



GOVT.PATALESHWAR COLLEGE MASTURI

ENERGY AUDIT REPORET



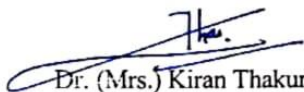
SESSION 2020-21


NAAC ACCREDITATED GRADE "B"


AFFILIATED TO ATAL BIHARI UNIVERSITY, BILASPUR (C.G)

Energy Audit Certificate

This is to certify that an "Energy Audit" for government Pataleshwar College, Masturi Distt. - Bilaspur (C. G.) has been conducted for session 2020-21 to assess energy cost, availability and reliability of supply of energy conservation technologies and reduce energy consumption.


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Preface

An energy audit is a systematic review of the energy consuming installations in a building or premises to ensure that energy is being used sensibly and efficiently. An energy audit determines the amount of energy consumption affiliated with a building and the potential savings associated with that energy consumption. Additionally, an energy audit is designed to understand the specific conditions that are impacting the performance and comfort in the available facility to maximize the overall impact of energy-focused building improvements. Data collection for energy audit of the Govt. Pataleshwar College, Masturi, Bilaspur (C. G.) campus was conceded by team for the period of June 2020 to May 2021. This audit was over sighted to inquire about convenience to progress the energy competence of the campus. This audit required to recognize the mainly energy proficient appliances. Besides several each day processes concerning common appliances have been enprovided which facilitate sinking the energy expenditure. Through implementation of the suggested improvement measures, the college can get the immediate benefit for paying less for energy bills. On the other hand, lowering of energy consumption in buildings will lead to the chain effect that less fossil fuel will be burnt for electricity generation by the power supply companies and relatively less pollutants and greenhouse gases will be introduced into the atmosphere, thus contributing to conserve the environment and to enhance sustainable development.

Acknowledgement

The energy audit committee, Govt.Pataleshwar College Masturi, Bilaspur (C. G.) is very much thankful to Principal **Dr. D.R. Sahu** and IQAC coordinator Dr. (Mrs.) Kiran Thakur for entrusting and offering the opportunity of energy performance assessment assignment. Committee is also thankful to **Jitesh Divya, Assistant Engineer, CSPDCL, Masturi, Bilaspur (C. G.)** for guidance and support. At last we express our sincere thanks to all concerned staff interacted during the conduct of this exercise for completing official documentations.

Energy Audit Report of Government Pataleshwar College Masturi , Bilaspur (C. G.)

Introduction

Government Pataleshwar College is situated at Kosamdih Road, Masturi in Bilaspur District Chhattisgarh state. This college is affiliated with Atal Bihari Vajpayee University, Bilaspur (C. G.). This college is established in 1988 which has been imparting higher education at UG level in science, Commerce & Art faculty and PG level at arts. The College campus consists of buildings named as Old Building and Administrative Building in which administrative office, Library, exam control room, staff rooms, classrooms, various laboratory like Physics, chemistry, botany, zoology as well as computer laboratories, faculty departments are functioning. This college also provides gym facility to student undergoing through various type of physical activity.

Objective of Audit

This is a challenge for every organization to ensure that energy growth in premises and buildings does not become unmanageable, but also gives and presents an opportunity to influence and identifies energy management issues. As the natural resources are limited and energy uses are increasing very sharply so it is very necessary to save natural resources by reducing energy consumption which can be achieved by using energy efficient equipment's and also by awareness of people about energy conservation. The overall objective of the assignment is to quantify energy saving in existing system and achieve reduction in energy consumption pattern. Hence the detail objectives are as under,

- To carry out the energy consumption
- To evaluate the performance of the equipment
- To find out the energy saving opportunities
- To quantify the total energy savings
- To find out the ways to achieve energy efficiency

Methodology:

Data collection for energy audit of the Govt. Pataleshwar College, Masturi, Bilaspur (C. G.) campus was conceded by team for the period of June 2020 to May 2021. The audit involves visiting physical position of load & carry out inventory of various electrical load. Energy bill received from CSDCL is audited & studied for KWH requirement & how efficiently energy is used. Various positions are interacted, familiarized with energy audit & involved for successful & result oriented energy audit. Energy conservation & saving opportunities are identified during round & measurement for implementation.

