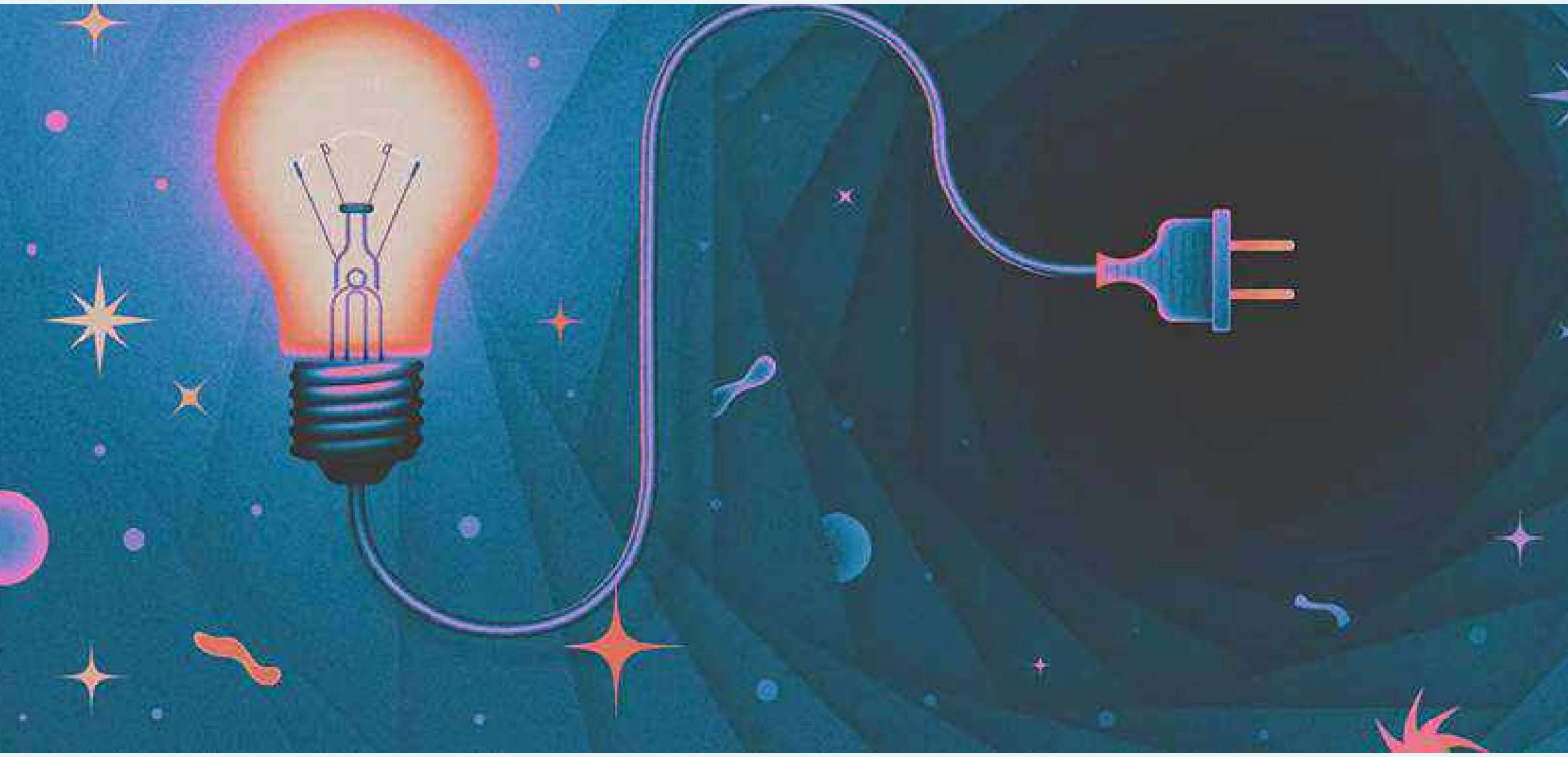
ENERGY AUDIT REPORT



2022-2023

ENERGY AUDIT CELL
SARUPATHAR COLLEGE

SARUPATHAR COLLEGE

ENERGY AUDIT CELL

Sl. No	Name	Designation	Role
1	Dr. Prapti Thakur	Principal Sarupathar College	Chairman
2	Mr. Pranjal Dutta	Assistant Professor	Co-ordinator
3	Mr. Atul Saikia	Assistant Professor	Member
4	Mr. Satyabrat Dutta	Assistant Professor	Member
5	Mr. Bipul Das	Assistant Professor	Member
6	Mr. Krishna Konwar	Assistant Professor	Member

