



Criteria VII

7.1.3 ENERGY AUDIT REPORT

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Dr. Rafiq Zakaria College for Women
Navkhanda, Aurangabad

Energy Audit Manual

2022-2023

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INDEX



1. Introduction
2. Committee
3. Objective
 - a. To study present level of Energy Consumption
4. Methodology
 - a. Study of connected load
 - b. Study of Electrical energy consumption
 - c. Analysis of connected load in campus other than motive power
 - d. Analysis of connected load of motive power
5. Recommendation
 - a. Identified Energy Saving Opportunity
 - b. Energy Saving from motion sensor proposal
 - c. Energy saving from solar pump
6. Future recommendation
7. Acknowledgement


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1. INTRODUCTION

Dr. Rafiq Zakaria College for Women, Navkhanda, Aurangabad is in Maharashtra State. This college is affiliated to Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. This college is established in the year 1990, which has been imparting higher education up to UG, P.G. & Research in Arts & Science faculties. College campus consists of building named as Main Building-A (Baradari) in which administrative office, Library-B, Canteen-C, Various HOD cabins, Staff rooms, Classrooms, various laboratories like, Chemistry, Physics, botany & Zoology are functioning with basic motto to impart quality, employment and entrepreneurship to mostly urban as well as marginal rural students. This college also provides sports facilities to student undergoing through various type of physical education. There is also beautiful library Block-B where student studying in various branches have facility to refer books. The college developed garden & teak wood plantation in campus.

2. ELECTRICAL MAINTAINS COMMITTEE

- | | | |
|----|-------------------|----------|
| 1. | Dr. S. Q. Chishty | Chairman |
| 2. | Dr. QuadriFirdous | Member |
| 3. | Dr. Shaikh Irfan | Member |
| 4. | Dr. BushraZareen | Member |
| 5. | Shri Tajuddin | Member |


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3. OBJECTIVES

To study present level of Energy Consumption



Dept.	No. of Fans	No. of Tubes	No. of LEDs	Computer	Printer	A.C.	Inverter	Photo copy machine
Principal Chamber	2	0	5	2	2	1		1
VP Cabin	1	0	8	1	1		1	1
Ground Floor	3							
Store	0							
Ladies Wash Room	1		2					
Ladies Staff Room	2	6						
Gents Staff Room	3	6						
IQAC Cabin	1	0	2	2	1	1		
Canteen Areas	3	1	1					
Home Science	6	11	6					
Office	6	8	6	10	6	2	0	0
Reading Room	7	2	9	1				
Office Corridor	2							
Library	8	9		9	1			
Dept. Physics	4	6	4					
Corridor	1	2						
Dark Room	1	4						
Computer Dept.	3	11	0	30	1	2		
Chemistry Lab-1	3	9	0					
Chemistry Lab-2	3	9						
Chemistry Lab-3	3	9						
Chemistry Lab-4	2	7						
Chemistry Dept.	2	6	0	1	1	0	0	0
Dept. of Zoology	2	12						
Dept. of Botany	2	9						
Corridor	4	2						
Security Cabin	0							
First Floor	5	0	1					
Store	1	4						


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Dept. of Physical Edu.	2	1	1					
Sport Room	2	2						
Botany Sr.	1	2						
Botany Sr. Lab.	2	5						
Dept. of Pscy.	4	12						
Dept. of English	1	1						
Corner Room	2	3						
Dept. of Urdu	1		2					
Second Floor	0							
Political Science	2	3						
Physics HOD	1	2	0	1	1			
Anti Chamber	1	3						
Language Lab	2	3	2	8	1			
Hall No. 1	9	25	0	0	0	0	0	0
Hall No. 2	6	10	1	0	0	0	0	0
Hall No. 3	5	8	2	0	0	0	0	0
Hall No. 4	4	10	1	0	0	0	0	0
Hall No.5	4	12	0	0	0	0	0	0
Hall No.6	2	2	1	0	0	0	0	0
Hall No.7	2	2	1	0	0	0	0	0
Hall No.8	2	2	0	0	0	0	0	0
Hall No.9	0	0	0	0	0	0	0	0
Hall No.11	5	4	0	0	0	0	0	0
Hall No.12	6	4	0	0	0	0	0	0
Hall No.16	4	6	3	0	0	0	0	0
Hall No.18	4	4	1	0	0	0	0	0
	155	259	59	65	15	6	1	2

