ENERGY AUDIT REPORT OF SHRI DHARMASTALA MANJUNATHESHWARA COLLEGE(AUTONOMOUS), UJIRE

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1. INTRODUCTION

An **energy audit** is an inspection survey and an analysis of energy flows for energy conservation in a building. It may include a process or system to reduce the amount of energy input into the system without negatively affecting the output. In commercial and industrial real estate, an energy audit is the first step in identifying opportunities to reduce energy expense and carbon footprint.

An energy audit comprises of a detailed examination of consumption in electrical power, cost of this power consumption, lastly a suggested program for changes in working practices or power consuming equipment that will effectively saves the cost. The energy audit is a positive involvement with a significant advantage to college. The review process begins by gathering data about facility's operation and about its past record of service bills. This data is then inspecting to realize that how much energy is used and wasted. The energy audit presents the current state of the art regarding work performed related to the electric energy consumption for Information and Communication Technologies (ICT) and Miscellaneous Electric Loads (MELs),in office and commercial buildings. Techniques used for measuring the energy consumption of office plug loads, and efforts for saving energy by using this equipment more rationally and efficiently are identified and categorized.

2. NEED FOR ENERGY AUDIT

In an organization like undergraduate and post graduate degree Colleges, one of the top operating expenses is often found to be electrical energy. In most assessments of the manageability of the cost or potential cost savings in the above component, would invariably emerge as a top priority, and thus energy Audit. Energy constitutes a strategic area for cost reduction. A well-done energy audit will always help owners to understand more about the ways energy is used in their organizations, and help to identify 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 programs which are vital for production and utility activities. Such an audit program will help to keep focus on variations that occur in the energy costs, availability, and reliability of supply of energy, help decide on the appropriate energy mix, identify energy conservation technologies, retrofit for energy conservation equipment, etc.

The primary objective of the energy audit is to determine ways to reduce energy consumption per unit of product output or to lower operating costs. The energy audit provides a benchmark, or reference point, for managing and assessing energy use across the organization and provides the basis

for ensuring more effective use of energy.

3. METHODOLOGY

i. The simple Energy Audit procedures adopted for SDM college campus is as follows
ii. The details of all the connected loads were collected by visiting each and every room/ floor.
iii. The approximate working hours of each equipment is identified
iv. Energy consumption for the connected load is calculated considering the electricity bill
v. The energy saving option is identified.
vi. The summary of the audit report is prepared.

4. CONNECTED LOAD DETAILS

The connected load for each area of the college campus is presented here. The load calculation of the campus is done by dividing the whole campus into several blocks as follows

1. SDM MAIN BUILDING/GROUND FLOOR
2. SDM MAIN BUILDING/FIRST FLOOR
3. SDM MAIN BUILDING/SECOND FLOOR
4. SEMINAR HALL
5. LIBRARY
6. SPECIALEQUIPMENTS/LABORATORY
7. PG CENTRE/GROUND FLOOR
8. PG CENTRE/ FIRST FLOOR
9. PG CENTRE/ SECOND FLOOR
10. PG CENTRE/ THIRD FLOOR
11. DHEEMANTH BOYS HOSTEL
12. DHEEMAHI GIRLS HOSTEL
13. MESS HALL OF HOSTELS
14. SIDDAVANA HOSTEL
15. SIDDVANA SPORTS WING
16. PHYSICAL DEPARTMENT AND STADIUM
17. SDM CANTEEN
18. SDM COOPERATIVE STORE

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4.1 SDM MAIN BUILDING/GROUND FLOOR

The below table shows the number of equipments and its total load connected on the ground floor of the campus.

Table-1 Load details of ground floor

Sl.No.	Name of Equipment	Quantity	Rating of Equipment (W)	Average running hour per day	Energy consumption per month(kWh)
1	Incandescent Bulb	49	60	7	535.08
2	Compact Fluorescent Lamp (CFL)	12	13	8	32.448
3	Fluorescent tube light	112	40	7	815.3
4	T5 tube	30	21	8	131.04
5	Ceiling fan	30	78	7	425.88
6	LED Light	80	13	7	189.28
7	Exhaust fan	12	40	7	87.3
8	Air Conditioner	7 5	1500 1000	8 8	2184 1040
9	Personnel Computer	51	200	4	1060.8
10	Printer	9	300	4	280.8
11	Fridge	3	150	8	96.6
12	LCD TV	1 1	155 65	1 1	4.03 1.69
13	Transmitter	1	50	24	31.6