1. Dr. Prapti Thakur Prapti Thakur
2. Mr. Pranjal Dutta Pranjal Dutta
3. Mr. Atul Saikia Atul Saikia
4. Mr.SatyabratDutta Satyabrat Dutta
5. Mr. Bipul Das Bipul Das
6. Mr. Krishna Konwar Krishna Konwar

Assam Power Distribution Company Ltd.

Regd. Office: BijuleeBhawan, Paltan Bazar, Guwahati-781001, Assam
CIN: U40109AS2003SGC007242, Website: www.apdcl.gov.in

OFFICE OF THE SUB DIVISIONAL ENGINEER
Sarupathar Electrical Sub-Division
APDCL, Sarupathar
Email: dmesd_apdcl@rediffmail.com

No: APDCL/SESD/SDE/2022-23/2318 Date: 25.05.2023

TO WHOM IT MAY CONCERN

This is to certify that Sarupathar College, Sarupathar has conducted detailed Energy Audit in the college campus for the session 2022-2023 with an aim to take stock of various electrical power consuming devices including lighting system, fan and various blocks in the college campus and thereby to reduce the energy intensity in the college.

I sincerely appreciate the initiatives taken by the college authority to reduce the energy intensity in the college campus.

Date: 25/5/23

Place: Sarupathar

Sub-divisional Officer
Sarupathar Electrical Sub-division
APDCL, Sarupathar

Sub Divn Engineer
Sarupathar Electrical Sub Divn.
APDCL, Sarupathar

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INTRODUCTION

Energy is a basic requirement for economic development in almost all major sectors of Indian economy i.e., agriculture, industry, transport, commercial, residential (domestic) and educational institutions. Consequently, consumption of energy in different forms has been steadily rising all over the country, which has maintained a steady growth pattern in the past and the trend is likely to continue in future as well. This has increased the dependence of the state on fossil fuels and electricity. The Government of India enacted the Energy Conservation Act, 2001 in October 2001. The Energy Conservation Act, 2001 became effective from 1st March, 2002. The Act provides for institutionalizing and strengthening delivery mechanism for energy efficiency programs in the country and provides a framework for the much-needed coordination between various Government entities. Sarupathar College, Sarupathar an educational institute in Golaghat district of Assam taking voluntary objective of reducing energy intensity in the College Campus for conducting Energy Audit. To conduct the energy audit, the audit team visited the campus on 25th of February 2022 to collect data and to take some measurement for assessment of different energy consuming components.

Sarupathar College, Sarupathar, an educational institute in Golaghat district of Assam has taken voluntary objective of reducing energy intensity in the College Campus for conducting energy audit. The idea of energy audit is a collective effort. . It is essential that an energy audit cell is formed to carry forward the objective of energy audit . With an aim to smoothly conduct the energy audit in the college campus, the “Energy Audit Cell (EAC)” was formed with the Principal as Chairman along with other five members including the Co-ordinator. To conduct the energy audit, the audit team visited the campus on to collect data and to take some measurement for assessment of different energy consuming components.

