

**ENERGY AUDIT REPORT
FOR
POORNIMA COLLEGE OF ENGINEERING
ISI-6, RIICO INSTITUTIONAL AREA, GONER ROAD,
SITAPURA, JAIPUR - 302022**



**Carried On
For Academic Session
(2019-2020)**

Carried Out By




ELION TECHNOLOGIES & CONSULTING PVT LTD

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INDEX

S No.	Description	Page No.
1	Executive Summary	2
2	Chapter - I Introduction	4
3	Chapter - II Acknowledgement	6
4	Chapter - III Process Description & Energy Consumption Details	7
5	Chapter - IV Lighting System	9
6	Chapter - V Motors and Pumps	11
7	Chapter - VI Air Conditioning	12
8	Chapter - VII Fans	13
9	Conclusion	14


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EXECUTIVE SUMMARY

Poornima College of Engineering, the pioneer institute of Poornima Group was established in 2000 with the aim of imparting pragmatic technical education. In its magnificent journey of 20 years, PCE has set benchmarks and reached new pinnacles in engineering education with dedication, perseverance and devotion. With student strength of approx. 2,400 studying six specializations of engineering (CSE, ECE, EE, ME, Civil & IT), more than 3.5 Lacs square feet of built up area, highly qualified faculties, state of the art infrastructure, good placements and industry-led curriculum, PCE is marching ahead of others with tremendous growth since its inception.

PCE is spearheading its outstanding voyage with the motto 'Success is not a destination, it's a journey'. NBA Accreditation in CE, EE & ECE department established PCE as a leading institution of National repute. Poornima College of Engineering, Jaipur has been ranked 2nd out of approx. 144 Engineering Colleges in QIV Ranking of Rajasthan Technical University, Kota. The QIV Ranking is based primarily upon Academics, University results, Placements & Alumni.

Vision

To create knowledge based society with scientific temper, team spirit and dignity of labour to face the global competitive challenges


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Electricity is supplied by Jaipur Vidyut Vittaran Nigam Limited and for backup powers supply DG Set of 500KVA are available.


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Elion Technologies and Consulting Pvt Ltd team conducted the detailed Energy audit for academic session 2019-2020. The energy audit was carried out remotely by Narinder Khanna BEE Certified Energy Auditor (EA-1192).

The remote energy audit included detailed data collection, analysis of data and identification of specific energy saving proposals.


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CHAPTER – I

INTRODUCTION

M/S PCE, Jaipur evinced interest in availing the services of Elion Technologies and Consulting Pvt. Ltd for conducting remote energy audit of their premises.

Elion Technologies and Consulting Pvt Ltd team conducted the Detail Energy audit for academic session 2019-2020.


This report is on the energy audit carried out M/S PCE, Jaipur. The detailed energy audit comprised of the following activities:

- Data collection of power consuming equipment's.
- A brief session on energy management was conducted to seek more inputs from the personnel engaged in operation and maintenance of electro mechanical services.
- Analysis of collected data.
- Discussion with the officials on the identified proposals.
- Discussion and reporting of the findings of energy audit with the Engineers and management staff.

All the identified energy savings proposals have been discussed with the executives concerned before finalizing the projects.

The contents of the report are based solely on the data provided by PCE, Jaipur officials during the energy audit.

The management should implement the suggestions made in the report after verifying requisite safety aspects.


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Methodology for Energy Audit:

The following is a list of general procedure and information undertaken during the energy audit:

1. General information of the plant.
2. Baseline energy description.
3. Past energy consumption bills which includes electricity bills.
4. On site data collection
5. Energy analysis of different sectors.
6. Recommendation of energy conservation measures.

The primary goal of the energy audit was to identify sources and areas of potential energy savings and cost saving throughout the Plant by measures of optimization, replacement, retrofitting, and on the other hand, to also provide recommendations on operational and maintenance practices improvements.


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CHAPTER – II

ACKNOWLEDGEMENT

Elion Technologies and Consulting Pvt Ltd places on record it's thanks to M/S PCE, Jaipur for entrusting the task of conducting energy audit study.