14	Sound Box	2	400	2	41.6
15	UPS in kVA	12	7.5/10/5/8/ 15	1	324.7
	TOTAL				7282.1

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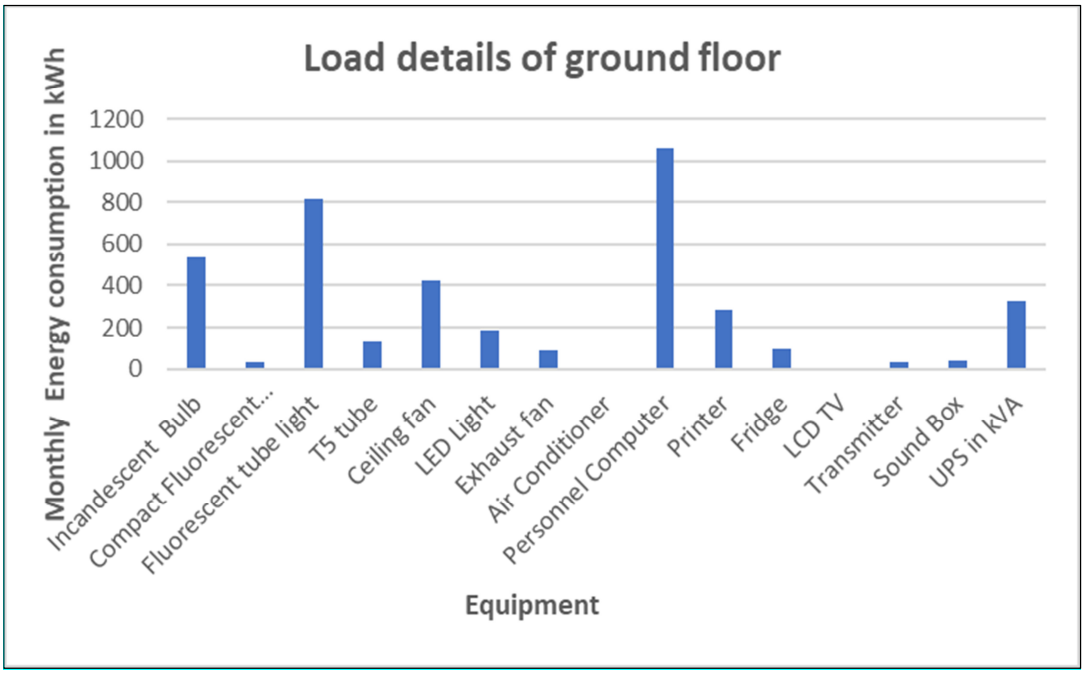
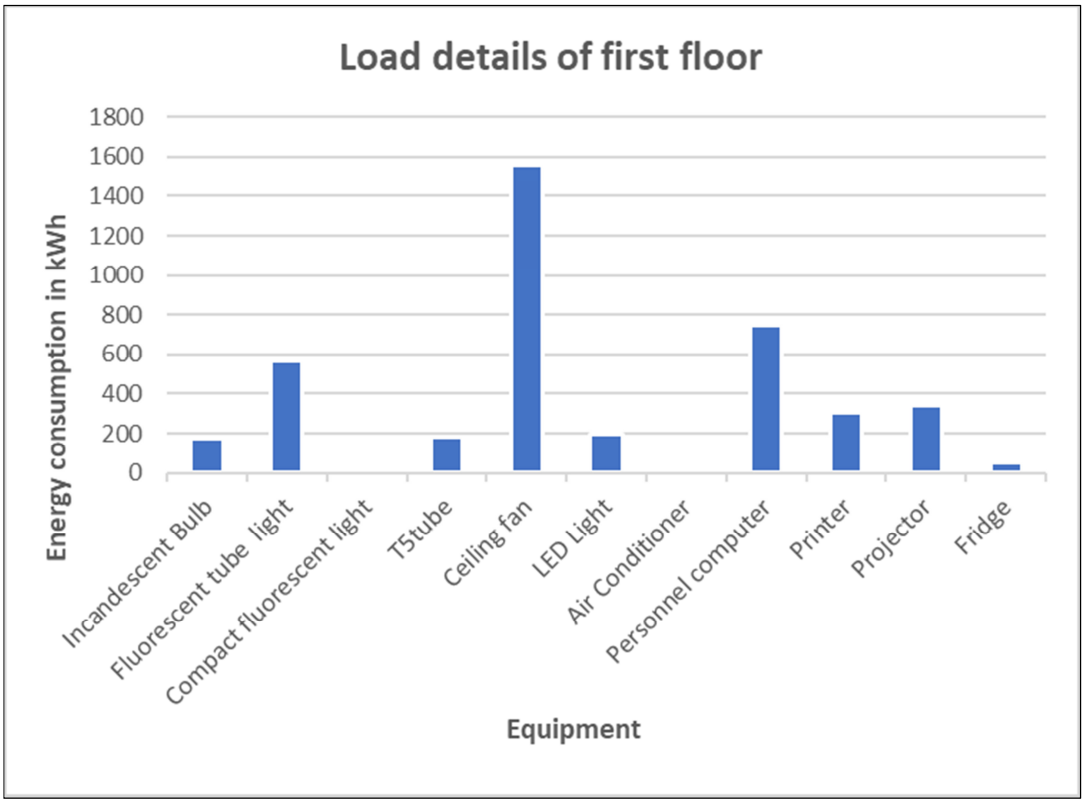