(i) **Inventory of various electrical load in the campus**

All required Data is collected by Department of Mathematics. Data for various lighting/ electrical fixtures, connected with 01 meter in Main and Old building was collected and verified by the committee members. According to survey following data are collected:

Table 1: List of Electrical Equipment in the Campus

Department / Instr	Fan	LED Bulbs	LED Tubelight	CFL Tubelight	A.C	Fridge	Computer	Printer	Projector	Television	Water pump Motor	Water Cooler	Cooler
ADMINISTRATIVE BLOCK													
Principal Office	03	1	03		01	01				01			
Physics Lab	04	1	04				01	01	03				01
Zoology Lab	06		02			01	01	01	01				01
Botany Lab	04		04				01	01	-				01
Chemistry Lab	04		04			01	02	01	-				01
Office	04	1	03				01	01					01
Examination Cell	03		04										01
Corridor		1	06									02	
N C C	02		02										
Store room			02										
Mathematics Department	03		04				01	01					
Sociology Dept.	04		04										
Economic Dept.	04		03										
Computer Lab							13						
Class Room 01	08		06										
Class Room 02	08		06										
N S S	04		04										
Washroom Girl			03										
Washroom boys			03										
Old building													
											01		

Commerce Dept.	01		02										
Class Room 10	01		02										
Class Room 11	02		02										
Class Room 12	01		02										
Political Science Department	04		02										
Hindi Department	01		02										
Class Room 13	02		02										
Geography Dept.	01		02			01	01	01					
Class Room 14	02		03										
Class Room 15	01		02										
Class Room 16	02		02										
Sports department	08		06										
Total	87	04	98		01	03	21	07	05	01	01	02	06

(ii) CSPDCL bills and payment analysis and working out average cost of power

In order to calculate the electrical consumption in various parts of the college campus, electricity consumption and payment recorded in the meter of the college in CSPDCL portal was studied and verified with the bills and vouchers. Since the average unit is considered in monthly bill by taking readings on quarterly basis by the CSPDCL, the annual consumption for the session 2020-21 was used for comparative analysis

**Table 2: Power consumption (in units) in Session 2020-21
(1 Unit= 1 kW-Hr)**

S. No	Month	Consumption Unit (kW-Hr) Old Building	Consumption Unit (kW-Hr) Rusa Building
1	Jun -20	34	440
2	Jul -20	629	200
3	Aug -20	613	1094
4	Sep -20	613	000
5	Oct-20	430	491
6	Nov-20	469	361
7	Dec-20	447	248
8	Jan-21	414	105
9	Feb -21	414	99
10	Mar -21	201	255
11	Apr -21	93	109
12	May -21	299	181
Total Unit		4656	3583
Monthly Average Power Consumption		kW-Hr = 388	298.58