We acknowledge with gratitude the whole hearted support and cooperation extended by all team members while carrying out the study.




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CHAPTER – III

PROCESS DESCRIPTION & ENERGY CONSUMPTION DETAILS

PROCESS DESCRIPTION

The main areas of energy consumption as observed during the audit are as follows:

- Motors
- Air Conditioner
- Lighting


The main sources of energy to meet the required consumptions are as follows:

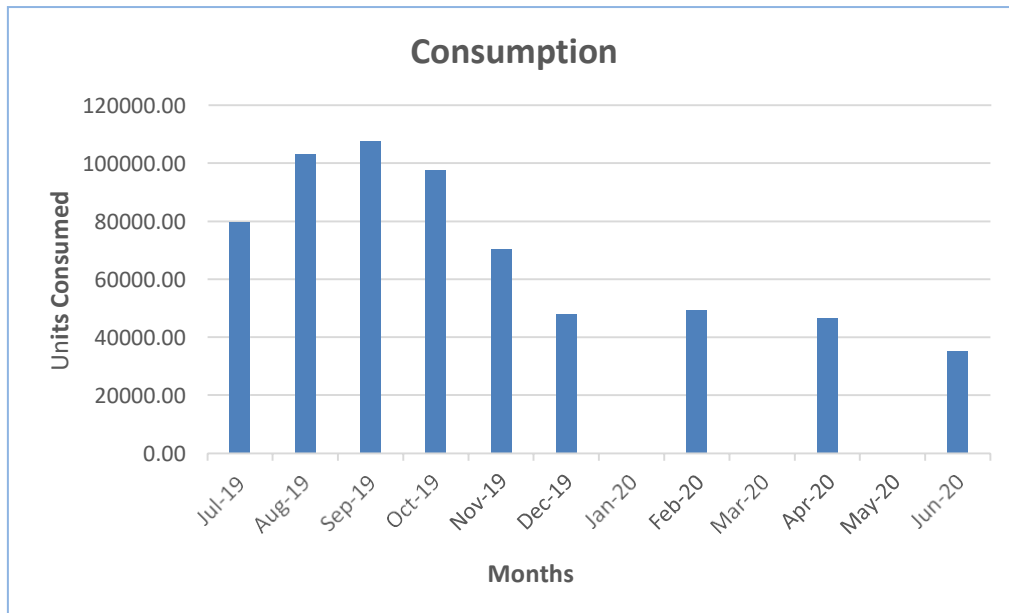
- Electricity supply from Power distribution company
- DG set of 500KVA


Consumption pattern for energy is given below:

ELECTRICITY CONSUMPTION PATTERN

Months	Consumption
Jul-19	79850
Aug-19	103010
Sep-19	107530
Oct-19	97750
Nov-19	70250
Dec-19	47810
Jan-20	-
Feb-20	49380
Mar-20	-
Apr-20	46725
May-20	-
Jun-20	35370


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CHAPTER – IV

LIGHTING SYSTEM

The inventory of lighting was collected and following is the summary:

Type- LED/CFL/Conventional -Bulb/Tube Light	Building	Location	Rating	Qty	Number of Hours being turned on
Tube light	Admin	LGF	40W	142	6-8 hrs
Tube light	Admin	UGF	40W	58	6-8 hrs
Tube light	Admin	FF	40W	115	6-8 hrs
Tube light	Admin	SF	40W	62	6-8 hrs
Tube light	Admin	TF	40W	68	6-8 hrs
Tube light	Central building	LGF	40W	88	6-8 hrs
Tube light	Central building	UGF	40W	76	6-8 hrs
Tube light	Central building	FF	40W	105	6-8 hrs
Tube light	Central building	SF	40W	62	6-8 hrs
Tube light	Central building	TF	40W	92	6-8 hrs
Tube light	1 st year Block	LGF	40W	58	6-8 hrs
Tube light	1 st year Block	UGF	40W	55	6-8 hrs
Tube light	1 st year Block	FF	40W	58	6-8 hrs
Tube light	1 st year Block	SF	40W	59	6-8 hrs
Tube light	1 st year Block	TF	40W	58	6-8 hrs
Tube light	Admission Block	GF	40W	32	6-8 hrs
Hostel 1-Tubelight	G+4		40	151	6-8 hrs
Hostel 2-Tubelight	G+4		40	151	6-8 hrs
Hostel 3-Tubelight	G+4		40	207	6-8 hrs
Hostel 4-Tubelight	G+4		40	81	6-8 hrs
Hostel 5-Tubelight	G+4		40	84	6-8 hrs
Hostel 6-Tubelight	G+4		40	89	6-8 hrs
LED	Admin		20	12	6-8 hrs
LED	Central building		20	10	6-8 hrs
LED	1 st year Block		20	0	6-8 hrs
LED	Admission Block		20		6-8 hrs


