Energy Audit Report

Shri Brahamanand Swami Shikshan Prasark Mandal's

ARTS AND COMMERCE COLLEGE DODI (Bk)

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 Shri Brahamanand Swami Shikshan Prasark Mandal's Arts and Commerce College 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 a 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

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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.

Shri Brahamanand Swami Shikshan Prasark Mandal's Arts and Commerce College 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

The higher education challenge for rural area in the Maharashtra is three fold, namely necessary infrastructure, permanant qualified teaching faculty and appropriate job oriented courses. Shri Brahamanand Swami Shikshan Prasark Mandal's is a leading educational institution in Maharashtra. It was founded and named after the grant. Sant Shri Bramhanand Swami . Let dada patil kedar was the founder of the institution. All his life he remained a revolutionary and was fully devoted to social cause. The present institution Shri Bramhanand Swami Shikshan Prasarak Mandal was established in 1979 to provided education to the under privileged and socially and economically weaker section of society. The college is committed to promote innovation in learning processes and to emerge as a center of academic excellence. The college is started with the motto 'Vidya Vinayan Shobate' in rural area of Nashik district.

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 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 capability programmed under Energy Conservation awareness scheme

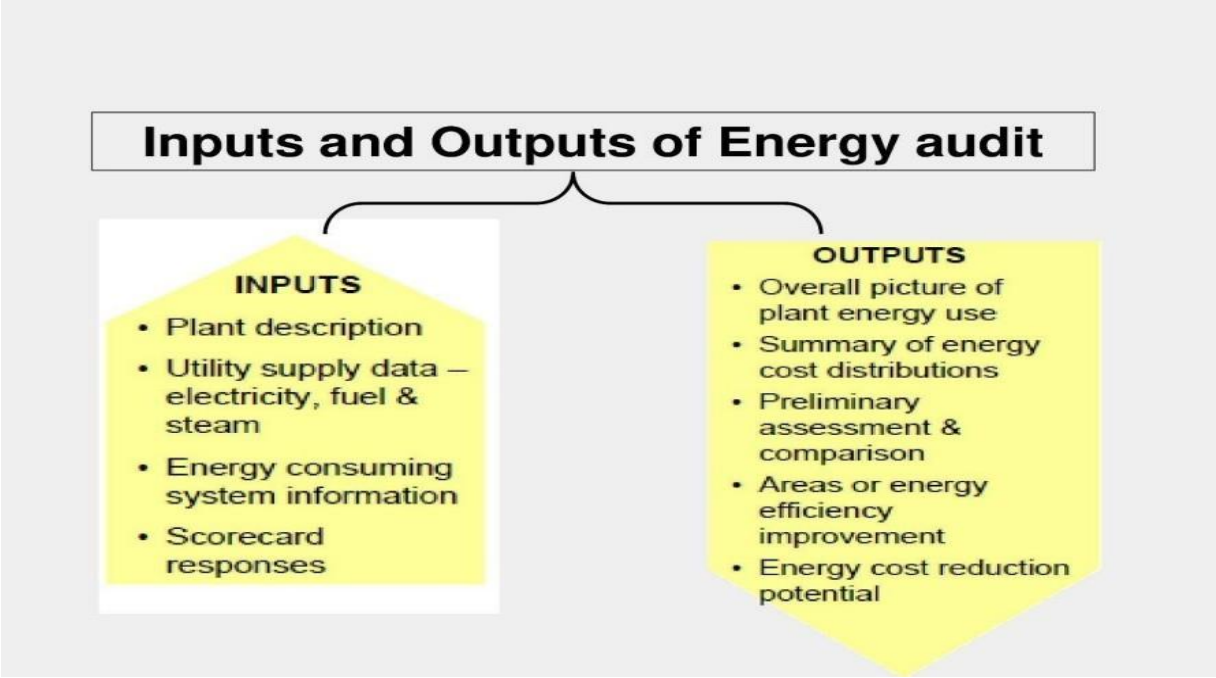
4. METHODOLOGY

Energy audits are primarily classified into

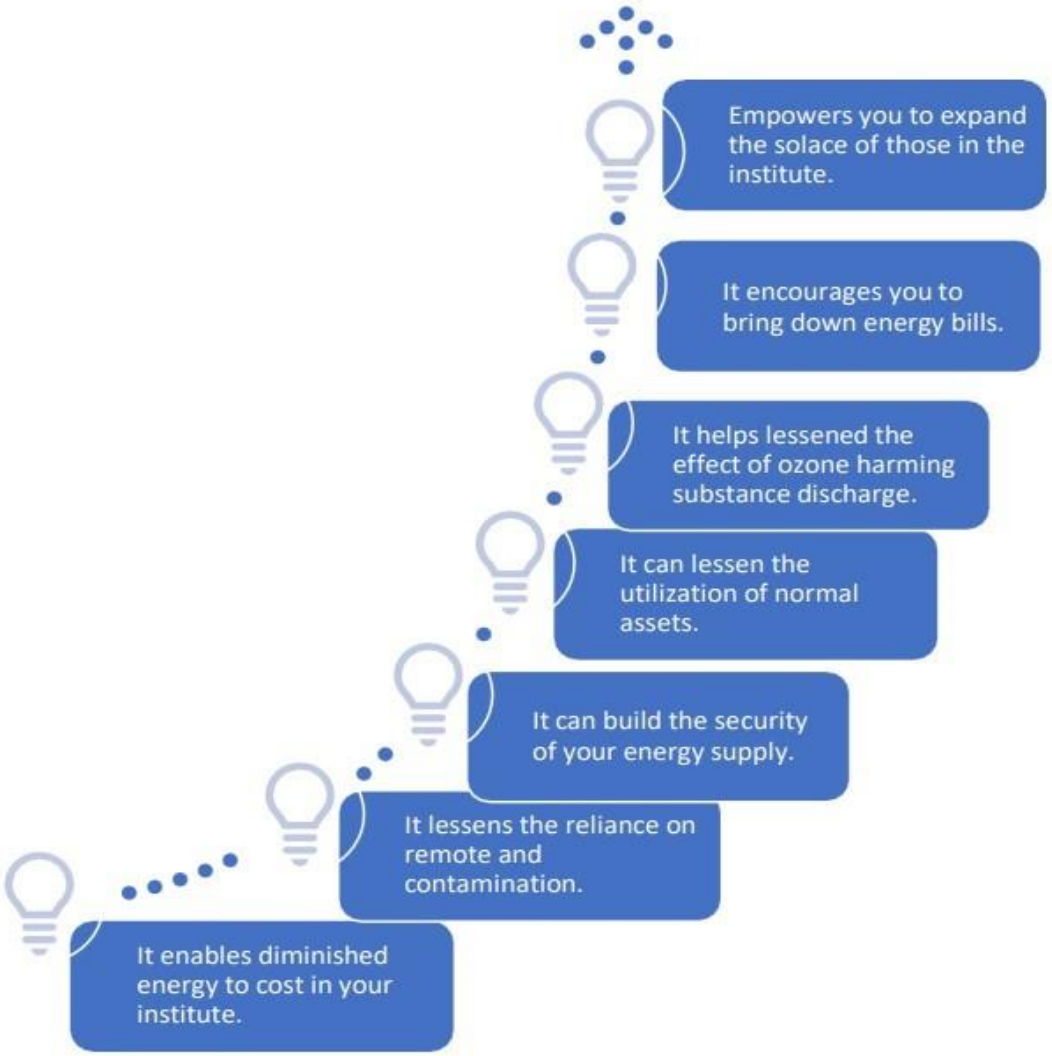
- Preliminary Audit
- Detailed Audit

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

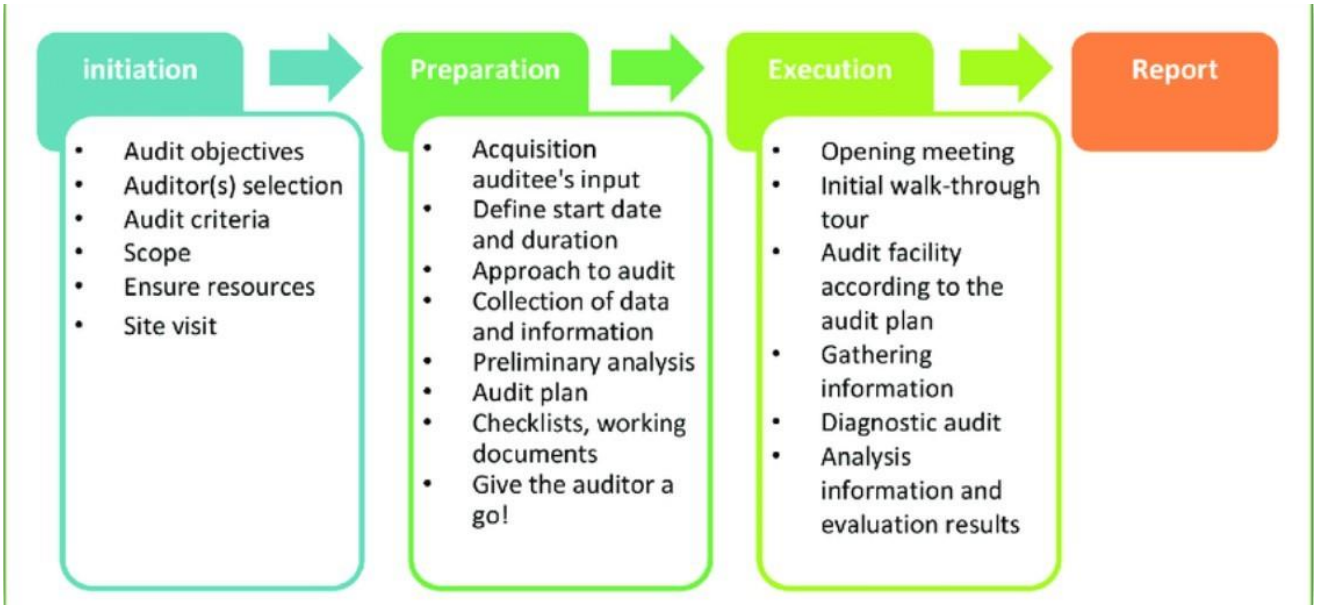
A. Verify the steps adopted for energy management in the campus.