Graphically Representation of Electricity Distribution:-

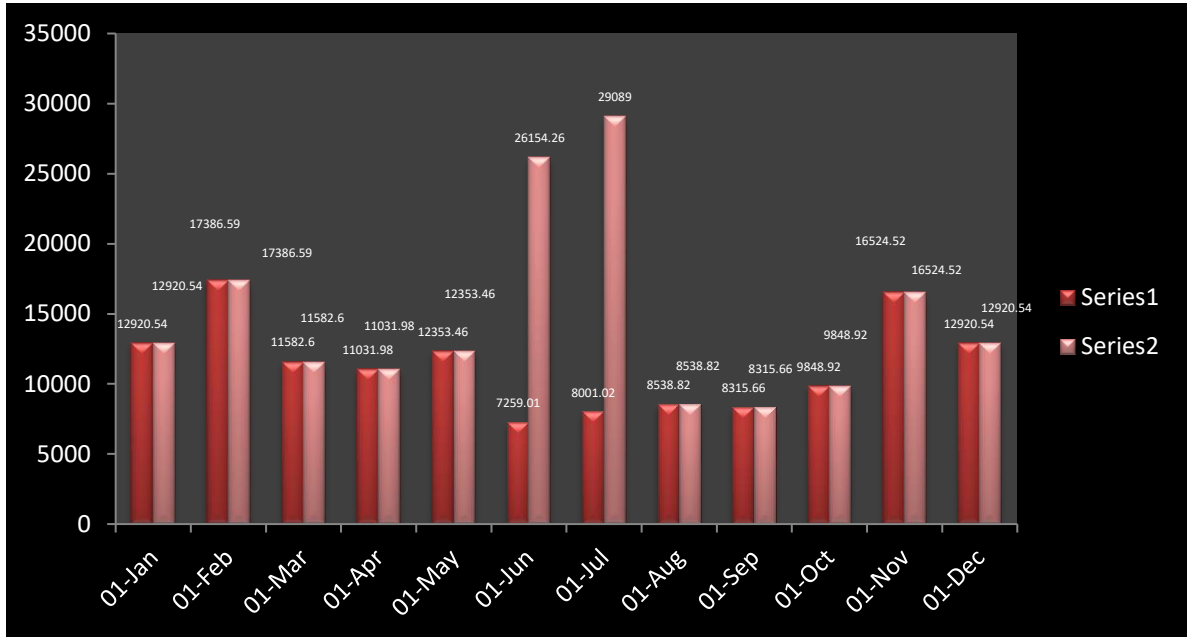
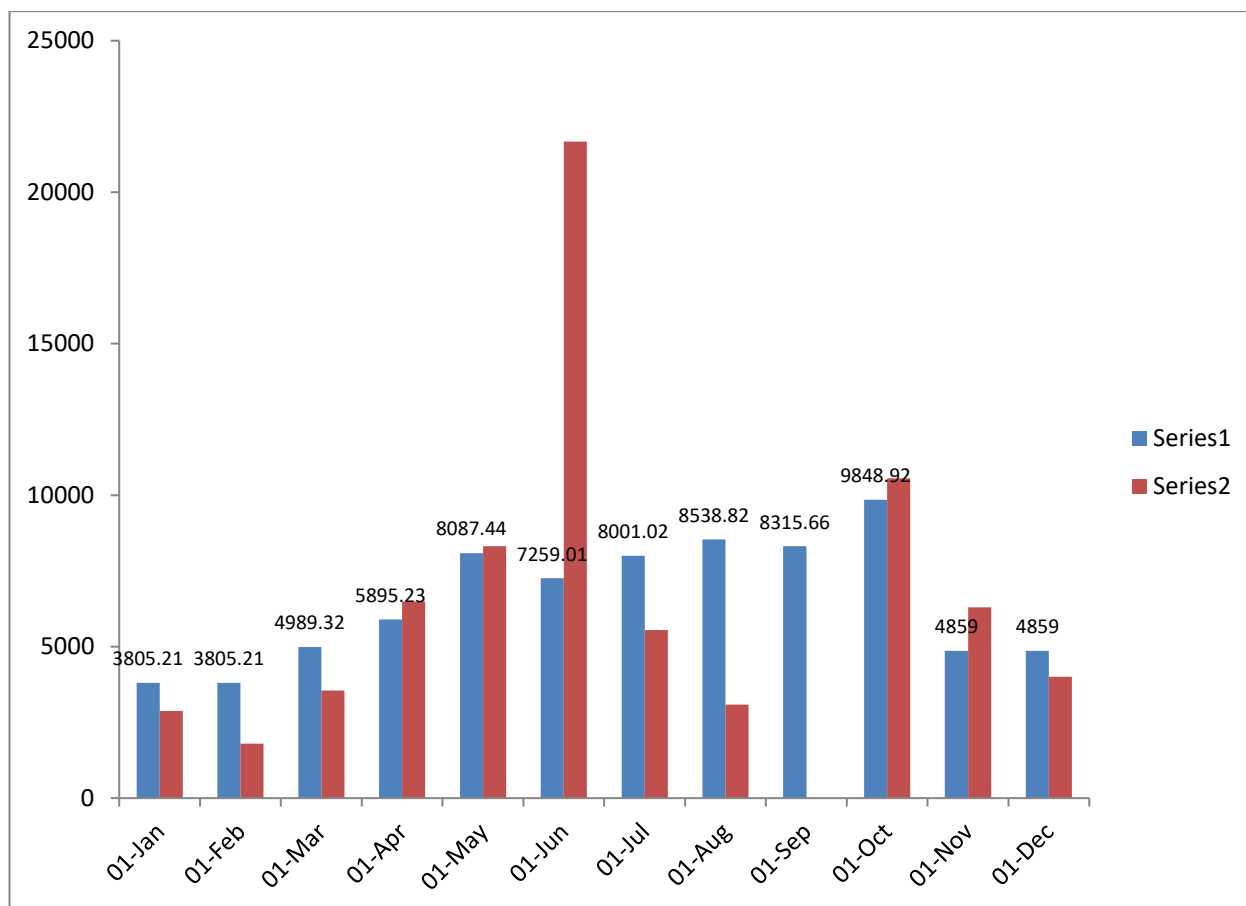


