international journals and research papers. The management and whole staff take effort to increase the quality of the education and also the institution.

3. INTRODUCTION OF ENERGY AUDIT

Energy is a primary and most universal measure of all kind of work by human being and nature. It is one of the real contributions to the economic development of any nation. On account of the developing nation, the energy sector shows acceptance up to a significant level to expand energy requirements based on colossal investments to meet them. The aim of this report is to describe the indispensability of Energy in the present time based on the bulk utilization of different forms of energies to cater the demands. An Energy Audit is an investigation of a plant or office to decide how and where energy is utilized and to distinguish diverse strategies for energy saving Identification of the areas consuming major energy need prior attention to look for energy saving potential. The energy audit is the most effective tool for optimizing the efficiency of the plant without affecting the output of the system. Most of the country in the world is focused on the improving energy efficiency in the various sector. According to the present scenario, it is more important to the next generation to get awareness about the efficient use of energy resources, when they are taking education in school. In this respects, advancement of energy proficiency in school is being advanced through the foundation of energy clubs. An improvement in energy efficiency within your organization can potentially bring significant benefits. With this in mind, Aarchit Venture has developed energy audit services to help you find the best information for improvement opportunities. Energy audit services are a key part of our dedicated energy efficiency services and the first step towards your comprehensive energy management strategy. This is the important part of India’s effort to improve its energy efficiency, energy quality, and energy intensity. The government of India promoting the energy efficiency in India through Energy Conservation Act 2001. The act instructs the central Government and Bureau of Energy Efficiency to find a way to encourage and advance energy productivity in all area of the economy. Government of India also promoting energy efficiency and awareness at school level by implementing student building Energy Audit isthe important part of India’s effort to improve its energy efficiency, energy quality, and energy intensity. The government of India promoting the energy efficiency in India through Energy Conservation Act 2001. The act instructs the central Government and Bureau of Energy Efficiency to find a way to encourage and advance energy productivity in all area of the economy. Government of India also promoting energy efficiency and awareness at school level by implementing student building capability programmed under Energy Conservation awareness scheme

.