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 / Mahavitaran 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

Lighting System Details

Sr No	Room Type	Tube Light	Bulb	Led
1	Main Gate	0	0	01 Focus
2	Entrance Lobby	0	0	03
3	Ground	0	0	10
4	Road	0	0	01
5	Campus	06	0	02
6	Rooms	30	0	28

Equipment List

Sr No	Particular	Quantity
1	Computer	25
2	Printer	7
3	Scanners	4
4	Xerox Machine	2
5	Projector	6
6	Water Pumps	1
7	Water Cooler	1
8	Water Filter	1
9	Coffee Machine	1

10. ANALYSIS:

Lighting Energy Consumption

The lighting energy consumption has been estimated for various areas within the college premises.

Area	Tube Light	Bulb	LED	Total Energy Consumption (kWh)
Main Gate	0	0	1	1
Entrance Lobby	0	0	3	3
Ground	0	0	10	10
Road	0	0	1	1
Campus	6	0	2	8
Rooms	30	0	28	58

Electronic Equipment Energy Consumption

The energy consumption for various electronic equipment has been estimated based on the assumed power consumption values.

Equipment	Quantity	Power Consumption (kW)	Total Energy Consumption (kWh)
Computer	25	0.3	7.5
Printer	7	0.5	3.5
Scanners	4	0.1	0.4
Xerox Machine	2	0.5	1
Projector	6	0.7	4.2
Water Pumps	1	1.5	1.5
Water Cooler	1	0.2	0.2
Water Filter	1	0.1	0.1
Coffee Machine	1	1.2	1.2

Recommendations:

Based on the estimated energy consumption, it is evident that both lighting and electronic equipment contribute significantly to the college's overall energy usage. To improve energy efficiency and reduce consumption, the following recommendations are proposed:

1. **LED Conversion for Lighting**: Consider replacing conventional lights with energy-efficient LED lights across the campus to minimize lighting energy consumption.

2. **Power Management Strategies**: Implement power management strategies for electronic equipment, including turning off devices when not in use, scheduling shutdowns, and optimizing usage during non-peak hours.
3. **Awareness and Training**: Conduct energy conservation awareness campaigns and provide training to staff and students on energy-saving practices.
4. **Regular Monitoring and Reporting**: Establish a system to monitor and track energy consumption regularly, allowing for continuous improvement and informed decision-making.
5. **Energy Audits**: Conduct periodic energy audits to assess the effectiveness of implemented energy-saving measures and identify further opportunities for improvement.

By implementing these recommendations, Dodi College can significantly reduce energy consumption and contribute to a sustainable and environmentally friendly campus.

11. SOLAR ENERGY USE

Shri Brahamanand Swami Shikshan Prasark Mandal's Arts and Commerce College has integrated a solar energy system consisting of 335Wp solar panels and a 5kW inverter provided by UTL. This solar energy system is a significant step toward sustainable energy practices and reducing the college's dependence on conventional power sources.

Solar Panel Specifications

- **Solar Panel Make:** UTL
- **Solar Panel Capacity:** 335 Watts peak (Wp)

Inverter Specifications

- **Inverter Make:** UTL
- **Inverter Capacity:** 5 Kilowatts (kW)

Solar Energy Generation and Utilization

The solar panels installed at the college harness sunlight and convert it into electricity, utilizing photovoltaic technology. The generated solar power is then channeled to the 5kW inverter, which converts the direct current (DC) electricity produced by the solar panels into alternating current (AC) electricity suitable for use within the college premises.

The solar energy generated helps to power various electrical loads within the college, effectively offsetting a portion of the energy requirements from the main power grid. This sustainable energy source contributes to a reduction in the overall carbon footprint and energy expenses of the college.