Load details of ground floor
Monthly Energy consumption in kWh
1200
1000
800
600
400
200
0
Incandescent Bulb
Compact Fluorescent...
Fluorescent tube light
T5 tube
Ceiling fan
LED Light
Exhaust fan
Air Conditioner
Personnel Computer
Printer
Fridge
LCD TV
Transmitter
Sound Box
UPS in kVA
Equipment


Load details of first floor
Energy consumption in kWh
1800
1600
1400
1200
1000
800
600
400
200
0
Incandescent Bulb
Fluorescent tube light
Compact fluorescent light
T5tube
Ceiling fan
LED Light
Air Conditioner
Personnel computer
Printer
Projector
Fridge
Equipment

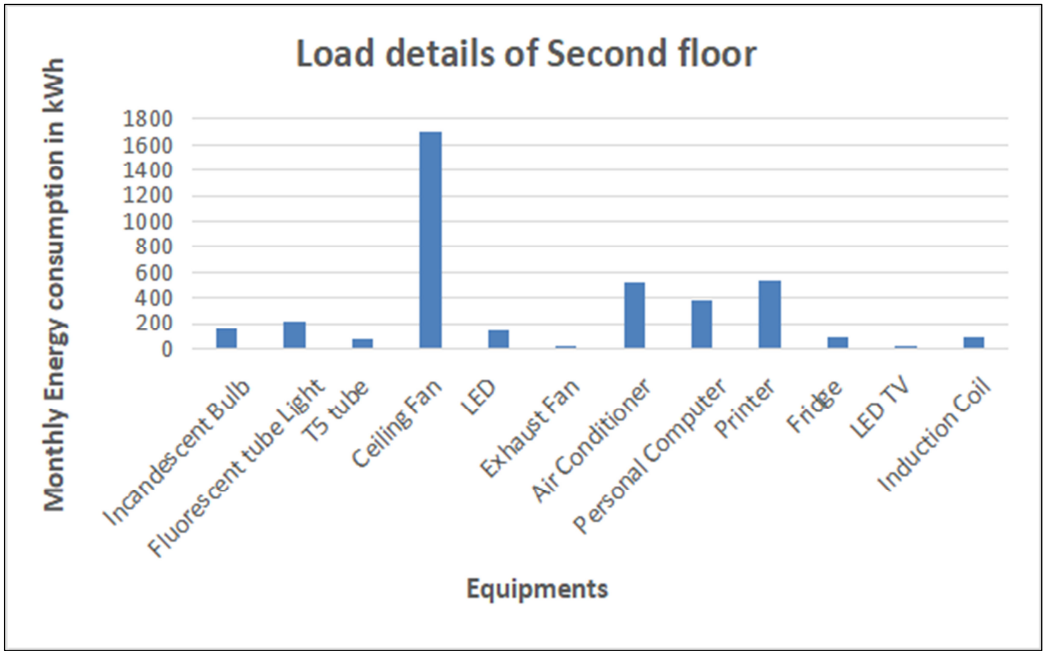
4.2 SDM MAIN BUILDING/FIRST FLOOR

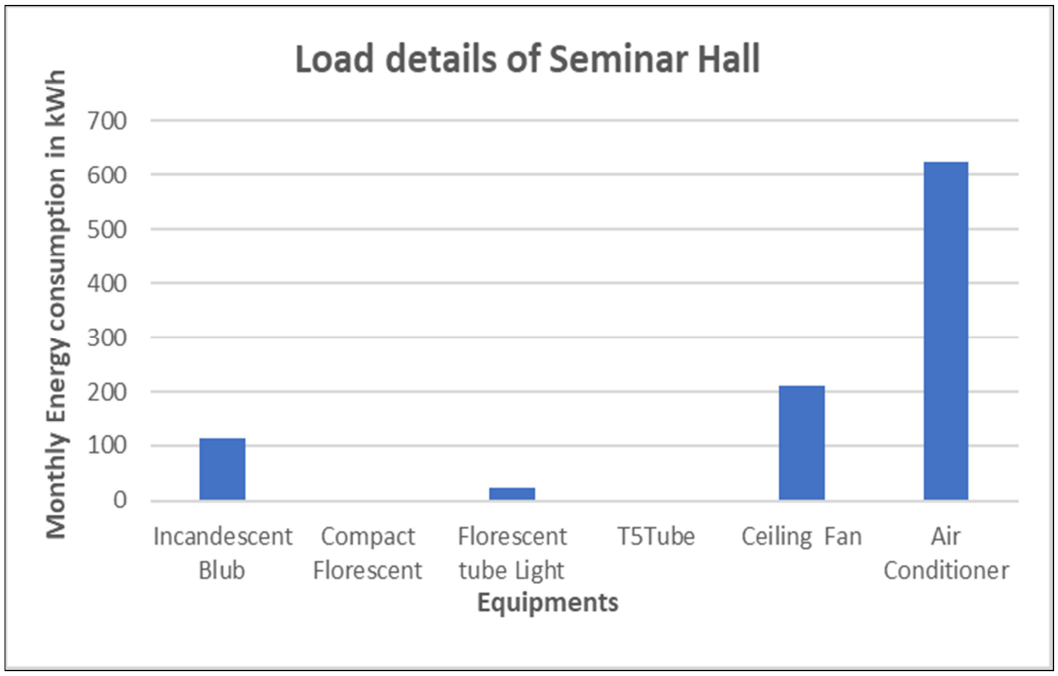
The below table shows the number of equipment and its total load connected on the 1ST floor of college campus.

Table-2 Load details of first floor

Sl. No.	Name of the equipment	Quantity	Rating of equipment(W)	Average running hour per day	Energy consumption per month(kWh)
1	Incandescent Bulb	16	60	7	174.72
2	Fluorescent tube light	78	40	7	567.84
3	Compact fluorescent light	1 5	100 9	8	2.28 9.36
4	T5 tube	1 3 3 11 13	11 28 15 20 40	8	2.28 17.47 9.225 45.76 106.6