Table 3. Bill served by CSPDCL and paid by the college (Amount in Rs.)

S. No	Month	Consumption Unit (kW-Hr) Total Amount	Consumption Unit (kW-Hr) Rusa Total Amount
1	Jun -20	7259.01	21675.40
2	Jul -20	8001.02	5546.57
3	Aug -20	8538.82	3089.57
4	Sep -20	8315.66	000
5	Oct-20	9848.92	10561.25
6	Nov-20	4859.00	6295.87
7	Dec-20	4859.00	4002.26
8	Jan-21	3805.21	2876.80
9	Feb -21	3805.21	1795.25
10	Mar -21	4989.32	3547.16
11	Apr -21	5895.23	6492.36

12	May -21	8087.44	8320.92
Total (in Rs.)		78255.62	74201.15
Average Monthly Expenditure on Electricity Bill		6521.30	6183.42

Graphically Representation. Bill served by CSPDCL and paid by the college (Amount in Rs.)

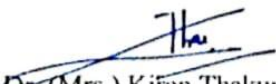


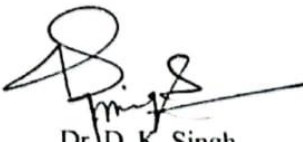
(ii) Observations and Recommendations:


The energy consuming system and load are studied for identifying energy saving and conservation opportunity. data generated in energy audit are useful for to understand the energy distribution and utilization of college. During movement for study the various element in campus in scope of Energy Audit, many improvement potential areas & energy saving opportunities are observed. These are highlighted below with recommendation for action plan & its implementation for enhancing energy efficiency &

cost saving:

1. There is vital scope for energy conservation in lighting & fan system as below. The financial analysis with cost effectiveness study of various options is already given. A) Replacement of conventional fan regulator with electronic regulator. B) Replacement of CFL tube light with LED bulb. C) Replacement of incandescent bulb with CFL. D) Replacement of CRT monitor with LED or LCD monitor.
2. It was found during campus electrical load inventory round many classrooms without occupancy. However Tube light & ceiling fan loads were on wasting costly electrical energy as well as adding unwanted cost to college. It is proposed herewith to stick Awareness cum Warning Sticker to each switch board to take care of this negligence.
3. It is strongly recommended to introduce solar power for electricity generation in the campus. There is lot of useful roof top available in campus for installation of solar panel. This will help to generate green power mitigating greenhouse gas emission for protection of environment as well as energy conservation. This mode of power generation will save energy cost for purchasing power from CSPDCL and overcome dependency on utility power supply. This will also prove demonstrative model for studying student to imbibe technical knowledge.
4. As there is huge surface area for collection of rain water on roof top, the rain water can be collected in storage tank installed at sufficient height to cater for need of various toilet block water during rainy season. This will help to achieve rain water harvesting as well as saving in electricity cost required for pumping water.
5. Electrical wiring has become quite out dated in many places and joints are used. Hence these should be repaired for better energy management.
6. Provision of separate transformer for college is good step to maintain supply reliability.
7. There is still tremendous scope to create awareness among user about efficient & optimum use of energy & water to save. Instruction cum Request Sign board shall be displayed near each switch-board, toilet block & bathrooms to influence & guide to user to arrest misuse & wastage of power & water.


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