Environmental Impact and Benefits

Utilizing solar energy offers several environmental and financial benefits to Shri Brahamanand Swami Shikshan Prasark Mandal's Arts and Commerce College:

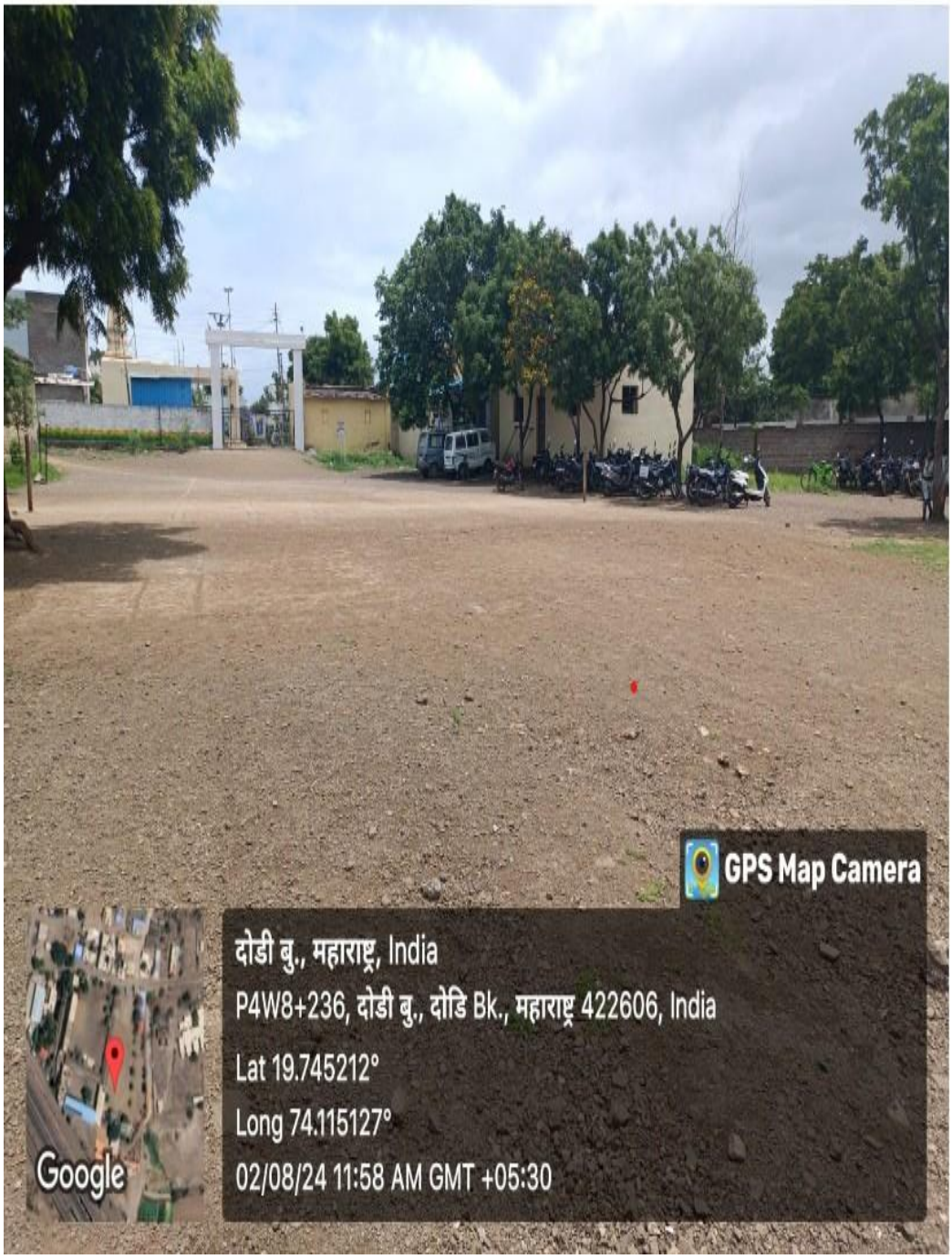
1. **Reduced Carbon Emissions**: Solar energy is a clean, renewable source of power that significantly reduces carbon dioxide and other greenhouse gas emissions, contributing to a greener environment.
2. **Financial Savings**: By harnessing solar energy, the college can save on electricity bills and potentially earn revenue through excess energy fed back into the grid.
3. **Sustainable Energy**: The adoption of solar power aligns with the college's commitment to sustainability and demonstrates its role as a responsible environmental steward.

