

Report on Energy audit of
Dombivli Shikshan Prasarak Mandal's
K.V. Pendharkar College of Arts Science &
Commerce (Autonomous), Dombivli (E)
2023-24

ACKNOWLEDGEMENT

The energy audit of the Dombivli Shikshan Prasarak Mandal's K.V. Pendharkar College of Arts, Commerce, and Science College campus in Dombivli (E) focused on collecting data to evaluate the campus's energy efficiency. The main goal was to find ways to decrease energy usage while enhancing comfort, health, and safety. The audit aimed to identify the most energy-efficient appliances and offer recommendations for optimizing energy usage in everyday activities involving common appliances. The Energy Audit Committee conducted a thorough survey, gathering data from every classroom, laboratory, and room. The survey considered the number of lights, fans, air conditioners, computers, and other appliances in each room, and assessed their impact on overall electricity consumption.

Energy Audit Team

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About the College

The K. V. Pendharkar (Autonomous) college started functioning from June 1979. The college was also given permanent affiliation by the University of Mumbai on 30th August 1980. Right from its inception, the college has been offering quality education to its students, in accordance with the rules laid down by the University of Mumbai, Government of Maharashtra and University Grants Commission. Of late, the institution underwent the third cycle of assessment by the NAAC (National Assessment and Accreditation Council) and is reaccredited with the coveted 'A Grade' (3.14 CGPA) by the council in 2016-17 (2(f), 12(b) of UGC) Today, the college offers Under Graduate, Post Graduate as well as Ph.D. programmes across Art, Commerce and Science streams.

Infrastructure:

- 46 airy & spacious classrooms
- 26 well-ventilated and airy laboratories
- 02 air-conditioned conference halls
- 01 large auditorium
- Separate boy's & girl's common room
- Gymkhana
- Canteen facility
- 01 Colossal Library
- NCC & NSS offices
- Separate Aided & Unaided Offices

OBJECTIVES

The objective of the study is to assess overall efficiency of the various systems and defined specific energy consumption of the academic building and make recommendations about potential energy saving opportunities, based on the observation of energy audit.

Hence the detail objectives are as under,

1. Identify Energy Consumption Patterns
2. Assess Energy Efficiency
3. Reduce Energy Costs
4. Enhance Environmental Sustainability
5. Improve Comfort and Safety

METHODOLOGY

The methodology for conducting the energy audit at Dombivli Shikshan Prasarak Mandal's K.V. Pendharkar (Autonomous) College of Arts, Commerce, and Science involved a systematic approach to gather data and assess energy usage across the campus. The following steps were followed:

Initial Assessment: An initial assessment was conducted to understand the campus layout, building types, and energy consumption patterns.

Data Collection: Comprehensive data collection was carried out, including utility bills, equipment specifications, occupancy schedules, and building layouts.

On-site Inspections: On-site inspections were conducted to visually inspect building systems, equipment, and operational practices.

Equipment Efficiency Analysis: The efficiency of major energy-consuming equipment, such as HVAC systems, lighting fixtures, and appliances, was analyzed through performance testing and evaluation.

Building Envelope Evaluation: The integrity of the building envelope, including insulation levels, windows, and doors, was assessed to identify areas of energy loss.

Occupant Behavior Assessment: An assessment of occupant behavior and operational practices was conducted to understand the impact on energy consumption.

Energy Modeling: Energy modeling software was utilized to simulate energy usage patterns, identify energy-saving opportunities, and evaluate the effectiveness of potential measures.

Recommendations Development: Based on the findings from data collection, inspections, and analysis, recommendations were developed to improve energy efficiency and reduce consumption.

Cost-Benefit Analysis: A cost-benefit analysis was performed to evaluate the financial feasibility of implementing the recommended energy-saving measures.