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Observation:

Most of the lighting used are tube light and LED are used in certain locations. It was informed that college has planned to replace CFL and Tube light in phased manner with replacement of faulty lights with LED.

Recommendation:

- Sticker to SWITCH OFF LIGHT and SAVE ENERGY to be displayed.
- Tube lights to be changed to LED.





CHAPTER – V

MOTORS AND PUMPS

Pumps are used for pumping of water. The details of the pumps and motors are given below:

PUMPS:

Name of Pump and make	Running Hours	No	Rated Capacity in HP	Flow Rate	Head	RPM
Submersible pump - Crompton	12 to 14 hrs	8	5	NA	NA	NA
Tube well pump - pluga	12 to 14 hrs	5	5	NA	NA	NA

MOTORS:


Name of Motor and make	Running Hours	No	Rated Capacity in HP	Efficiency	Ampere	RPM
Motor - Siemens	10-12 hrs in summer	2	10	NA	NA	NA
Motor - Siemens	10-12 hrs in summer	25	7.5	NA	NA	NA
Motor - Siemens	10-12 hrs in summer	2	5	NA	NA	NA
Motor - Centrifugal	10-12 hrs in summer	2	10	NA	NA	NA
Motor - Centrifugal	10-12 hrs in summer	20	7.5	NA	NA	NA
Motor - Centrifugal	10-12 hrs in summer	0	5	NA	NA	NA

Observation:

All pumps and motors are functioning properly and well maintained.

Recommendation:

Proper maintenance and upkeep of pumps and motors to be done.


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CHAPTER – VI

AIR CONDITIONING

Split and Window AC's are used in facility for air conditioning. Temperature maintained is around 24°C. Following is the summary of air conditioners installed:

S. No	Location	Capacity in ton	Star rating	Set temp	Running hours
1	Admin	1500	3 to 4	24	6-8 hrs in summer
2	Central building	2000	3 to 4	24	6-8 hrs in summer
3	1 st year Block	2000	3 to 4	24	6-8 hrs in summer
4	Admission Block	1500	3 to 4	24	6-8 hrs in summer

Observation:

All air conditioners are found to be functioning properly and well maintained. The set temperature should be 24°C -26°C for efficient working.

Recommendation:

All doors to be kept closed while using the air conditioner and regular annual services of AC should be carried out.


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CHAPTER – VII

FANS

Fans are installed in the institute in various blocks. Following is the summary of fans installed:

Type	Building	Location	Rating	Qty	Number of Hours being turned on
Fan	Admin	LGF	50-75	106	6-8 hrs
Fan	Admin	UGF	50-75	70	6-8 hrs
Fan	Admin	FF	50-75	59	6-8 hrs
Fan	Admin	SF	50-75	78	6-8 hrs
Fan	Admin	TF	50-75	83	6-8 hrs
Fan	Central building	LGF	50-75	87	6-8 hrs
Fan	Central building	UGF	50-75	82	6-8 hrs
Fan	Central building	FF	50-75	84	6-8 hrs
Fan	Central building	SF	50-75	74	6-8 hrs
Fan	Central building	TF	50-75	93	6-8 hrs
Fan	1 st year Block	LGF	50-75	46	6-8 hrs
Fan	1 st year Block	UGF	50-75	43	6-8 hrs
Fan	1 st year Block	FF	50-75	59	6-8 hrs
Fan	1 st year Block	SF	50-75	44	6-8 hrs
Fan	1 st year Block	TF	50-75	57	6-8 hrs
Fan	Admission Block	GF	50-75	34	6-8 hrs
Hostel 1-Fan	G+4		50-75	124	6-8 hrs
Hostel 2-Fan	G+4		50-75	109	6-8 hrs
Hostel 3-Fan	G+4		50-75	179	6-8 hrs
Hostel 4-Fan	G+4		50-75	55	6-8 hrs
Hostel 5-Fan	G+4		50-75	65	6-8 hrs
Hostel 6-Fan	G+4		50-75	66	6-8 hrs