5	Ceiling fan	110	78	7	1561.56
6	LED Light	14 3 6 4 16	20 9 11 38 36	7 7 7 7 7	50.96 4.914 12.012 27.6 104.86
7	Air Conditioner	3 5	1500 1000	8 8	936.0 1040.0
8	Personnel computer	36	200	4	748.8

9	Printer	10	300	4	303.0
10	Projector	11	300	4	343.2
11	Refrigerator	1	250	8	52.0
	Total				6,120.441





4.3 SDM MAIN BUILDING/SECOND FLOOR

The below table shows the number of equipment and its total load connected on the Second floor of the college campus.

Table -3 Load details of Second floor

SL.NO	Name of the equipment	Quantity	Rating of equipment(W)	Average running Hour per day	Energy consumption per month (kWh)
1	Incandescent Bulb	14 1	60 40	7 7	152.8 7.28.
2	Fluorescent tube light	29	40	7	211.12
3	T5 Tube	20	21	8	76.44
4	Ceiling fan	120	78	7	1703.52
5	LED Light	41	20	7	149.24
6	Exhaust Fan	3	40	7	21.84

7	Air Conditioner	1(1T) 1(1.5T)	1000 1500	8 8	208.0 312.0
8	Personal Computer	18	200	4	374.4
9	Printer	17	300	4	530.4
10	Refrigerator	3	150	8	93.6
11	LED TV	5	60	1	7.8
12	Induction Coil	2	900	2	93.6
	TOTAL				3,942.04

4.4 SEMINAR HALL

The below table shows the number of equipments and its total load connected on the Seminar Hall of the campus.