12 BEST PRACTICES FOR ENERGY SAVING

Open Space in front

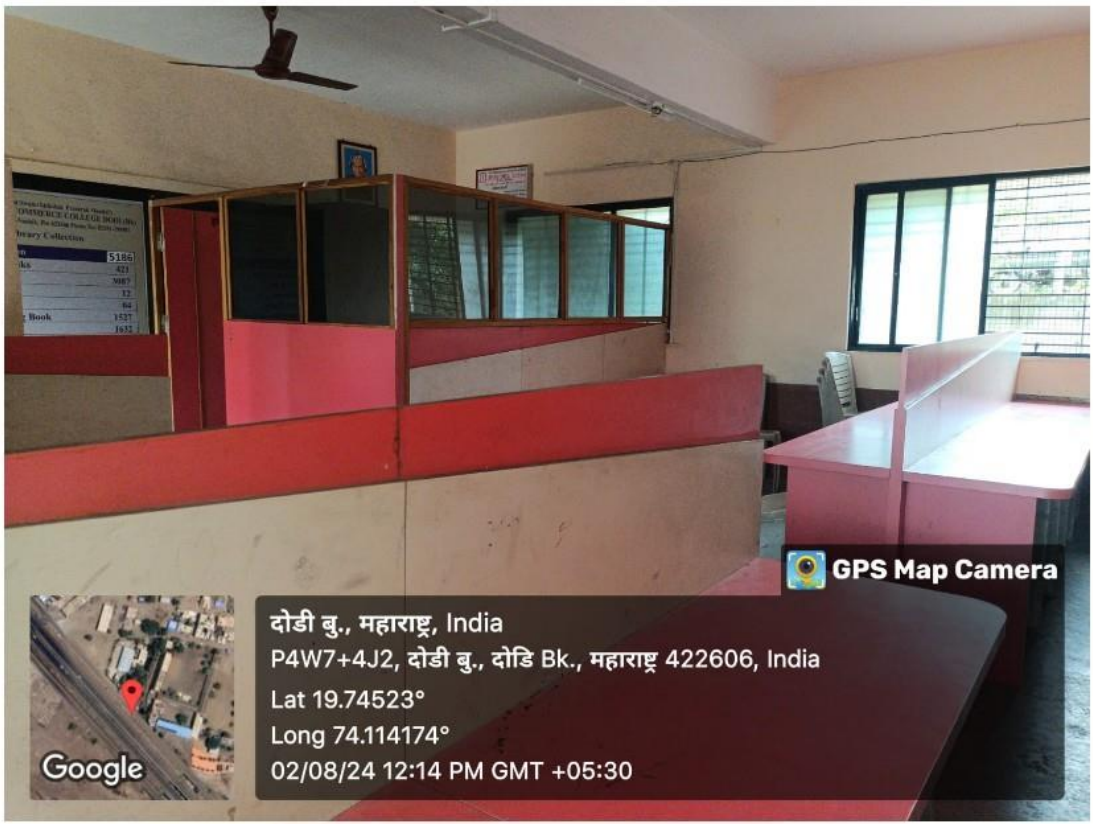
AARCHIT VENTURE PUNE

Open area in front of college



Well lit & Well ventilated Classroom

Well lit & Well Ventilated Reading Hall



Well lit & Well Ventilated Staff Room

Computer Lab

12. GENERAL CONSERVATION TIPS

1. **Energy-Efficient Lighting:**

- Replace traditional bulbs with energy-efficient LED lights to significantly reduce energy consumption.
- Install occupancy sensors and timers to control lighting in unoccupied areas.

2. **Optimize HVAC Systems:**

- Regularly maintain and service heating, ventilation, and air conditioning (HVAC) systems to ensure they operate efficiently.
- Set thermostats at energy-saving temperatures, especially during non-operational hours.

3. **Manage Computer Labs and IT Equipment:**

- Encourage shutting down computers, monitors, and other IT equipment when not in use.
- Enable power-saving settings on computers and monitors to reduce energy consumption during periods of inactivity.

4. **Educate and Raise Awareness:**

- Conduct energy conservation awareness campaigns to educate students, staff, and faculty about the importance of saving energy and simple practices to achieve it.

5. **Promote Natural Daylight:**

- Utilize natural daylight by arranging spaces and seating to maximize natural light penetration, reducing the need for artificial lighting.

6. **Energy-Efficient Appliances:**

- Encourage the use of ENERGY STAR-rated appliances and equipment in common areas and offices to reduce energy usage.

7. **Insulation and Weatherproofing:**

- Insulate buildings to reduce heat gain in summers and heat loss in winters.

- Seal windows, doors, and other openings to prevent air leaks.

8. **Water Conservation:**

- Promote water conservation to indirectly save energy required for water heating.
- Install low-flow faucets and shower heads and fix leakages promptly.

9. **Utilize Renewable Energy:**

- Explore options for solar power generation on rooftops or open areas to supplement the energy needs of the college.

10. **Incorporate Energy Audits:**

- Conduct regular energy audits to identify areas for improvement and track energy usage patterns.

11. **Green Campus Initiatives:**

- Plant trees and maintain green spaces to enhance natural cooling and create a sustainable environment.
- Implement rainwater harvesting systems to reduce dependency on external water sources.

12. **Transportation Strategies:**

- Encourage carpooling, cycling, and use of public transport among students and staff to reduce fuel consumption and emissions.

13. **Waste Reduction and Recycling:**

- Promote waste reduction and recycling programs to minimize energy consumption associated with waste management.

14. **Engage Students and Faculty:**

- Involve students and faculty in energy conservation initiatives through projects, workshops, and competitions.