CONCLUSION

The energy audit conducted at PCE, Jaipur has revealed that PCE is doing good work in having sustainable college. The college is sustainable in energy consumption. To further reduce energy consumption, college should implement the recommendations made in report. One more important recommendation is that the college should install roof top solar plant. It is alternate clean source of energy and have advantages like

- Hedge against electricity charges
- Tax benefit
- Minimum Investment at risk
- Guaranteed saving on electricity
- Provides shade on roof hence reduce heat gain

So college must install solar power plant




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Also solar power plant of capacity 184KW is installed in the college.

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CHAPTER – III

PROCESS DESCRIPTION & ENERGY CONSUMPTION DETAILS

PROCESS DESCRIPTION

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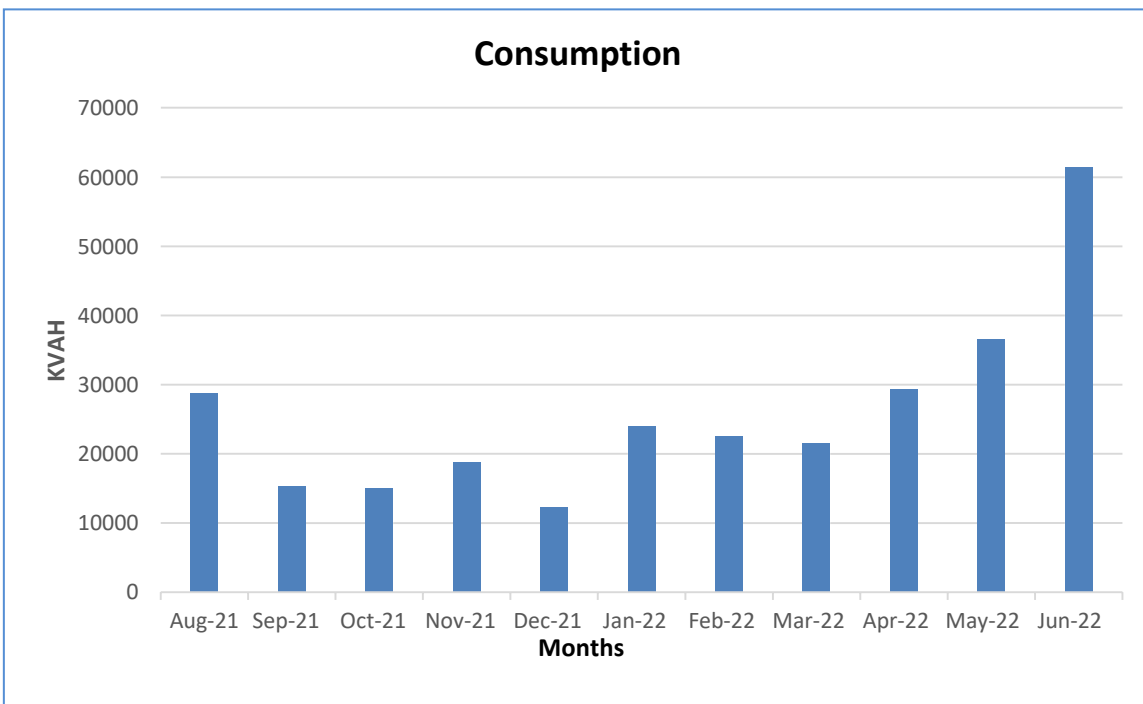
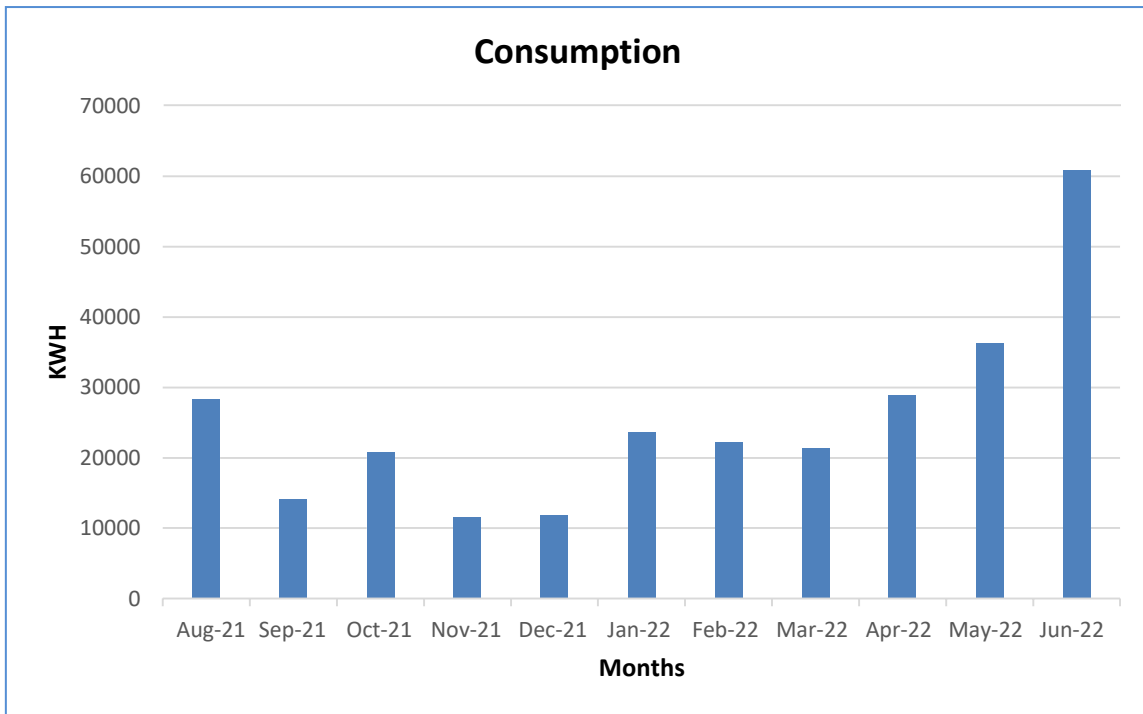
- Electricity supply from Power distribution company
- DG set of 500KVA
- Solar Power Plant of 184KW


Consumption pattern for energy is given below:

