To,

The Principal

North Kamrup College, Baghmara

Sub.: Energy Audit Report

Dear Sir,

After completing the study on the electrical infrastructure of the college on 24th May, 2023 the collected data has been analysed and presented in the enclosed report. The report emphasises in recommendation to increase productivity, save energy, improve power quality and reduce failure thereby enhancing your plants 3Ps: Power, Productivity & Profitability.

An earnest effort has been made to portray you the existing scenario with potential for improvement. Ibelieve that you shall find myobservations & recommendations useful and make a sincere effort to implement the proposed schemes and derive the projected benefits.

I take this opportunity to express my gratitude and thanks to the authority and management for keeping faith on my ability and taking a positive approach.

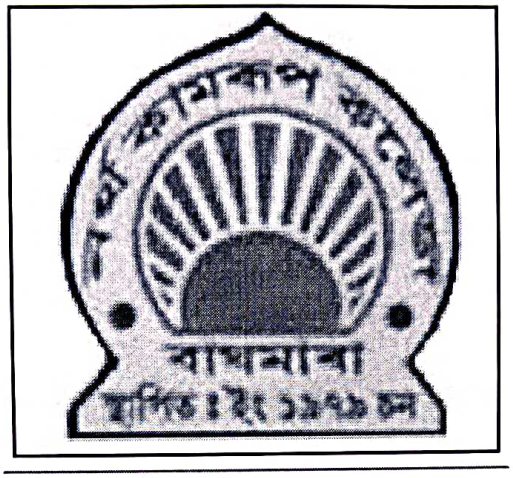
Regards

(Apurba Talukdar)

Asstt. Professor
Dept. of Physics
Bhattadev University
Barpeta, Assam

Assistant Professor
Dept. of Physicss
Bhattadev University

ENERGY AUDIT REPORT



North Kamrup College

Baghmara, Barpeta, Assam

PIN: 781328

Submitted to the **Principal, North Kamrup College, Baghmara**

By

Apurba Talukdar
Asstt. Professor
Dept. of Physics
Bhattadev University

Introduction

An energy audit is a survey in which the study of energy flows for the purpose of conservation is examined at an organization.Energy Audit will help to understand more about the ways energyare used in any institution and help in identifying the areas where waste can occur and where scope for improvement exists. The Energy Audit would give a positive orientation to the energy cost reduction, preventive maintenance and quality control programmes which are vital for production and utility activities. Such an audit programme will help to keep focus on variations which occur in the energy costs, availability and reliability of supply of energy, decide on appropriate energy mix, identify energy conservation technologies, retrofit for energy conservation equipment etc.

Aims and Objectives of an Energy Audit

The aim of an energy audit is to identify the energy efficiency, conservation and savings opportunities at the premises of the audit sites in a systematic manner. The audit process is carried out as per the following.

- Review of energy saving opportunities and measures implemented in the audit sites.
- Identification of additional various energy conservation measures and saving opportunities.
- Implementation of alternative energy resources for energy saving opportunities and decision making in the field of energy management.
- Providing a technical information on how to build an energy balance as well as guidance to be sought for particular applications.
- Detailed analysis on the calculation of energy consumption, analysis of latest electricity bill of the campus, understanding the tariff plan provided by the central and State Electricity Board. • List ways that the use of energy in terms of electricity, electric stove, kettle, microwave, LPG, firewood, Petrol, diesel and others.

Systems studied during the Energy Audit

- Physical verification of lighting, fans load fixtures and electrical wirings.
- Verification of installed energy efficient systems.
- Inspection of Solar panel, Generators, Uninterrupted power supply machines.
- Analyse the electricity consumption through the supply distribution company (APDCL).
- Review the potential usage of alternative energy resources.

Systems Studied during the Energy Audit

1. Lighting fixtures were verified physically.
2. Installation of energy efficient lighting systems were verified.
3. Installation of safety systems were verified
4. Installation of power backup systems (generators and UPS) were verified on the aspect of maintenance and consumption.

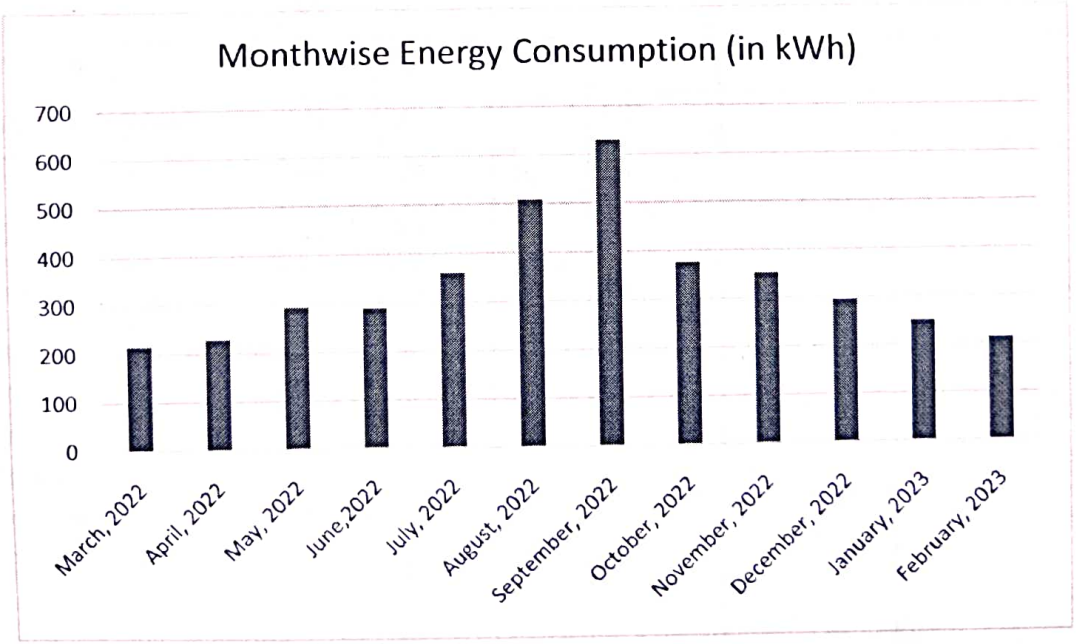
5. Electricity consumption through the APDCL bills was analysed.

