

LOHIA COLLEGE, CHURU

ENERGY AUDITING

Introduction and objectives-

An energy audit is a method to determine energy efficiency. Simply energy efficiency means using less energy to do the same job. The audit will provide a complete electricity consumption and energy efficiency assessment.

We can obtain important information regarding our energy usage and Energy Star rating from the audit report. With this information, we can identify and correct any energy usage issues to cut electricity costs.

An energy audit can also help us to reduce carbon footprint by pinpointing trouble areas in our institute building that may be wasting energy. And as we know, reducing energy consumption can help save money on energy bill.

General steps-

Data collection
Documentation with physical evidences
Periodic evaluation with requirements and appropriate standards

The audit process-

The present audit is a Pre audit to collect the details required for external auditing.

The pre audit activities include the following:

- The sites / area that are to be audited need to be determined and selected.
- The auditee was informed of the date of the audit
- The audit scope was identified.
- The audit plan was designed effectively.
- Audit team responsibility were established.
- Facilitate the auditors to 'investigations' on the sites.
- The background information of the college, layout and processes, and the relevant regulations and standards, were collected.

Procedure or methodology followed

In order to perform energy audit, the methodology include physical inspection of the campus, observation and review of the documentation.

Data Collection

Systematic and comprehensive data collected from all over the sites / area of the campus

Data Analysis

Analysis of Electricity consumption and costs

Report

Total Campus Area & College Building Spread Area

Campus area	70333.55 m2
Built up area	46346.55m2

Analysis of electricity consumption and managements

The college is well equipped with electricity supply. Each department possess computers, printers, fans, plug points, tube lights, bulbs, LED lights, CFL, etc. In addition to these equipment, this college also has various equipment's run on electricity such as Autoclave, centrifuge, bell, hot plate, hot air oven, colorimeter, tube-well motor, etc.

Electrical fixtures-

S N	R N	ALLOTTED TO	LED 10 W	LED 12 W	LED 15 W	LED 20 W	T L 36 W	BULB 100/200 W	FAN wall	FAN ceiling	other
1	1	Principal Room	2	2	1	2	1	-	-	2	Ex Fan
2	-	Gallary Principal Room	1	-	-	-	-	-	-	1	-
3	2	Vice Principal	1	-	-	-	2	-	-	1	Ex Fan
4	3	Exam. Control Room	2	-	1	1	2	-	2	2	-
5	4	Academic	-	2	-	1	1	-	2	2	-
6	5	AC. Section	3	3	3	1	4	-	1	5	Invertor Photostate

7	6	Class Room	-	1	-	4	-	-	-	10	-
8	7	Sanskrit Department	-	-	1	2	-	-	-	3	-
9	8	Dishari	-	-	-	-	2	-	-	3	-
10	9	Class Room	-	-	1	4	-	-	-	7	-
11	10	English Department	-	-	1	-	2	-	-	1	-
12	11	IQ Ac	1	-	-	-	2	-	-	1	-
13	12	Class Room	-	-	2	2	-	-	-	7	-
14	13	Class Room	-	1	-	1	-	-	-	1	-
15	14	Hindi department	-	1	-	2	-	-	2	1	-
16	15	IGNOU	-	2	-	3	2	-	-	5	-
17	16	Class Room	-	-	-	-	6	-	-	8	-
18	17	Class Room	-	-	1	-	5	-	-	8	-
19	18	Class Room	-	-	-	2	-	-	-	4	-
20	19	Class Room	2	3	-	-	-	-	-	8	-
21	20	incubation centre	-	-	-	-	-	-	-	-	-
22	21	incubation centre	-	-	-	-	-	-	-	-	-
23	22	incubation centre	-	-	-	-	-	-	-	-	-
24	23	incubation centre	-	-	-	-	-	-	-	-	-
25	24	incubation centre	-	-	-	-	-	-	-	-	-
26	25	incubation centre	-	-	-	-	-	-	-	-	-
27	26	incubation centre	-	-	-	-	-	-	-	-	-
28	27	incubation centre	-	-	-	-	-	-	-	-	-
29	28	incubation centre	-	-	-	-	-	-	-	-	-
30	29	Class Room	1	1	-	2	-	-	-	6	-
31	30	Class Room	-	1	2	-	1	-	-	3	-
32	31	Class Room	-	-	-	3	-	-	-	10	-
33	32	Class Room	1	-	-	2	-	-	-	6	-
34	33	Class Room	-	-	-	2	-	-	-	6	-
35	34	HIST. Department	-	1	-	4	1	-	-	3	Printer Photostat
36	35	Student union	-	-	2	-	2	-	1	2	-