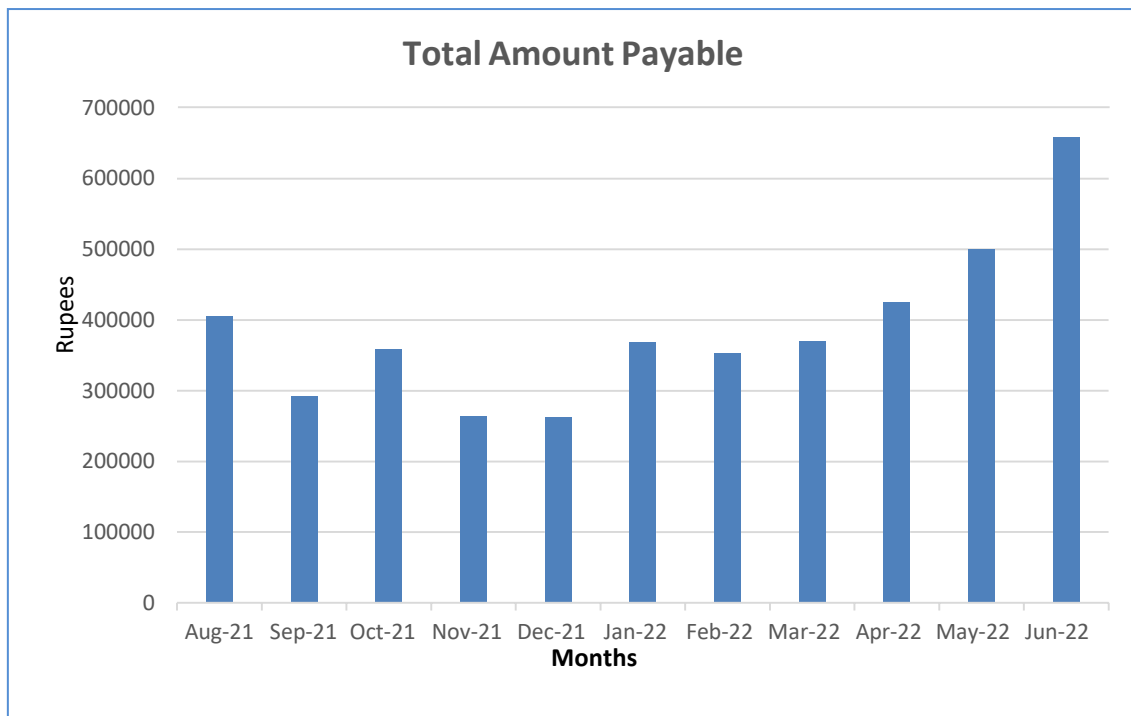
ELECTRICITY CONSUMPTION PATTERN


Month	KWH	KVAH	Total Amount Payable
Aug-21	28411	28718	405915
Sep-21	14210	15270	291905
Oct-21	20815	14965	358176
Nov-21	11600	18760	264485
Dec-21	11895	12235	261775
Jan-22	23680	23930	368241
Feb-22	22295	22580	352934
Mar-22	21400	21510	369351
Apr-22	28975	29305	425466
May-22	36335	36650	499835
Jun-22	60870	61485	658067


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CHAPTER – IV

LIGHTING SYSTEM

The inventory of lighting was collected and following is the summary:

Type-LED/CFL/Conventional -Bulb/Tube Light	Building	Location	Rating	Qty	Number of Hours being turned on
Tube light	Admin	LGF	40W	108	6-8 hrs
Tube light	Admin	UGF	40W	53	6-8 hrs
Tube light	Admin	FF	40W	98	6-8 hrs
Tube light	Admin	SF	40W	58	6-8 hrs
Tube light	Admin	TF	40W	61	6-8 hrs
Tube light	Central building	LGF	40W	84	6-8 hrs
Tube light	Central building	UGF	40W	74	6-8 hrs
Tube light	Central building	FF	40W	101	6-8 hrs
Tube light	Central building	SF	40W	59	6-8 hrs
Tube light	Central building	TF	40W	89	6-8 hrs
Tube light	1 st year Block	LGF	40W	57	6-8 hrs
Tube light	1 st year Block	UGF	40W	46	6-8 hrs
Tube light	1 st year Block	FF	40W	55	6-8 hrs
Tube light	1 st year Block	SF	40W	52	6-8 hrs
Tube light	1 st year Block	TF	40W	53	6-8 hrs
Tube light	Admission Block	GF	40W	26	6-8 hrs
Hostel 1-Tubelight	G+4	-	20	151	6-8 hrs
Hostel 2-Tubelight	G+4	-	20	151	6-8 hrs
Hostel 3-Tubelight	G+4	-	20	207	6-8 hrs
Hostel 4-Tubelight	G+4	-	20	81	6-8 hrs
Hostel 5-Tubelight	G+4	-	20	84	6-8 hrs
Hostel 6-Tubelight	G+4	-	20	89	6-8 hrs
LED	Admin	-	20	81	6-8 hrs
LED	Central building	-	20	73	6-8 hrs
LED	1 st year Block	-	20	0	6-8 hrs
LED	Admission Block	-	20	57	6-8 hrs


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Observation:

Most of the lighting used are tube light and LED are used in certain locations. It was informed by the college that they have stopped further purchasing of tube light. They are replacing all tube light in college in phased manner.

