Energy Audit Report, 2024-2025

Morigaon College (Autonomous), Morigaon

Report prepared by:

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Executive Summary

This energy audit report presents a comprehensive analysis of the energy consumption of Morigaon College (Autonomous) for the academic year 2024-2025. The study evaluates electricity usage across different facilities including classrooms, laboratories, canteens, auditorium, offices and other infrastructure.

The objective of this audit were:

- To quantify energy consumption patterns of different electrical appliances.
- To analyze electricity bills in correlation with actual load.
- To identify major areas of energy demand.
- To suggest strategies for energy conservation and cost optimization.

The findings indicate that fans, air conditioners and computers are the largest contributors to energy consumption. Additionally, although solar rebates have provided some relief in electricity expenses, the dependency on electricity remains significant.

Introduction

Morigaon College (Autonomous), established in 1964, is a reputable institution of higher education in Assam. With NAAC accreditation and an 'A' grade, the college prioritizes academic excellence and sustainability. An energy audit is essential to identify areas of energy inefficiency and propose cost-effective solutions.

Data collection and cost

The Energy audit survey was conducted by Energy Audit Committee constructed by Principal, Morigaon College (Autonomous). All data were collected from each classroom, laboratory, canteen, auditorium, indoor stadium, office etc. i.e. from the entire college campus. The work was completed by considering the no. of lights (LED or tubes), fan, AC etc. incorporating its power consumption. In this report we have summarized a comparative analysis of total electrical load available in the college campus and the latest electricity bills.

Energy consumption data

Table 1: Electrical equipment load

Sl. No.	Name of the electrical equipments	Quantity	Average Energy consumption/hr.	Total energy consumption in 8 hrs.
1	CFL Bulb	60	20 W	9.6 KWh
2	LED bulb	130	8 W	8.3 KWh
3	LED tubes	543	20 W	86.8 KWh
4	Tube lights	210	40 W	8.4 KWh
5	Digital Board for classroom	12	120 W	11.5 KWh
6	Fan	624	80 W	399.3 KWh
7	Exhausted Fan	13	65 W	74.3 KWh
8	Computers	145	70 W	81.2 KWh
9	Printers	27	80 W	17.2 KWh
10	LCD notice board	3	60 W	1.4 KWh
11	CCTV	30	50 W	1.5 KWh
12	TV	1	60 W	0.4 KWh
13	Xerox Machines	4	200 W	6.4 KWh
14	Projector	30	100 W	24 KWh
15	Fridge	10	500 W	40 KWh
16	Water purifier	6	25 W	1.2 KWh
17	Electrical motors	02 nos. 0.5 HP, 4 nos. 1 HP, 1 no. 1.5 HP	-	38.7 KWh
18	AC	15	1500 W	180 KWh