15. **Continuous Monitoring and Feedback:**

- Regularly monitor energy consumption and progress towards energy-saving goals, and provide feedback to stakeholders.

13. CONCLUSION

The energy audit conducted at Shri Brahamanand Swami Shikshan Prasark Mandal's Arts and Commerce College, has provided valuable insights into the energy consumption patterns and opportunities for optimization. The assessment included a thorough evaluation of lighting and electronic equipment energy consumption, as well as an analysis of the solar energy system in place.

The total energy consumption for the college is estimated at 133.4 kWh, with lighting accounting for approximately 72% and electronic equipment constituting the remaining 28%. This distribution highlights the significance of addressing both lighting and electronic equipment efficiency to achieve optimal energy consumption.

The integration of a solar energy system, featuring UTL solar panels with a capacity of 335 Watts peak (Wp) and a 5kW UTL inverter, is a commendable step towards sustainability. The solar system has the potential to generate an estimated [insert estimated annual kWh generation] kWh annually, significantly reducing the college's reliance on conventional power sources and minimizing its carbon footprint. Recommendations have been proposed to enhance the effectiveness of the solar energy system, optimize energy consumption, and align the college with sustainable energy practices. These recommendations encompass expanding solar panel capacity, integrating energy storage solutions, enhancing educational initiatives, monitoring and maintaining the solar system, conducting financial analysis, and aligning solar expansion with sustainability goals.

By implementing these recommendations, Shri Brahamanand Swami Shikshan Prasark Mandal's Arts and Commerce College can strive towards a future of reduced energy consumption, financial savings, and a positive environmental impact. The college has the opportunity to set an example for the community, fostering a culture of sustainability and responsible energy usage.

Environment Audit

Report

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Acknowledgment

We at Aarchit Venture, Pune wish to express our sincere gratitude to the management of Shri Brahamanand Swami Shikshan Prasark Mandal's Arts and Commerce College for assigning the work of Environmental Audit of college campus.

We appreciate the co-operation and support extended to our team members during the entire tenure of field study.

We are also thankful to various Head of Departments & other Staff members for helping us during the field measurements.

We are also thankful to all other staff members who helped us during the Measurements at the field and for giving us the necessary inputs to carry out this vital exercise.

Executive Summary

After the Field measurements & analysis, we present herewith important observations made and various measures to reduce the dependency on Natural resources & reduce the pollution.

Shri Brahamanand Swami Shikshan Prasark Mandal's Arts and Commerce College consumes various resources for day to day operations, namely: Air, Water, Electrical Energy & LPG.

Various Pollution due to College Activities:

- Air pollution: Mainly CO_2 on account of Electricity & LPG Consumption
- Solid Waste: Bio degradable Kitchen Waste, Garden Waste
- Liquid Waste: Human liquid waste

Present Level of CO_2 Emissions:

CO2 Emissions from Lighting:

- **CO2 Emissions from Lighting** = 96 kWh * 0.5 kgCO2/kWh
- **CO2 Emissions from Lighting** ≈ 48 kgCO2

CO2 Emissions from Electronic Equipment:

- **CO2 Emissions from Electronic Equipment** = 37.4 kWh * 0.5 kgCO2/kWh
- **CO2 Emissions from Electronic Equipment** ≈ 18.7 kgCO2

Total CO2 Emissions

- **Total CO2 Emissions** = CO2 Emissions from Lighting + CO2 Emissions from Electronic Equipment
- **Total CO2 Emissions** ≈ 48 kgCO2 + 18.7 kgCO2
- **Total CO2 Emissions** ≈ 66.7 kgCO2

Conclusion

Based on the provided energy consumption data and an assumed carbon intensity of 0.5 kgCO2/kWh, the estimated total CO2 emissions from energy usage at Jai Shriram College are approximately 66.7 kgCO2. Efforts to reduce these emissions through energy efficiency measures and the integration of renewable energy sources can significantly contribute to a more sustainable environment.

The various projects already implemented for Environmental Conservation:

- Usage of Energy Efficient BEE STAR Rated AC
- Usage of Natural Day light in corridor
- Usage of Eco friendly Vehicle

Notes & Assumptions:

1. **1 kWh** of Electrical Energy releases **0.8 Kg of CO_2** into atmosphere
2. 1 kWp Solar PV plant generates 5 kWh/day Electrical Energy for 300 days in an year.

Abbreviations

AC	:	Air conditioner
PES	:	Progressive Education Society
CFL	:	Compact Fluorescent Lamp
FTL	:	Fluorescent Tube Light
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
PF	:	Power Factor
M D	:	Maximum Demand
PC	:	Personal Computer
MSEDCL	:	Maharashtra State Electricity Distribution Company Ltd

Introduction

1.1 Important Definitions:

1.1.1 Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.1.2. Environmental Audit: Definition:

An audit which aims at verification and validation to ensure that various environmental laws are compiled with and adequate care has been taken towards environmental protection and preservation

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.1.3. Environmental Pollutant:

Means any solid, liquid and gaseous substance present in the concentration as may be, or tend to be, injurious to Environment.