37	36	Class Room	-	-	-	4	6	-	-	8	-
38	37	Class Room	-	2	-	-	4	-	-	4	-
39	38	Class Room	-	2	-	-	4	-	-	4	-
40	39	Class Room	-	2	2	2	-	-	-	8	-
41	40	Class Room	-	1	-	-	-	-	-	1	-
42	41	Class Room	-	-	-	1	-	-	-	1	-
43	42	NCC	-	1	-	1	-	-	-	1	-
44	43	Class Room	-	2	-	-	-	-	-	4	-
45	44	NSS	-	1	-	1	-	-	1	1	-
46	45	Urdu	-	-	-	1	2	-	1	1	-
47	46	Games	-	1	-	1	1	-	-	1	-
48	47	Pol. Sci.	-	-	1	-	3	-	2	1	-
49	48	Class Room	-	1	-	-	-	-	-	1	-
50	49	Commerce	2	-	-	-	2	-	2	2	-
51	50	Class Room	1	2	-	3	-	-	-	8	-
52	51	Staff Room	5	-	3	-	3	-	-	6	-
53	52	Class Room	-	1	2	2	-	-	-	4	-
54	53	Class Room	-	1	2	2	-	-	-	4	-
55	54	College Store	4	1	1	-	1	-	1	2	-
56	55	Book Bank	1	-	-	-	1	-	-	1	-
57	56	Jalghar	-	12	-	-	-	-	-	-	-
58	57	TPP Room	1	-	-	-	1	-	-	1	-
59	58	Scholarship	-	1	-	-	1	-	1	1	-
60	59	Guest room	2	1	-	-	2	-	-	2	-
61	60	Counter room	-	2	-	2	-	-	-	2	-
62	101	Chem. Lab./Comp. Lab	1	1	-	-	4	-	5	4	Photostat
63	102	M.Sc. F lab	-	-	-	-	6	-	-	4	Oven Vacuum pump
64	103	UG Lab	-	2	4	-	11	-	1	5	-
65	104	Store Chem.	-	-	1	-	-	-	-	-	Incubator
66	105	M.Sc. (P) Lab	-	-	1	-	5	-	-	1	Oven

67	106	Chem. Res. Lab	-	2	-	-	3	-	-	1	-
68	107	Chem. Store	-	-	-	-	-	1	-	-	-
69	108	Zoology ug Lab	-	-	-	2	1	-	-	4	-
70	109	Zoology Store	-	-	1	1	1	-	-	1	-
71	110	Zoology Library	1	-	-	2	-	-	-	1	-
72	111	Class Room	-	-	-	3	1	-	-	7	-
73	112	Zol Museum	-	-	-	2	-	-	-	2	-
74	113	Zol Staff Room	1	-	1	2	1	-	-	2	-
75	114	Zol pg Lab	-	-	2	-	6	-	-	5	-
76	115	Class Room	-	-	-	8	-	-	-	8	-
77	116	Class Room	-	-	-	8	-	-	-	8	-
78	117	Class Room	-	-	-	4	-	-	-	4	-
79	118	Zol pg Lab	-	2	-	2	-	-	-	5	-
80	119	Zol Res lab	-	-	-	2	-	-	-	1	-
81	120	Class Room	-	-	4	-	-	-	-	6	-
82	121	Class Room	-	-	-	-	3	-	2	1	-
83	122	Class Room	1	-	-	1	1	-	-	6	-
84	123	E-class	-	1	-	-	-	-	4	4	Floodlight Proj.
85	124	Botany pg lab	-	-	-	-	4	-	-	5	-
86	125	Class Room	-	-	-	-	6	-	-	8	-
87	126	Class Room	-	-	-	-	2	1	-	4	-
88	127	NRC	-	-	-	-	2	-	-	4	-
89	128	Botany pg lab	-	-	2	-	2	-	-	8	-
90	129	Botany Store	-	-	1	-	-	-	-	1	-
91	130	Botany UG lab	-	1	2	-	2	-	-	8	-
92	131	Karamchari union	-	1	-	1	1	-	-	1	-
93	132	Botany Store	-	-	-	-	1	-	-	1	-
94	133	Botany Res lab/lib	-	-	-	1	4	-	-	2	-
95	134	Botany Staff Room	1	-	-	1	3	-	-	3	-
96	135	Botany EQP room	2	1	-	-	4	-	2	-	-