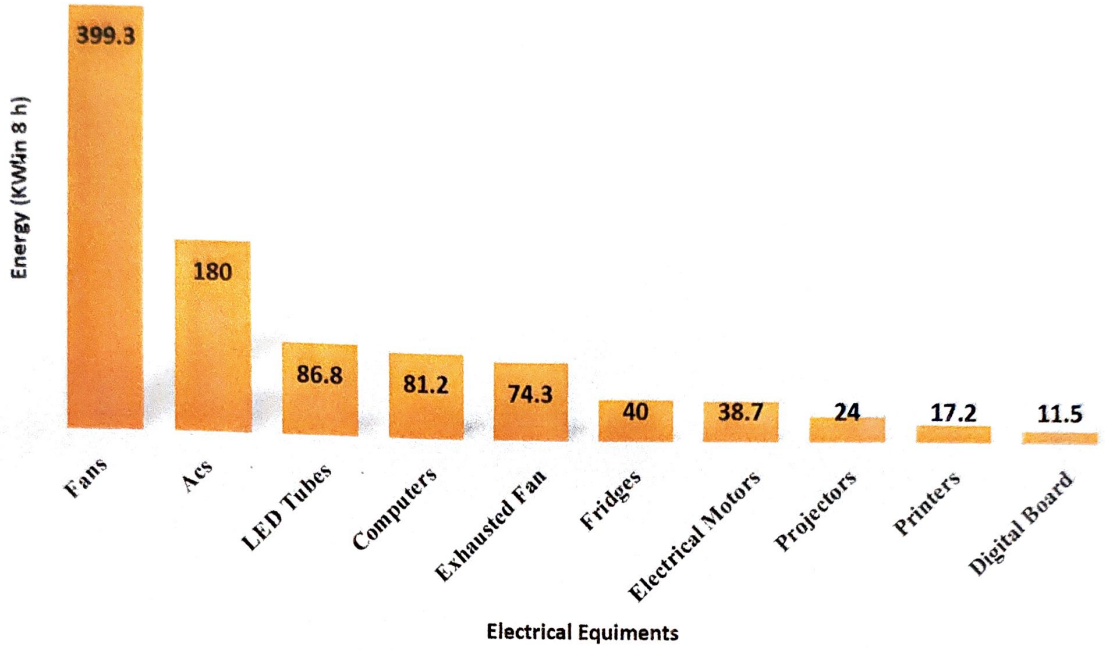

Fig 1: Top 10 electrical Equipments by Energy consumption (8 h)

Table 2: Electricity bill analysis

Sl. no	Billing month	Consumption unit (KWh)	Electricity bill (in Rs)	Solar energy (Rebate in Rs.)	Net electricity bill after solar rebate (in Rs.)
1	July, 2024	2481	36800	3293	33507
2	August, 2024	12163	120319	255	120064
3`	September, 2024	7912	82241	0	82241
4	October, 2024	14,252	140057	0	##
5	November, 2024	5275	60948	1407	199598
6	December, 2024	3048	39533	1806	37727

7	January, 2025	2316	33619	11114	22505
8	February, 2025	2700	35241	0	35241
9	March, 2025	3989	47875	0	47875
10	April, 2025	5383	59127	0	**
11	May, 2025	7984	82,062	0	141189
12	June, 2025	8973	89288	47	89241

##: The bill for the month of October, 2024 was adjusted with the month of November, 2024
**: The bill for the month of April, 2025 was adjusted with the month of May, 2025

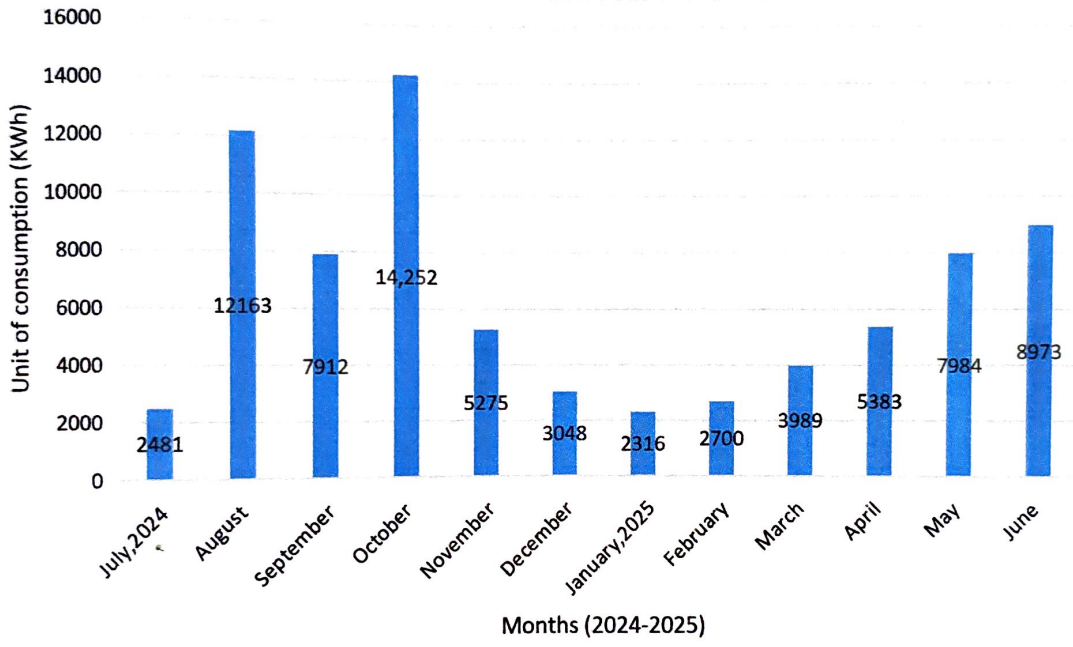

Fig 2: Month wise electricity consumption

Key Findings:

1. ***Lighting:*** Around 210 tube lights are still traditional fluorescent, which consume more power compared to LED.