Exhaust Fan 8
Fridge 2
Oven 4
TV 1
Focus 3

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4. Methodology:-

a. Electrical Devices wise load


Electrical Devices	Total No.	Watt	Total Watt
Fluorescent Tube	259	40	10360
LED Tub	59	20	1180
Fan	155	90	13950
Computer	65	60	3900
Printer	15	250	3750
A.C.	6	1440	8640
Inverter	1	325	325
Exhaust Fan	8	45	360
Fridge	2	100	200
Oven	4	1860	7440
T.V.	1	110	110
Focus	3	100	300
Xerox	2	1250	2500
		Total	53015

Pump 5 HP	1	746	3750
Pump 1 HP	1	746	746
		Total	4496

	53015
Total	57511
Total Load	57.511KWH

Total Load = 57.511 KW/hr


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b. Study of Electrical Energy Consumption

Electrical Bill Analysis: 2021-22

There is only one type of electricity connection being power supplied by MSEDCL. Monthly electricity bill is served by MSEDCL against electricity used & is paid by college.

A Cost of power is worked out by summing up total KWH of all connections & their amount over the year 2021-22. By dividing total amount by total works out average cost of power per KWH.

Month	Connection No & Tariff Category	
	LT Cons. No.-490010179979	
	Tariff-LT-VII B-I	Load KVA-23
May-22	2502	33825.02
Apr-22	2665	34801
Mar-22	2482	32348
Feb-22	1790	24226
Jan-22	1674	36992
Dec-21	2294	29235
Nov-21	1614	21966
Oct-21	2256	29926
Sept-21	1572	21510
Aug-21	1871	24239
Jul-21	1738	23286
Jun-21	1445	20154
	23903	332508.02
Average cost of power per KWH works out to be		
Rs. 13.91072334		

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c. Analysis of connected load in campus other than motive power:-

As viewed from below table, it understand that lightening & fan load has dominance in total load mix & shares more electric consumption. This load has most potential to identify energy saving opportunity.

Type	No	Total KW	% Load
Lighting Load	318	11.54	22.0882
Fan Load	155	13.95	26.7011
Computer Load	65	3.9	7.46483
AC & Fridge	8	8.84	16.9203
Inverter	1	0.325	0.62207
Printer & Xerox	17	6.25	11.9629
Oven	4	7.44	14.2406
Total	568	52.245	100

d. Analysis of connected Load of motive power:-

Pump 5 HP	1	746	3750
Pump 1 HP	1	746	746
		Total	4496

Total power connected for motive power = 4.496 KWH


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5. Recommendation:-


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6.

a. Energy Saving from motion sensor proposal:-

To install motion sensor at Principal office, Seminar Hall

Energy Saving

Total lighting & fan load of Principal office, Seminar Hall KW	5.000
Existing operating hours per day	7
Assumed operating hours after installing motion sensor per day	3
Total annual existing energy consumption in KWH/ Annum for 300 working days	2390
Total annual proposed energy consumption in KWH/ Annum for 300 working days	3398
Total annual proposed energy consumption in Rs for 300 working days and taking (13.9 Rs/ KWH)	15420
Total Annual existing consumption in Rs for 300 working days and taking (9.0 Rs / KWH)	4755
Total annual energy saving by using motion sensor in KWH	200
Total annual energy saving by using motion sensor in Rs	2800
Total amount of investment for 1 no. of motion in Rs. (Rs.1000)	3000
Payback period in months only	6
Estimated list of proposed system in year	3

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b. Energy savings from solar pump:-

Electrical motor pump replaced by solar pump

Energy saving

Total electricity required for electric pump in KWH	4.5
Existing operating hours per day	4
Total annual existing energy consumption in KWH/ Annum for 300 working days	1350
Total annual existing energy consumption in Rs for 300 working days and taking (9.0 Rs. / KWH)	18900
Total amount of investment for solar pump	---
Payback period in year	4




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7. Future recommendation:-

- Replacement of Fluorescent tube, Fan by LED tube and Atomberg ceiling fans we will save 9548 units and Rs. 40101 per year for 100 % live load.
- To install motion sensor at Principal office, Seminar Hall we will save 200 units and Rs 2800 per year for 100 % live load
- Department wise KWH meter installation is necessary to monitor & control use of electricity by concern department to enable to fix responsibility.
- Awareness among staff & students through Display Board, Rallies etc.
- Wind mill project.

8. Acknowledgement

Department of Physics Dr. Rafiq Zakaria College for Women, Navkhanda, Aurangabad is very much thankful to Principal, **Dr. Maqdoom Farooqui** for motivating us for energy audit.

Chairman

Electrical committee
Dr. S. Q. Chishty

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