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97	136	Phy Lab	-	-	-	-	2	-	-	3	-
98	137	Phy Lab	-	-	1	1	2	-	-	4	-
99	138	Phy Lab	-	2	2	1	9	-	-	8	-
100	139	Seminar Room	-	-	-	4	-	-	10	-	-
101	140	Class Room	-	-	1	2	-	-	-	6	-
102	-	gallery Acc sec to Staff room	4	2	-	-	-	-	-	-	-
103	-	gallery R.No 6 to 51	4	1	-	4	-	-	-	-	-
104	-	gallery R.No 36 to 50	3	4	-	4	-	-	-	-	-
105	-	gallery R.No 29 to 35	2	-	-	-	-	-	-	-	-
106	-	gallery R.No 6 to 19	4	2	-	-	-	-	-	-	-
107	-	gallery Between Geo and Hall	2	-	-	1	-	-	-	-	-
108	-	gallery Front of Hall	-	-	-	1	-	-	-	-	-
109	-	Girls common room gallery	-	1	-	-	-	-	-	-	-
110	-	Girls common room	5	2	2	-	6	-	-	10	-
111	-	NSS Store	-	1	-	-	-	-	-	-	-
112	-	Hall	6	2	1	5	8	-	8	9	-
113	-	Geo Dept	3	6	4	3	12	-	3	28	-
114	-	Maths Dept	1	-	-	-	2	-	2	2	-
115	-	Esttb. Section	-	1	-	-	-	-	-	1	-
116	-	Canteen near staffroom	-	1	-	-	-	-	-	1	-
117	-	Library	4	-	15	30	7	-	3	65	-
Total			75	88	71	154	186	2	56	447	

20/10/21

Details of Computers and other items

Dept	PC	Printer	MFP	Scanner	Photocopier	UPS	Projector	visualiser	IB
CHEM	9	3	2	1	1	6	1	1	1
ZOOLOGY	2	2			1	2	1	1	1
BOTANY	2	2	1		1	3	1	1	1
PHYSICS	2	1				3	1	1	1
GEOG	2	2	1	1	1	1	1	1	1
COM	2	1		1		1			
HIST	1	1				1	1	1	1
POL SC	1				1	1	1	1	1
URDU	1	1				1			
NRC	15	2		1		2			
CFC	2	1	1			1			
e CLASS	1	1							
A/C	1	1		1	1				
ESTB	1	1		1		1			
LIB	1		1		1	1			
STORES	1				1				
NCC	1	1							
P & VP	1				1				
YDC		1	1				1		
NSS	1	1							
SANSKRIT	1	1							
SCHOLARSHIP	2	1							
Academic	1					1			
English	1								
VMOU	1		1						
Total	53	24	7	6	9	24	8	7	7