2. ***Fans:*** with 624 units, fans are the single largest contributor to daily load

3. ***Air Conditioning:*** ACs, though fewer in number, consume disproportionately high energy demand.

4. ***Billing record:*** A sharp increase in bills during August and October indicates seasonal dependence and high consumption.

Recommendations:

Based on the findings of the energy audit, it is recommended that immediate attention be given to optimizing the lighting system within the college campus. The existing CFL bulbs and traditional tube lights should be gradually phased out and replaced by LED alternatives, which are more energy-efficient and cost-effective in the long run. It is further advised that motion-sensor based lighting systems be installed in corridors, washrooms, and other areas of limited occupancy so that unnecessary energy consumption can be minimized.

The use of electrical fans and air conditioners, which together account for a significant proportion of the total load, should be carefully monitored and controlled. The operation of air conditioners should be regulated with the help of automatic timers, and their temperature settings should be standardized between 24°C and 26°C so that excessive electricity consumption can be avoided.

The use of computers, printers, and other ICT equipment should also be brought under stricter energy management practices. It is recommended that the power-saving features of such devices be enabled and awareness be created among students and faculty to ensure that systems are shut down after use. The printing load may also be reduced by encouraging the practice of digital communication and record keeping wherever feasible.

The role of renewable energy should be expanded further in the college. While solar energy has already been introduced to a limited extent, greater investment in solar panels is suggested so that a substantial portion of the daily electricity demand can be met through clean energy sources. More solar-based outdoor lighting may also be installed to demonstrate the institution's commitment to sustainability.

Lastly, it is advised that regular awareness programmes on energy conservation be conducted among students, faculty, and staff so that energy-efficient practices become part of the institutional culture. The establishment of an Energy Management Cell within the college is also recommended so that systematic monitoring of energy use can be undertaken and corrective measures can be applied whenever inefficiencies are identified. Through the consistent implementation of these recommendations, significant cost savings can be realized and the institution's environmental footprint can be considerably reduced.

Conclusion:

The energy audit reveals that Morigaon College (Autonomous) consumes a considerable amount of electricity, with fans, ACs, and computer labs being the major consumers. While some progress has been made with solar rebates, a structured approach to energy conservation and renewable energy integration can lead to significant savings.

By implementing the above recommendations, the college can potentially reduce its annual energy expenditure by **20–25%**, while also contributing to environmental sustainability and aligning with national energy conservation goals.

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Morigaon College (Auto.)
Dt.....
Estd. 1964

NAAC Accredited 'A' Grade with 3.25 CGPA (4th Cycle)

INTERNAL QUALITY ASSURANCE CELL

Permanently Affiliated to Gauhati University

Recognized by UGC under Section 2(F) and 12(B) of UGC Act, 1956

MORIGAON COLLEGE

Morigaon Assam

ESTD: 1964

P.O. & Dist. Morigaon, PIN 782105 (Assam)

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From:
Dr. Lila Kanta Barthakur, M.Sc. Ph.D
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Coordinator
Ph No: 9854152640

Memo No: MC/IQAC/2025/210

Date: 02/05/2025

N O T I C E

This is for information to all concerned that an Energy Audit Committee is constituted with the following faculty members to conduct an energy audit incorporating components of evaluation, testing, energy efficiency, energy consumption and production of the college. You are requested to submit the study report to the undersigned on or before 10th June 2025. Therefore, all are requested to extend cooperation in this regard.

Sl.No.	Name	Designation	Contact No.
01	Dr. Hemanga Jyoti Sarmah	Convener	6900743729
02	Ms. Upashana Gogoi	Member	7002407672
03	Mr. Kashyap Das	Member	6000808446
04	Ms. Harshita Hazarika	Member	8472826987

02/05/25

(Dr. Lila Kanta Barthakur)
Principal
Morigaon College

PRINCIPAL
MORIGAON COLLEGE
DATE:.....

(Dr. Ajit Konwar)
Coordinator
IQAC, Morigaon College

Coordinator
IQAC
Morigaon College
Date ..02/05/2025