The methodology for energy audit consists of preliminary audit, pre- audit and post audit stages. After formation of EAC members along with energy auditor goes round the entire campus to take stock of various electrical power consuming devices including lighting system, fan and various blocks in the college campus. The activities of the EAC include : assessment of actual operating load and scope for optimizing , review of existing electrical load in the campus , review of electrical load based on actual requirement, study of individual units and means to conserve electrical power, study of existing use of power, review of unit wise electrical load based on requirement, recommendation for saving electricity, energy conservation in Air-conditioning and water pumping system, observation in use of power and water , methods to save power and water, Diesel Generator (DG) SET, existing standard of operation and performance of DG set in terms of specific fuel consumption. Data collection was done in the sectors such as sources of energy and energy consumption pattern. College records and documents were verified to clarify the data received through survey and discussions. Site inspection was done along with staff. Questionaries were answered during the site tour.Documents such as electricity bills, fuel consumptions were collected and reviewed.

ENERGY SCENARIO OF SARUPATHAR COLLEGE

The total energy consumption and electricity bill paid during the financial year 2022 - 2023 has shown below.

SL. NO	Data on power supply	Value
1	Connected Load	45KW
1.1	Contracted Demand	53kva
2	Installed capacity of DG set	25Kva (1No) Make: Kirloskar Oil Engine Limited, Engine SL No.:47.3027/1101665 10Kva (1 No) Make: Kirloskar Electric Engine No:04.2009/0500671
3	Annual electricity consumption (June 2021 to May 2022)	24450.3kwh
4	Annual cost of electricity consumption.	Rs.362854.00
5	Annual cost of electricity consumption through DG set	Rs.62175.00
6	Total cost of electricity (utility + DG set)	Rs.425029.00
7	Total numbers of building covered	14
8	Working hours (Academic and Administration building)	8 Hrs (9 AM to 5 PM)
9	Working hours (Hostel building)	24 Hr x7 days
10	Working Days/ Week	6 Days
11	Whether sub-metering of electricity consumption for each building	No

Key Findings and Observations of Energy Usage

The base of energy audit is that its findings are supported by documents and verifiable information. The audit process seeks, on a sampled basis, to track past actions, activities, events and procedures to ensure that they are carried out according to system requirements and in the correct manner. The essence of any energy audit is to find out how well energy management equipment is performing. Each of the components are crucial in ensuring that the organization's energy performance meets the goals set in its energy policy.

PRESENT ENERGY SCENARIO

At present the overall energy consumption is catered by the electricity supply from Assam Power Distribution Company Limited and own DG sets. Total Connected load of Sarupathar college is 45 KW and Contracted Demand is 53KVA. There are ten (10) Solar photovoltaic

street light (60 watt) and total 2 numbers of DG sets (25kVA, 10kVA) are used to supply power during load shading hours.

EXPERIMENT AND DATA COLLECTION

All required data is collected by committee of Sarupathar College. In building, in every room, how much fans, tubes, light, computer, instrument AC, etc. are there, is measured. According to survey following data is collected.

Table 1. Total power requirement of various departments

Department/Room	Ceiling Fan	LED Light	Tube Light	AC	Computer	Printer	Xerox machine	Projector	CC Camera	LED HALOGEN LIGHT
Principal room	2		3	1	1	1			1	
Vice -Principal room	2		2						1	
Administrative building 1	5	1	4		4		1		1	
Administrative building 2	4	3	3			1	1		1	
Computer room	4	4			10				1	
Exam cell	2		2						1	
Library	15	14	1		6	1	1		3	
Class room 23 to29	28	16						7	7	
Class room 5 to 12	36	20	13					7	8	
Class room 21,22	18	6	6						2	
Class room 13,14	10	4	4					2	2	
Class room 31,32,33	20	4							3	
Conference room	8	7	2	2				1	2	
Boys common room	1	1							1	
Departmental Staff room 8 Nos. (Arts)	16	16	2		7	7				
Departmental stuff room (Commerce)	6	4								
IQAC room	4		3		3			1	1	
Canteen	5	10								
Boys hostel	9	15								
Girl's hostel	54	100	2						5	
Warden girls' hostel	2	6								

Girls common room	1	1	1							
Digital class room 7 Nos.	28	2	28		1					
Pavilion	5	20								
Auditorium	31	81	13						4	
Teachers' urinal M/F		4								
Canteen boy's hostel	4	5								
Canteen girl's hostel	4	4	2							
Bhupen Hazarika study center	2	2							1	
Guest house	10	7		4					1	
Outside class room									25	
Outside class room										10
Outside class room			15							
OUTSIDE CLASS ROOM		17								