Table-4 Load details of Seminar Hall

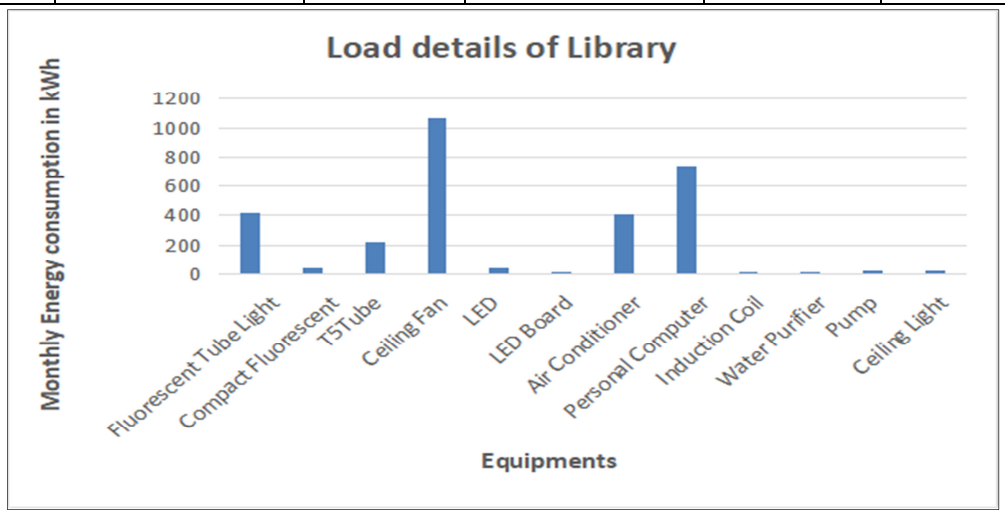
Sl no	Name of the equipment	Quantity	Rating of equipment(W)	Average running Hour per day	Energy consumption per month(kWh)
1	Incandescent Bulb	18	60	4	112.92
2	Compact fluorescent light	2	13	4	2.7
3	Fluorescent tubelight	6	40	4	24.96
4	T5 Tube	1	21	4	2.18
5	Ceiling fan	26	78	4	210.91
6	Air Conditioner	4 (1.5T)	1500	4	624.4
	TOTAL				923.07

4.5 LIBRARY

The below table shows the number of equipments and its total load connected on the library of the campus.

Table-5 Load details of Library

Sl no	Name of the equipment	Quantity	Rating of equipment(W)	Average running Hour per day	Energy consumption per month(kWh)
1	Fluorescent tube light	50	40	8	416.0
2	Compact fluorescent light	2	100	8	41.6
3	T5 Tube	51	50w	8	222.768
4	Ceiling fan	66	78	8	1070.78
5	LED Light	5 7	9 20	8 8	9.36 28.7
6	LED Display	1	5.2	2	0.270
7	Air Conditioner	2(1T)	1000	8	410.0
8	Personal Computer	18	200	8	738.0
9	Induction Coil	1	1.5	8	0.312
10	Water Purifier	1	18	8	0.312
11	Pump	1	5(kva)	2	26.0
12	Ceiling Light	6	20	8	24.96
	TOTAL				2989.062



4.6 SPECIALEQUIPMENTS/LABORATORY

The below table shows the number of equipments and its total load connected on the Laboratory of the campus.

Table-6 Load details of Laboratory

Sl no	Name of the equipment	Quantity	Rating of equipment(W)	Average running Hour per day	Energy consumption per month(kWh)
1	Oven	1	1200	8	249.6
2	Muffle Furnace	2	2500	8	1040.0
3	Centrifuge	2	250	2	26.0
4	Bunsen Burner	12	350	2	218.4
5	Lumina Airflow	1 1	2000 1200	8 8	410.0 249.6
6	Induction	1	400	8	83.2
7	Bod Incubator	1	400	8	83.2
8	Caloric Meter	10	40	8	83.2
9	Sound System Amplifier	2 1	60 100	4 4	12.12 10.1
10	Hot Air Oven	1	1500	2	78.0
11	Microscope	9	42	2	19.65
12	Amplifier	1 1 6	150 100 40	4 4 4	4.36 10.4 24.2
13	Heater	1	2	2	104.0
14	Led Focus Light	3	10	2	1.56
15	Bell	1	10	2	0.56
16	Show Light	4	40	3	12.48
17	Pedestal Fan	4	11	8	9.0
18	Water Cooler System	4	500	8	410.0