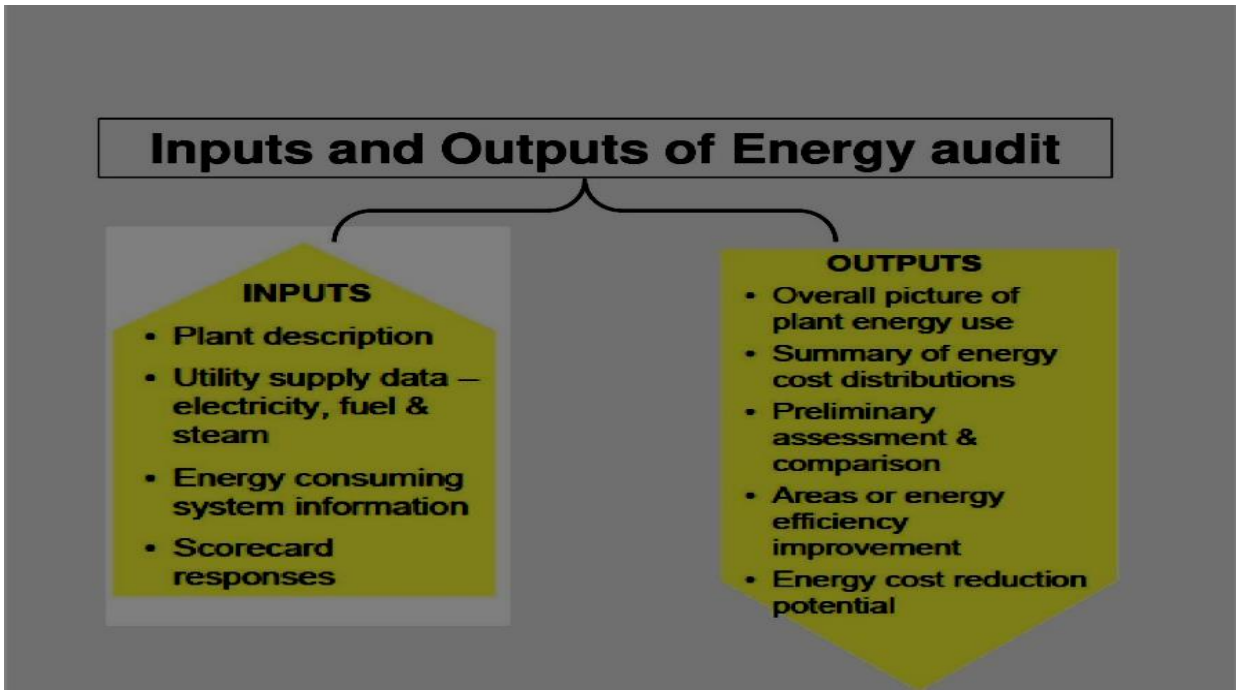
4. METHODOLOGY

Energy audits are primarily classified into

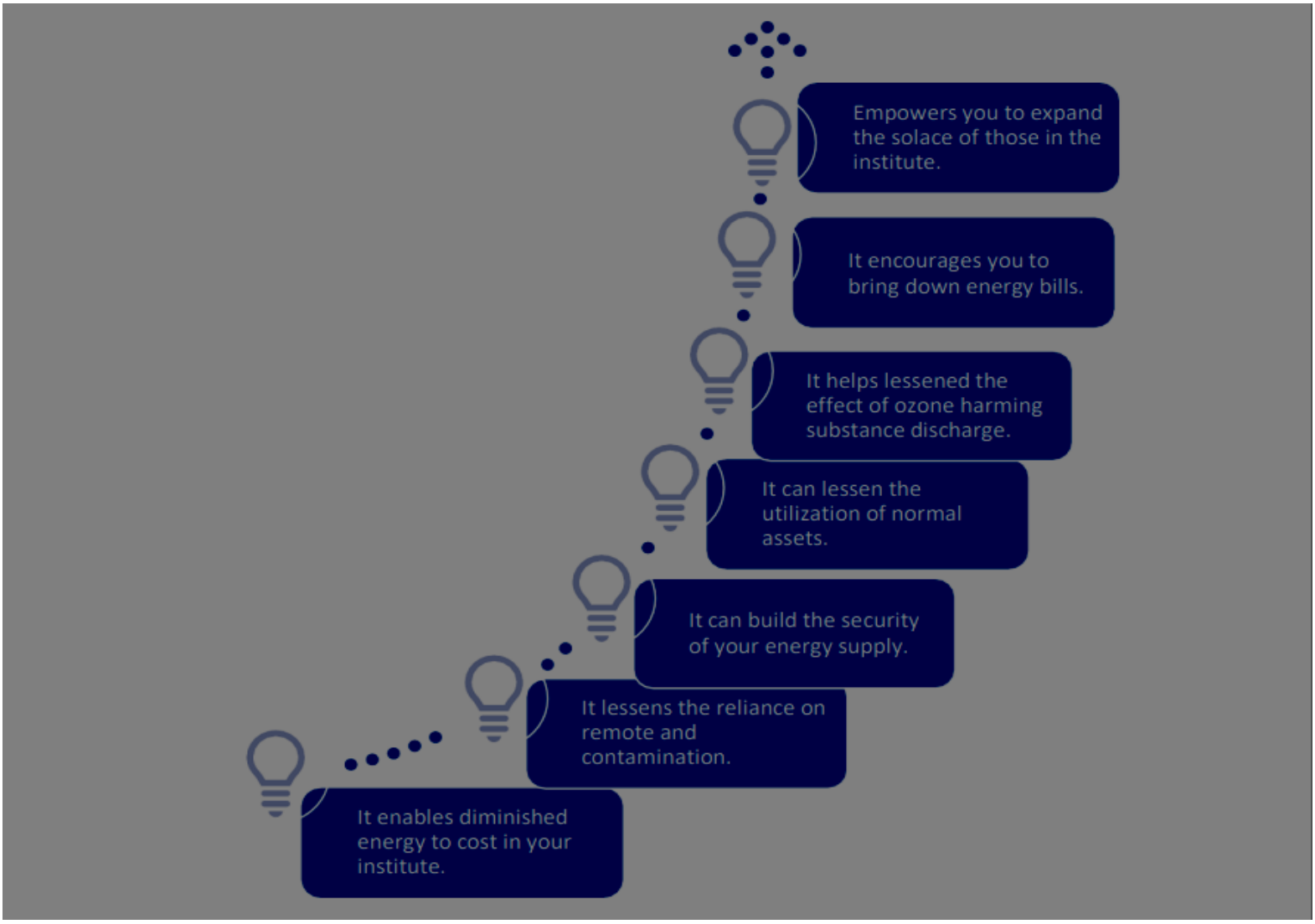
- Preliminary Audit
- Detailed Audit

Since the Detailed Audit is meant for industry, and because of the limited size and the amount of energy consumption of the institution, the Preliminary Audit method was chosen for this year.