Average monthly power consumption in 2022-2023

SL NO.	Month	Consumption in kwh
1	June	2968.740
2	July	3154.930
3	August	2032.680
4	September	3284.840
5	October	2543.490
6	November	1702.070
7	December	1231.490
8	January	1244.670
9	February	1843.150
10	March	1850.200
11	April	2594.040
12	May	
Total		24450.3 kwh

Monthly Electricity bill paid in 2022-2023.

SL NO.	Month	Bill In Rupees
1	June	69177.00
2	July	36693.00
3	August	28390.00

4	September	38947.00
5	October	32289.00
6	November	25734.00
7	December	22048.00
8	January	22029.00
9	February	26069.00
10	March	27880.00
11	April	33589.00
12	May	
Total		362845.00

WATER PUMPING SYSTEM:

The campus has total six (6) numbers of water pumps in working condition. Detail specification along with installed location are given below-

SL No.	Location	Capacity	Quantity	Type	Make/Model
1	Boys Hostel	1 hp	1	surface	LUBI SL No. 2002404
2	Girls Hostel	1hp	1	submersible	CROMPTON Model: 3W12AK1A THP
3	Garden	1hp	1	surface	POLYCAB MODEL: GALAXY
4	Wash room	1hp	1	surface	SILVER MODEL: SKY100X
5	Central	1hp	1	submersible	KSB
6	Pavilion	0.5hp	1	surface	CROMPTION MODEL: MINI CHAMP PLUS II

Recommendations for better Energy Efficiency

Based on the analysis of the power consumption data, certain steps have been recommended for improving energy efficiency of this campus. Also, a number of general measures for energy efficiency have been listed.

Low Cost / No investment

Housekeeping

- The windows should be cleaned so that ample sunlight can enter classes and the usage of daylight can be maximised.

- The ceiling fans should be cleaned.

- The switches of Ceiling fans and lights in the classrooms should be properly grouped so as to switch off the unwanted lights instead of operating all the tube lights and ceiling fans

- Energy awareness camps to be conducted twice in a year in the campus to impart energy conservation knowledge to the students.

Training & Awareness

Maintenance & operating staff should be trained / informed about the energy management issues & procedures. To implement an effective preventive maintenance program, the operational staff must be given comprehensive training on each type of equipment, regarding system fundamentals, use of reference material & manuals, maintenance procedures, service guidelines & warranty information. Proper maintenance schedules could be supplied to them for different equipment.

Other Savings

New computers available in the market offer built in power saving modes. These monitors are called as Energy Star compliant monitors. However, it was found that most of the users are not aware of this facility. Therefore, steps should be taken to inform every one of this & any such future options. Switches for computers should be made more accessible, so that employee can turn off their terminals when not in use.

Medium Investment / Short term replacements

Use of master switch outside each Room: Installation of master switch outside a room can make it easy for a person to switch off all the appliances of a room in case if someone forgets to switch off while leaving the room. This can help improving energy efficiency.

High Investment / Long term replacements

Replacement of Overhead Electrical power supply line to Underground line. As the overhead line is passing through the areas where tree touching is common issue. Due to frequent faults in the overhead line, there are frequent power outages due to which the Diesel Generator is started frequently to maintain power supply in the campus. After changing the overhead line with underground cable, the reliability of power supply is maintained and the diesel engine usage can be minimised thereby improving the overall energy efficiency and saving of additional fuel cost.

PHOTOGRAPHS

SOLAR STREET LIGHT

TRANSFORMER PROVIDED BY ASSAM POWER DISTRIBUTION LIMITED(APDCL)

DG SET


GPS Map Camera
Dhansiripar, Assam, India
6V6C+PMG, Dhansiripar, Assam 785601, India
Lat 26.212049°
Long 93.871312°
13/05/22 11:10 AM GMT +05:30
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