Recommendation:

- Tube lights to be changed to LED.




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CHAPTER – V

MOTORS AND PUMPS

Pumps are used for pumping of water. The details of the pumps and motors are given below:

PUMPS:

Name of Pump and make	Running Hours	No	Rated Capacity in HP	Flow Rate	Head	RPM
Submersible pump - Crompton	12 to 14 hrs	8	5	NA	NA	NA
Tube well pump - pluga	12 to 14 hrs	5	5	NA	NA	NA

MOTORS:

Name of Motor and make	Running Hours	No	Rated Capacity in HP	Efficiency	Ampere	RPM
Motor - Siemens	10-12 hrs in summer	2	10	NA	NA	NA
Motor - Siemens	10-12 hrs in summer	25	7.5	NA	NA	NA
Motor - Siemens	10-12 hrs in summer	2	5	NA	NA	NA
Motor - Centrifugal	10-12 hrs in summer	2	10	NA	NA	NA
Motor - Centrifugal	10-12 hrs in summer	22	7.5	NA	NA	NA
Motor - Centrifugal	10-12 hrs in summer	0	5	NA	NA	NA

Observation:

All pumps and motors are functioning properly and well maintained.

Recommendation:

Proper maintenance and upkeep of pumps and motors to be done.


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CHAPTER – VI

AIR CONDITIONING

Split and Window AC's are used in facility for air conditioning. Temperature maintained is around 24°C. Following is the summary of air conditioners installed:

S. No	Location	Capacity in ton	Star rating	Set temp	Running hours
1	Admin	1500	3 to 4	24	6-8 hrs in summer
2	Central building	2000	3 to 4	24	6-8 hrs in summer
3	1 st year Block	2000	3 to 4	24	6-8 hrs in summer
4	Admission Block	1500	3 to 4	24	6-8 hrs in summer

Observation:

All air conditioners are found to be functioning properly and well maintained. The set temperature should be 24°C -26°C for efficient working.

Recommendation:

All doors to be kept closed while using the air conditioner and regular annual services of AC should be carried out.


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CHAPTER – VII

FANS

Fans are installed in the institute in various blocks. Following is the summary of fans installed:


Type- LED/CFL/Conventional -Bulb/Tube Light	Building	Location	Rating	Quantity	Number of Hours being turned on
Fan	Admin	LGF	50-75	106	6-8 hrs
Fan	Admin	UGF	50-75	70	6-8 hrs
Fan	Admin	FF	50-75	59	6-8 hrs
Fan	Admin	SF	50-75	78	6-8 hrs
Fan	Admin	TF	50-75	83	6-8 hrs
Fan	Central building	LGF	50-75	87	6-8 hrs
Fan	Central building	UGF	50-75	82	6-8 hrs
Fan	Central building	FF	50-75	84	6-8 hrs
Fan	Central building	SF	50-75	74	6-8 hrs
Fan	Central building	TF	50-75	93	6-8 hrs
Fan	1 st year Block	LGF	50-75	46	6-8 hrs
Fan	1 st year Block	UGF	50-75	43	6-8 hrs
Fan	1 st year Block	FF	50-75	59	6-8 hrs
Fan	1 st year Block	SF	50-75	44	6-8 hrs
Fan	1 st year Block	TF	50-75	57	6-8 hrs
Fan	Admission Block	GF	50-75	34	6-8 hrs
Hostel 1-Fan	G+4		50-75	124	6-8 hrs
Hostel 2-Fan	G+4		50-75	109	6-8 hrs
Hostel 3-Fan	G+4		50-75	179	6-8 hrs
Hostel 4-Fan	G+4		50-75	55	6-8 hrs
Hostel 5-Fan	G+4		50-75	65	6-8 hrs
Hostel 6-Fan	G+4		50-75	66	6-8 hrs



CONCLUSION

The energy audit conducted at M/S PCE, Jaipur has revealed that PCE is doing good work in having sustainable college. In house solar power plant is installed as recommended in previous report. The college is sustainable in energy consumption. To further reduce energy consumption, college should implement the recommendations made in the report.




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