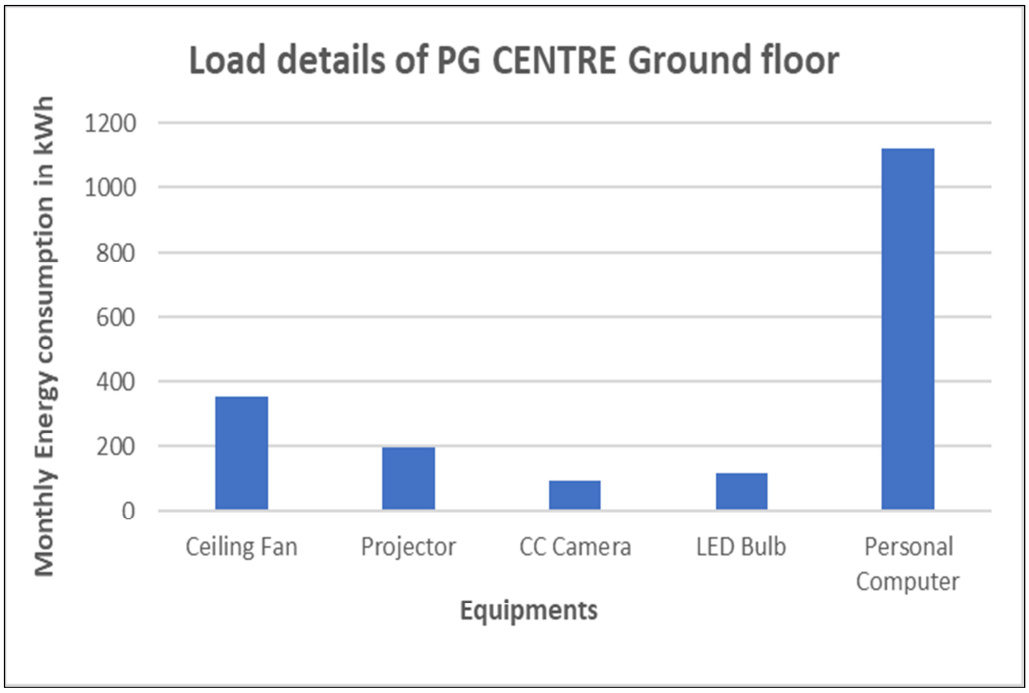
19	Wall Mount Fan	4	100	8	82.0
20	Cooler/Heater	1	500	8	104.0
	TOTAL				3325.63

4.7 PG CENTRE/ GROUND FLOOR

The below table shows the number of equipments and its total load connected on the PG CENTRE of the campus.

Table-7 Load details of PG CENTRE

Sl no	Name of the equipment	Quantity	Rating of equipment(W)	Average running Hour per day	Energy consumptionper month(kWh)
1	Ceiling Fan	44	78	4	356.92
2	Projector	5	300	5	195
3	Closed circuit Camera	3	50	24	93.6
4	LED Bulb	46	20	5	119.6
5	Personal Computer	54	200	4	1123.2
	TOTAL				1888.32

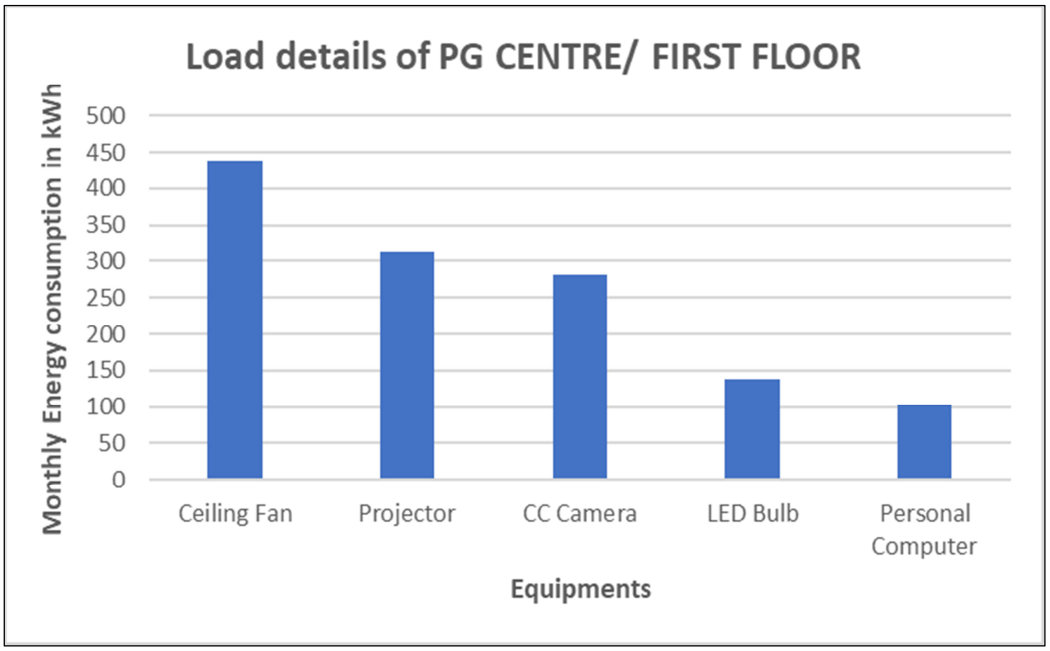


4.8 PG CENTRE/ FIRST FLOOR

The below table shows the number of equipments and its total load connected on the PG CENTRE of the campus.