6. The energy conservation awareness among the stakeholders for optimum use of electricity and its savings were reviewed.

Energy Consumption and Cost Profile

The following table and chart shows the profile of energy consumed and the cost for one year by the institution.

Month	Energy Consumed (in kWh)	Cost (in Rs.)
March, 2022	216	2379
April, 2022	229	2826
May, 2022	293	2826
June,2022	289	2771
July, 2022	360	3276
August, 2022	509	4456
September, 2022	630	5101
October, 2022	376	3462
November, 2022	352	3320
December, 2022	295	2886
January, 2023	250	2674
February, 2023	213	2322



Power supply Equipment and Major Loads

Load contracted: 10 kW

Table 1. Major Equipment related to Electrical energy utilization

Consumers Room Description	Fan	LED	CFL	Socket	Computer	Printer/ Scanner
Principal Office						
Conference Room	04	04	02	02		
Main Office	04	04				02
Computer Lab	02	02	02	10		
Examination Cell	01	04	1	04	01	01
IQAC Room	04	04		05	02	02
Auditorium						
Assamese	02	03		01		
Bodo	01	02		01		
Economics	02	02		01		
Education	03	03		02		
English	01	01		01		
History	01	01		01		
Philosophy	01	01		01		
Political Science	01	01		02		
	09	12	10	04		
Class Room	41	10	24			
Digital Classroom	04	04		04		
Boys' Common Room	02	02		01		
Girls' Common Room	02	02		01		
Canteen	01	01		01		
Sick Room	01	02				
Toilet		09				
Dining Room	02	02		02		
Kitchen		02		02		
Corridor		07				
Gymnasium	01		02	01		

Other Electrical equipments:

1. Three water pumps (0.5 HP, 0.5 HP & 1 HP)
2. One water cooler
3. Three inverters with 12V batteries

Analysis of Electrical Distribution System:

Sl. No.	PARTICULARS	OBSERVATION	REMARKS
1	Is distribution of load satisfactory	YES	
2	Condition of electrical wiring	GOOD	
3	Type of wiring	Open	
4	Whether electrical equipment's are operating at specified voltage or current (with in the tolerance range)	YES	
5	Rating of fuses/junction box are as per standards	YES	
6	Whether single isolating switch is available for the whole premises	YES	
7	Earth pits identified	YES	Needs to be improved
8	Conduction of earthing	Fair	Needs to be improved
9	Earth connection to equipment's – proper/ not proper	Proper	Needs to be improved
11	Weather DG is provided with neutral earthing	YES	
12	Cable laying condition	GOOD	
13	Cable Terminations	Proper	
14	Meter and main condition	GOOD	
15	Panel Board Condition	GOOD	
16	Solar Panel	Connected	

17	LED Lights & Energy Saving Appliances	Fair	Needs to replace all the CFL Lights by LED Lights
18	Rating of cables as per standard	YES	
19	Generator Capacity & Condition	60KVA - GOOD	
20	Average energy produced by Solar		

Recommendations for improving the energy efficiency and energy conservation

- The ratio of load utilised to load contracted is found quite higher than the recommended value (<0.85). It is suggested to increase the load contracted. The load utilised may be reduced by removing the unnecessary sockets installed.
- All the CFL bulbs should be replaced with LED bulbs. Procurement of equipment with energy efficiency (4-5 star rated equipment) during replacement may be considered.
- Sub meters in all the buildings for energy monitoring is recommended so that energy load required and energy consumption in each building may be noted.
- More solar lights and panels may be installed.
- Optimal water usage will reduce the energy consumption.
- Turn off electrical equipment when not in use.

Conclusions

Considering the fact that the institute is a well-established, long time run establishment with good reputation, there is significant scope for conserving energy and make the campus as self-sustained in it. The energy conservation initiatives taken up by the institution are substantial. Energy efficient lighting schemes, awareness created among stakeholders and necessary power backups are being practiced by the institution.

Acknowledgement

I am grateful to the Management, the Principal and the IQAC of North Kamrup College,Baghmara, Assam, for providing necessary facilities and co-operation during the energy audit process. This helped me in making the audit a success. Further, I hope that the best practices on sustainability followed by the Institution will boost the new generations to take care of the Electrical energy conservation, Energy saving measures and sustainability incompliance with the applicable regulations, policies and standards in North Kamrup College Campus.

(Apurba Talukdar)
Asstt. Prof., Dept. of Physics
Bhattadev University, Barpeta

Assistant Professor
Dept. of Physics
Bhattadev University