Scope of work and methodology were as per the proposal. While undertaking data collection, field trials and their analysis, due care was always taken to avoid abnormal situations so as to generate normal/representative pattern of energy consumption at the facility.



5. PURPOSE OF ENERGY AUDIT



6. OBJECTIVES

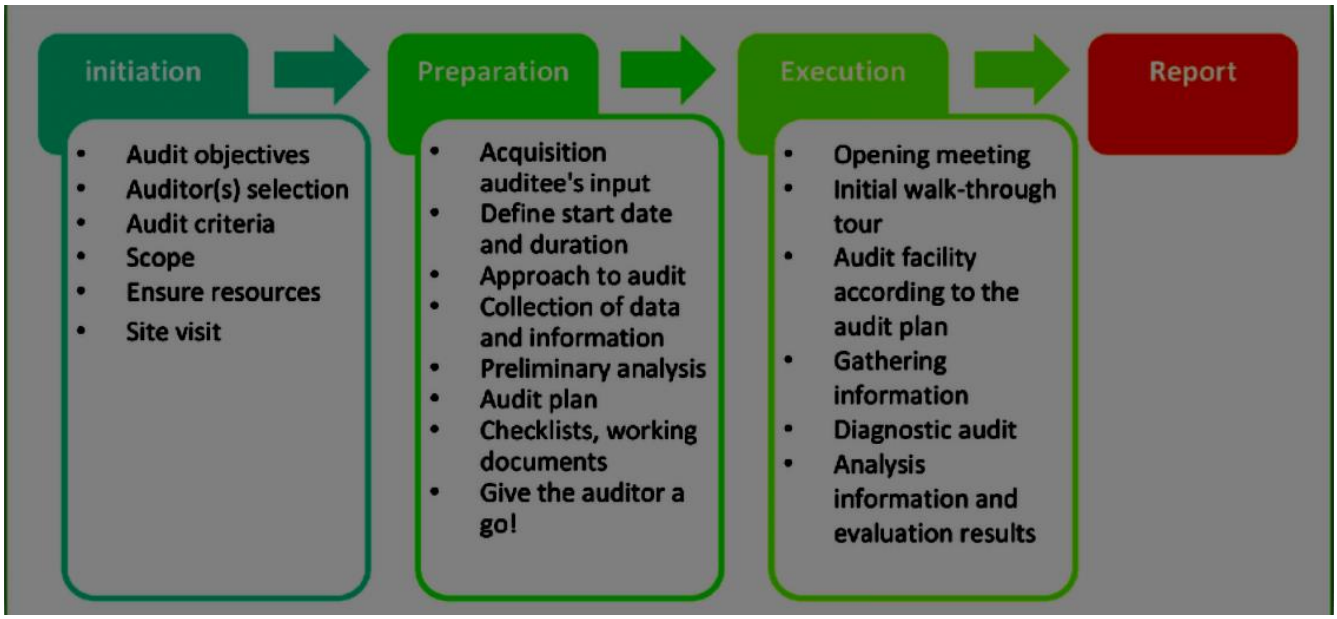
A. Verify the steps adopted for energy management in the campus.

B. Spot the inefficient or inadequate practices, if any.

C. Improve the energy preserving measures and methods.

D. Identify potential energy saving opportunities.

E. Formulate feasible steps and measures to be adopted in the campus.



7. SCOPE OF ENERGY AUDIT

The work of energy audit has the objective of finding opportunities of energy conservation, saving and to recommend action plan with calculation of investment option and energy saving. The scope of energy audit is,

1. To study and audit MAHADISCOM / Maha Vitaran bills.
2. Study of lighting system and its measurement.
3. Harmonic measurement and its study.
4. Splitting of air conditioner / other high voltage consumption devices.
5. Identification of energy saving opportunity and energy conservation

8. SYSTEM STUDIED DURING ENERGY AUDIT

CHECK POINTS	
	Monthly electricity is studied and analysed.
	Lighting system in campus is studied and illumination is measured.
	UPS load measurement (harmonic measurement at UPS input and main feeder after electrical meter).
	Study of energyutilization requirement.
	Split air conditioner operation.
	Energy saving opportunities is identified.