Table-8 Load details of PG CENTRE/ FIRST FLOOR

Sl no	Name of the equipment	Quantity	Rating of equipment (W)	Average running Hour per day	Energy consumption per month(kWh)
1	Ceiling Fan	54	78	4	438.04
2	Projector	8	300	5	312
3	Closed Circuit Camera	9	50	24	280.8
4	LED Bulb	53	20	5	137.8
5	Personal Computer	5	200	4	104
	TOTAL				1272.64

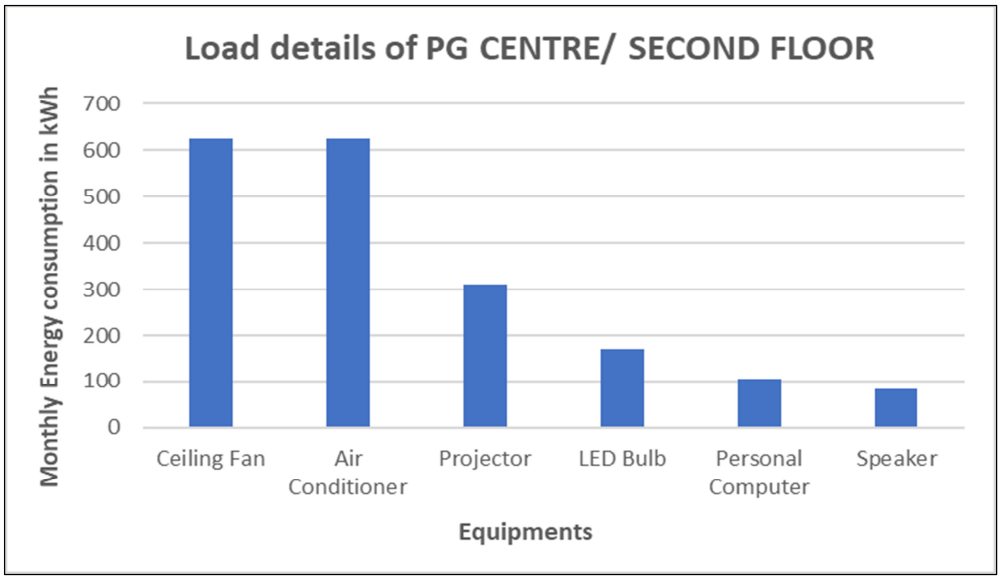


4.9 PG CENTRE/ SECOND FLOOR

The below table shows the number of equipments and its total load connected on the PG CENTRE of the campus.

Table-9 Load details of PG CENTRE/ SECOND FLOOR

Sl no	Name of the equipment	Quantity	Rating of equipment (W)	Average running Hour per day	Energy consumption per month(kWh)
1	Ceiling Fan	77	78	4	624.62
2	Air Conditioner	4	1500	4	624
3	Projector	15	300	5	312
4	LED Bulb	65	20	5	169
5	Personal Computer	5	200	4	104
6	Speaker	4	400	2	83.2
	TOTAL				1916.82

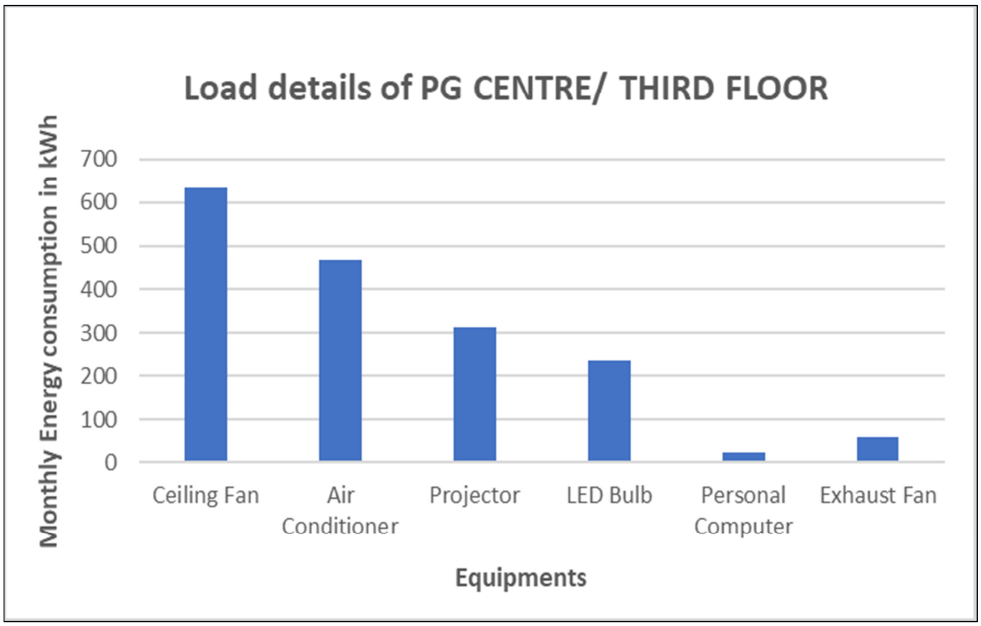


4.10 PG CENTRE/ THIRD FLOOR

The below table shows the number of equipments and its total load connected on the PG CENTRE of the campus.