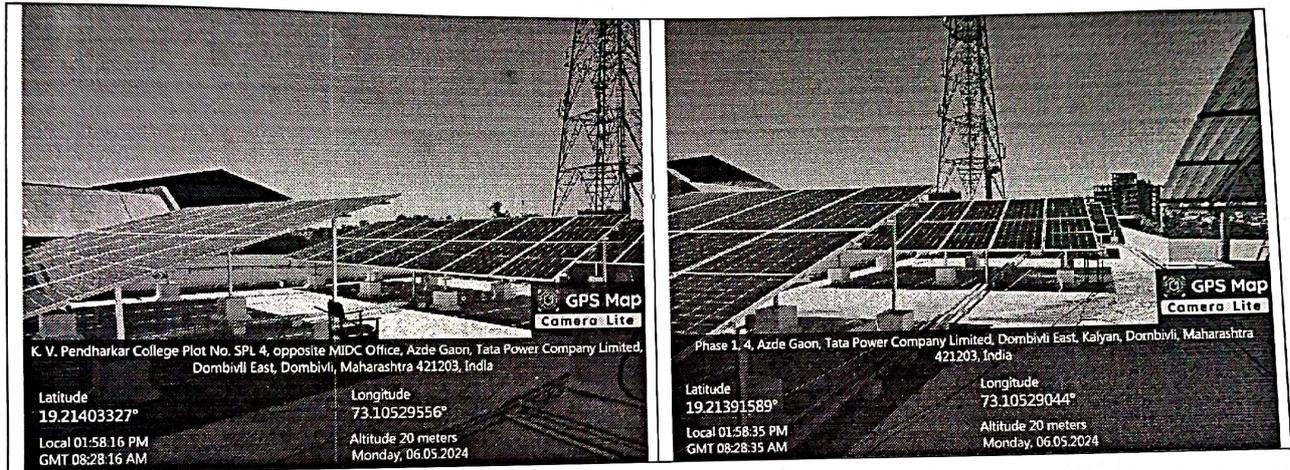
Report Preparation: A comprehensive report was prepared, summarizing the findings, recommendations, and potential energy savings achievable through the implementation of suggested measures.

By following this methodology, a thorough assessment of energy usage on the campus was conducted, leading to the identification of opportunities for reducing energy consumption and improving overall energy efficiency.

System Studied During Energy Audit:

1. Counting Number of Equipment
2. Study of energy utilization requirement.
3. Split air conditioner operation.
4. Energy saving opportunities is identified.

Installation of Solar Panels



Solar panels, or photovoltaic (PV) panels, are crucial tools for energy conservation, converting sunlight directly into electricity using cells predominantly made of silicon. These panels promote renewable energy usage, reducing dependency on fossil fuels and helping mitigate climate change impacts. Solar energy is notably cost-effective over time, due to low operational and maintenance costs after initial setup. The versatility of solar panels allows them to be installed in diverse settings—from residential rooftops to large-scale commercial projects. Enhanced by technological advances that increase efficiency and reduce costs, solar panels have become increasingly accessible, supported globally by policies and incentives that encourage their adoption for sustainable energy solutions.

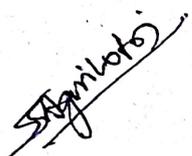
FINDINGS:

Sr. No.	Item Name	Wattage	Total No. of Item	Total Wattage (In Watt)	Daily use (In Hrs.)	Daily power consumption (Watt . Hr)
1	Fans					
2	Tubes (40 Watt)	52	526	27352	8	218816
3	Panel light (small)	20	653	13060	8	104480
4	Panel light (medium)	15	40	600	8	4800
5	Panel light (Big)	22	38	836	8	6688
6	PL Light	36	55	1980	8	15840
7	Air Conditioner (AC)	18	51	918	8	7344
8	Stand Fan (BIG)	1200	45	54000	4	216000
9	Stand Fan (small)	180	11	1980	8	15840
10	Bulbs	58	2	116	8	928
11	Ovens	100	4	400	0.5	200
12	Printers	2000	6	12000	0.5	6000
13	Computers (Desktop)	30	36	1080	0.5	540
14	Server	90	208	18720	4	74880
15	Water Coolers	650	1	650	24	15600
16	Copier	150	6	900	4	3600
17	Xerox Machine	450	2	900	0.5	450
18	ID Printers	250	2	500	0.5	250
19	Projectors	80	2	160	0.5	80
20	Scanners	250	12	3000	0.5	1500
21	Barcode Reader	10	6	60	0.5	30
22	Refrigerators	10	3	30	0.5	15
23	Deep Freez	200	2	400	24	9600
		500	1	500	24	12000
	Daily power consumption (Watt-hr)					715481
	Daily power consumption (Kwatt-hr)			715.481		
	Monthly power consumption (In Kwatt-hr)			21464.43		

CONCLUSION & RECOMMENDATIONS

- Air conditioner shall be operated between temperature range of 23-25°C to maintain lower cooling load on compressor to save energy.
- Energy audit to be carried out by professional agency as many real time observations can be done with sophisticated instruments so that approximation can be reduced and accuracy can be increased.
- Major number of high wattage tube lights are replaced by LED tube lights, panel light etc. so monthly power consumption is dropped due these components
- Awareness and Education: Conduct energy conservation awareness campaigns to educate staff and students about the importance of energy efficiency. Promote energy-saving habits like turning off lights, unplugging chargers, and using natural ventilation when appropriate.
- Recently installation of Solar panel is carried out at roof of college will contribute considerable reduction in power consumption




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