The identified saving opportunities are summarized for review and implementation.

9. ENERGY CONSUMPTION

The loads were segregated based on the end use as lighting and fans, Computer / printers, water pumping. Quantification, types and necessary measurements were carried out. The details are given below

a) LED INVENTORY (latest during audit)

Wattages	36W	18W	10W	5W	35W	56W	48W
Total	149	95	36	3	9	18	23
Total Wattage	5364	1710	360	15	315	1008	1104

Wattages	36W	18W	10W	5W	35W	56W	48W
Total Purchase Lights	150	100	36	3	10	20	30
Total Used Lights	149	95	36	3	9	18	23
Total Balance	01	05	0	0	01	02	07

b) TOTAL ANNUAL LIGHT POWER USED

Sr No.	**Floor**	**Wattage**
1		3396
2		4982
3		3374
Total		**11752**
Annual power in Watt		141024
Annual power in K W		**141KW**

10. BEST PRACTICES FOR ENERGY SAVING

Open Space in front

Airy & Lighted classrooms

ICT enabled, but power saving, Airy & Lighted classrooms

Zoology Lab.

Chemistry Lab.

Physics Lab.


Comman Room
For Girls
GPS Map Camera
Nimgaon Sawa, Maharashtra, India
34G7+6M6, Nimgaon Sawa, Maharashtra 410504, India
Lat 19.075505°
Long 74.113954°
17/07/23 12:48 PM GMT +05:30
Google

Institute is advising student as well as staff to use battery powered vehicles, some of them are shown above

11. RECOMMENDATION

1. Solar energy application is recommended for battery charging of UPS.

2. All Classrooms and labs to have Display Messages regarding optimum use of electrical appliances in the room like, lights, fans, computers and projectors.

3. Voltage and current harmonic measured are beyond permissible limit which needs harmonic mitigation treatment.

4. Some CRT monitor of PCS are recommended to replace with energy efficient LCD monitors to conserve energy.

5. Motor pump set is recommended to provide power capacitor.

6. Air conditioner shall be operated between temperature range of 24-250C to maintain lower cooling load on compressor to save energy.

7. Turn ON the AC when required and turn it OFF when students will not be in their classrooms.

8. Install MCB for separate room so that we do not need to switch OFF all the loads when walkout from the classroom.

9. Use advance system adjust the temperature setting of AC according to the weather conditions.

10. Use light color for wall which reflect day light to improve the illumination.

11. To maintain the illumination, De-dust the lightning fixture.

12. Setting the computers, monitors etc. to sleep mode when not required which saves approximately 40% energy

13. Occupancy sensors detect indoor activity within a certain area. They provide convenience by turning lights on automatically when someone enters a room, and save energy by turning lights off soon after the last occupant has left the room. Occupancy sensors must be located where they will detect occupants or occupant activity in all parts of the room.

14. Use lighting controls to automatically turn lights on and off as needed, and save energy. Of course, you can save energy by turning off lights when they're not needed, but sometimes we forget or don't notice that we've left them on. The most common types of lighting controls include:

- Dimmers
- Motion, occupancy, and photo sensors
- Timers

15. Motion sensors automatically turn outdoor lights on when they detect motion and turn them off a short while later. They are very useful for outdoor security and utility lighting.

16. Dimmer controls provide variable indoor lighting. When we use dim light bulbs, it reduces their wattage and output, which helps save energy.

17. Timers can be used to turn on and off outdoor and indoor lights at specific times. There are two types of timers: manual timers, which plug into an electrical outlet for controlling objects such as lamps or light strings.

18. You can use photo-sensors to prevent outdoor lights from operating during daylight hours. This can help save energy because you don't have to remember to turn off your outdoor lights

12. CONCLUSION

Energy audit is an effective tool in identifying and perusing a comprehensive energy management program. A careful audit of any type will give the organization a plan with which it can effectively manage the organization energy system at minimum energy cost. In this paper a detailed study has been made to reduce the electrical energy consumption in the campus of Nutan Arts Commerce and Science College Rajapur . It highlights the amount of energy savings, thereby reducing theenergy crisis considerably. After implementing recommendations energy audit of institute, theelectrical energy saving per year can be achieved as 20% to 30% and total cost saving of electrical bill per year can be 20% to 30%