S.No.	Electric Item	Total no	Watt/Consumption by each unit	Installed at
1	AC	5	2*1.5 T 3*2.0T	Principal room, Botany, Chemistry, Seminar hall
2	Water Cooler	2	1500W	at Water hut
3	RO with Cooling System	1	2000W	at Water hut
4	Fridge	4	60W	Botany, Chem,Zoo, Store
5	Doan Light	35	36W	Seminar Hall, Library, R.No 115,116
6	Doan Light	36	12W	Ground floor & First floor gallery
7	Street light	7	15W	College campus
8	Exhaust Fan	14/2	200W/100W	Account section, Library, Principal room, VP room

Calculation of energy for electrical appliances

Appliance	Power used in (watt)	Number of appliances	Average Usage per day	Average KW per day consumption
Bulb	200 W	1	5	1.5
	100 W	1	5	
LED	10 W	75	5	26.05
	12W	88		
	15W	71		
Tube Light	36 W	186	5	33.48
Doan Light	36W	35	5	8.89
	12W	36		
Wall Fan	40 W	56	5	145
Ceiling Fan	60W	447	3	9
Exhaust fan	200W	14		
Tube Well motor	100 W	2	2	14
	10 hp	1		
AC	1500 W	2	6	18
	2000 W	2		

Induction stove	1500 W	2	1	3
inverters	1000 W	7	2	14
Photocopiers	600 W	5	1	3
Computers	20 W	30	2	1.2
Printer	50 W	10	1	0.5
Modem	5 W	2	10	0.1
Fridge	60 W	4	8	1.92
Water cooler	1500 W	2	1	3
RO with cooling System	2000W	1	1	2
Projector	700 W	1	2	2
Electric bell	20 W	1	1	0.02
CCTV DVR	20 W	20	24	16.8
Television	20 W	1	8	0.16

Total electricity consumption (average as per electricity bills)

In summer- 4640 unit/month

In winter- 3575 unit/month

Suggestions and recommendations

The electricity consumption is really high. Energy consumption could be reduced. Unnecessary lights and fans could be switched off. During daylight, lights can be switched off. Energy conserving methods like usage of LED and CFL bulbs can be appreciated. In this context, solar energy can be used as alternative energy source.

Conclusion

We, the member of pre audit team, believe that we have successfully completed the analysis of electrical fixture components in the campus. We hope that the suggestions put forward by us would be considered by the college and implemented as soon as possible.

Post audit activities begin with the preparation of a draft report. The draft report should be reviewed by the personnel directly involved in the audit. The final report should be derived from it and it should then be distributed to all departments within the college. It is important for college administration to follow -up the report and develop an action plan to implement audit findings.

Acknowledgement

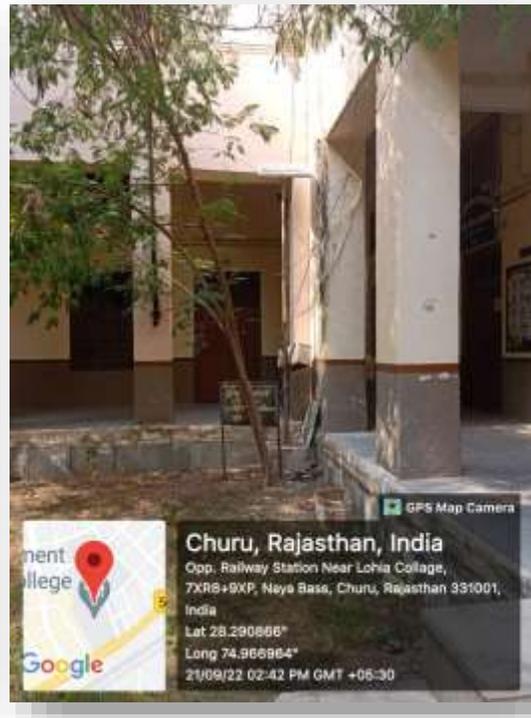
We would like to sincerely thank all the departments, teaching and nonteaching staff of the college for their cooperation during the survey. Our special thanks to Shri Bhanwar Lal Verma, mechanic & store in charge of the college.

This audit report submitted by internal audit team constituted by principal



Principal Lohia College, Churu

Solar street Lights in the campus



2021/09/22



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