1.1.4. Relevant Environmental Laws in India: Table No-1:

1927	The Indian Forest Act
1972	The Wildlife Protection Act
1974	The Water (Prevention and Control of Pollution) Act
1977	The Water (Prevention & Control of Pollution) Cess Act
1980	The Forest (Conservation) Act
1981	The Air (Prevention and Control of Pollution) Act
1986	The Environment Protection Act
1991	The Public Liability Insurance Act
2002	The Biological Diversity Act
2010	The National Green Tribunal Act

1.1.5. Some Important Environmental Rules in India: Table No-2:

1989	Hazardous Waste (Management and Handling) Rules
1989	Manufacture, Storage and Import of Hazardous Chemical Rules
2000	Municipal Solid Waste (Management and Handling) Rules
1998	The Biomedical Waste (Management and Handling) Rules
1999	The Environment (Siting for Industrial Projects) Rules
2000	Noise Pollution (Regulation and Control) Rules
2000	Ozone Depleting Substances (Regulation and Control) Rules

2011	E-waste (Management and Handling) Rules
2011	National Green Tribunal (Practices and Procedure) Rules
2011	Plastic Waste (Management and Handling) Rules

1.1.6 National Environmental Plans & Policy Documents: Table No-3:

1.	National Forest Policy, 1988
2.	National Water Policy, 2002
3.	National Environment Policy or NEP (2006)
4.	National Conservation Strategy and Policy Statement on Environment and Development, 1992
5.	Policy Statement for Abatement of Pollution (1992)
6.	National Action Plan on Climate Change
7.	Vision Statement on Environment and Human Health
8.	Technology Vision 2030 (The Energy Research Institute)
9.	Addressing Energy Security and Climate Change (MoEF and Bureau of Energy Efficiency
10	The Road to Copenhagen; India's Position on Climate Change Issues (MoEF)

Objectives

1. To study present usage of Natural resources the College is consuming
2. To Study the present pollution sources
3. To study various measures to make the campus Self sustainable in respect of Natural resources
4. To suggest the various measures to reduce the pollution: Air, Water, Noise

Audit Methodology:

1. Study of College as System
2. Study of Electrical Energy Consumption
3. Study of CO2 emissions
4. Suggestions on usage of Renewable Energy

General Details of College

No	Head	Particulars
1	Name of Institution	Shri Brahamanand Swami Shikshan Prasark Mandal's Arts and Commerce College
2	Address	Tal - Sinnar, Dist - Nashik (422606)
3	Affiliation	Savitribai Phule Pune University

Study of Consumption of Various Resources

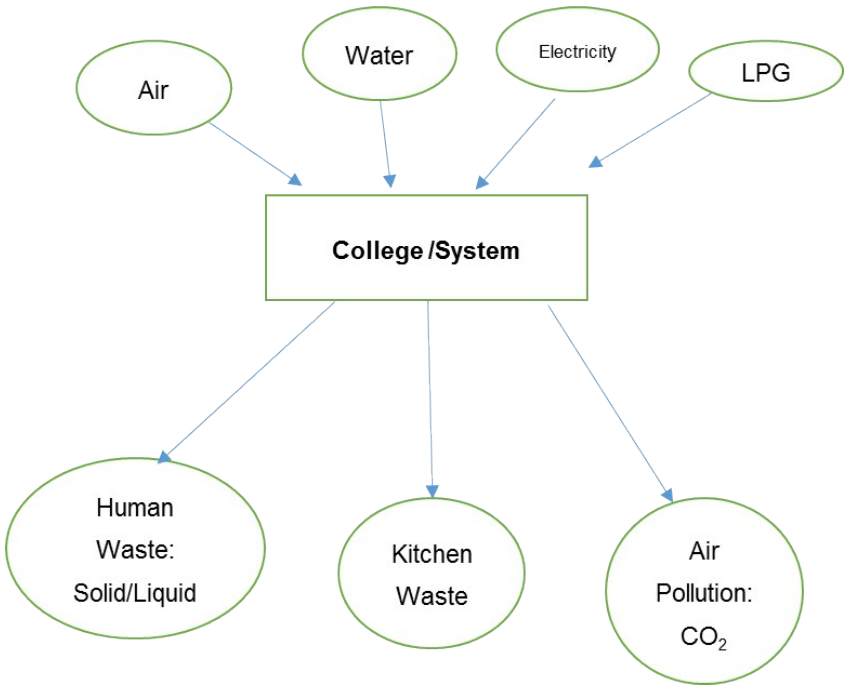
The Institute consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy
4. Liquefied Petroleum Gas

Also, college emits following pollutants to environment

1. Human Waste: Solid/ Liquid
2. Kitchen waste
3. Air pollution

We try to draw a schematic diagram for the College System & Environment as under.



Now we compute the Generation of CO2 on account of consumption of Electrical Energy & LPG as under.

The calculation of electrical energy consumption by college can be given as,

Table 2.1: Electrical Energy Consumption

No	Month	Energy (kWh)
1	Jun-24	20,521
2	May-24	17,499
3	Apr-24	20,976
4	Mar-24	25,433
5	Feb-24	22,635
6	Jan-24	22,185
7	Dec-23	23,893
8	Nov-23	14,360
9	Oct-23	19,078
10	Sep-23	9,953
11	Aug-23	9,694
12	Jul-23	9,382
	Total	**215,609**
	Maximum	**25,433**
	Minimum	**9,382**
	Average	**17,967**

Variation of Monthly Electrical Energy Consumption

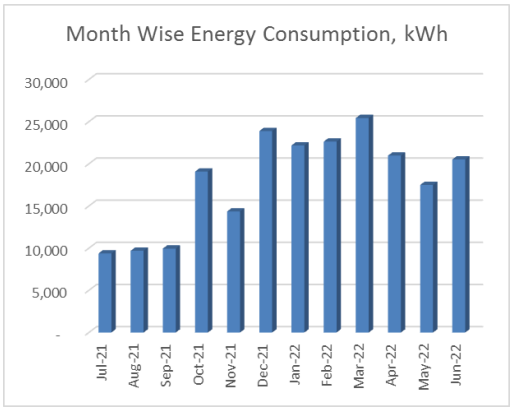


Figure 2.1 : Monthly Electrical Energy Consumption

Key Inference drawn

From the above analysis, we present following important parameters:

Table 2.2: Variation in Important Parameters

No	Parameter/ Value	Energy Consumed, kWh
1	**Maximum**	25,433
2	**Minimum**	9,382
3	**Average**	17,967
4	**Total**	215,609

Study of Environmental Pollution

In this Chapter, we present the various types of Pollution as under:

Air Pollution

The College is using two forms of Energies, namely: Thermal in the form of LPG and Electrical Energy used for day to day operations of the College. The major pollutant on account of above Energy forms is the Carbon Di Oxide.

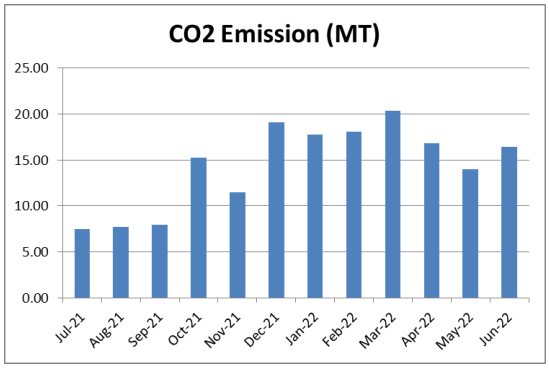
- 1 unit (kWh) of Electrical Energy emits 0.8 Kg of CO_2 in the atmosphere
- 1 Kg of LPG emits 3 Kg of CO_2 in the atmosphere

In the following Table, we present the CO_2 emissions.

Month wise Consumption of Electrical Energy & CO_2 Emissions:

No	Month	Energy Consumed, kWh	CO2 Emissions, MT
1	Jun-24	20,521	16.42
2	May-24	17,499	14.00
3	Apr-24	20,976	16.78
4	Mar-24	25,433	20.35
5	Feb-24	22,635	18.11
6	Jan-24	22,185	17.75
7	Dec-23	23,893	19.11
8	Nov-23	14,360	11.49
9	Oct-23	19,078	15.26
10	Sep-23	9,953	7.96
11	Aug-23	9,694	7.76
12	Jul-23	9,382	7.51
	Total	**215,609**	**172.49**
	Maximum	25,433	20.35
	Minimum	9,382	7.51
	Average	17,967	14.37

In the following Chart we present the CO2 emissions due to usage of Electrical Energy.



CO2 emission due to usage of electrical energy.

Study of waste management

The College hand over the waste to authorized waste collecting agent.

Study of e-Waste Management:

The internal communication is through emails and there is hardly any generation of e-Waste in the premises.

Photograph of waste Management

Promoting Eco Friendly Transport

Promoting the use of electric vehicles (EVs) as a means to avoid pollution is a commendable initiative by Shri Brahamanand Swami Shikshan Prasark Mandal's Arts and Commerce College. Electric vehicles offer several environmental benefits compared to traditional internal combustion engine vehicles, including reduced greenhouse gas emissions and improved air quality

Shri Brahamanand Swami Shikshan Prasark Mandal's Arts and Commerce College promotes the use of bicycles among its students. Encouraging cycling as a mode of transportation offers numerous benefits, both for individuals and the environment

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