Table-10 Load details of PG CENTRE/ THIRD FLOOR

Sl no	Name of the equipment	Quantity	Rating of equipment (W)	Average running Hour per day	Energy consumption per month(kWh)
1	Ceiling Fan	78	78	4	632.73
2	Air Conditioner	3	1500	4	468
3	Projector	8	300	5	312
4	LED Bulb	90	20	5	234
5	Personal Computer	1	200	4	20.8
6	Exhaust Fan	8	40	7	58.24
	TOTAL				1717.77



4.11 DHEEMANTH BOYS HOSTEL

The below table shows the number of equipments and its total load connected on the campus.

Table-11 Load details of Dheemanth boys hostel

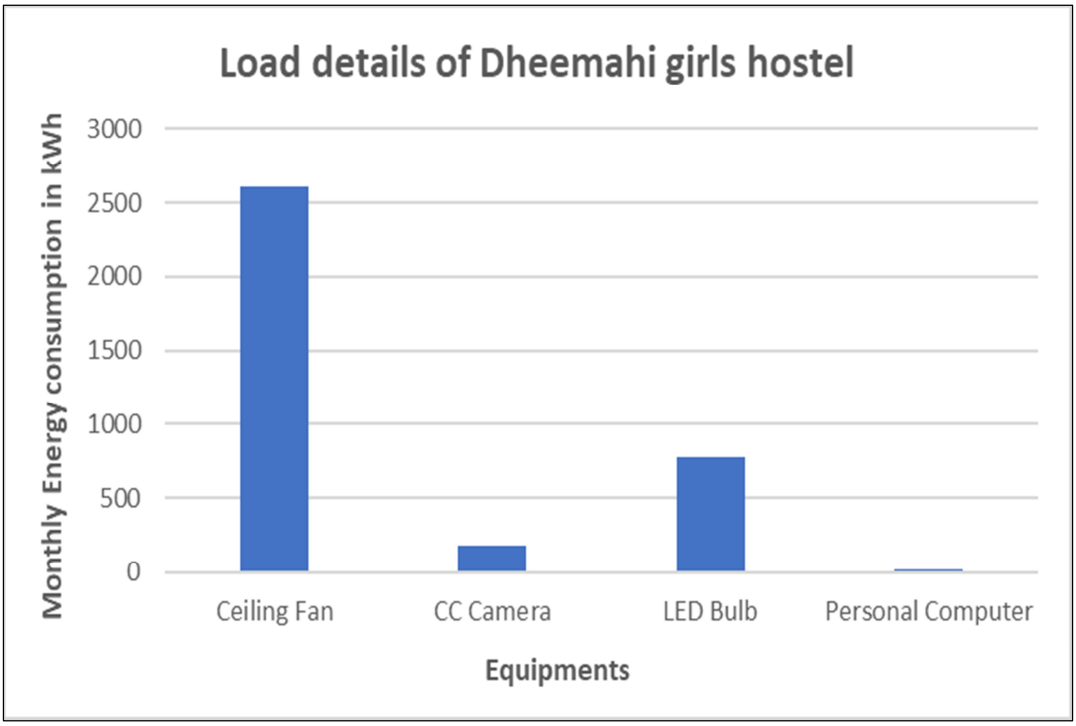
Sl no	Name of the equipment	Quantity	Rating of equipment (W)	Average running Hour per day	Energy consumption per month(kWh)
1	Ceiling Fan	344	78	4	2790.58
2	Closed Circuit Camera	18	50	24	648
3	LED Bulb	498 501	7 5	5 4	1045.8 63
4	Personal Computer	1	200	4	24
	TOTAL				4571.38

4.12DHEEMAHI GIRLS HOSTEL

The below table shows the number of equipments and its total load connected on the campus.

Table-12 Load details of Dheemahi girls hostel

Sl no	Name of the equipment	Quantity	Rating of equipment (W)	Average running Hour per day	Energy consumption per month(kWh)
1	Ceiling Fan	321	78	4	2603.95
2	Closed Circuit Camera	5	50	24	180
3	LED Bulb	495 439	7 5	5 4	519.75 263.4
4	Personal Computer	1	200	4	24
	TOTAL				3591.1

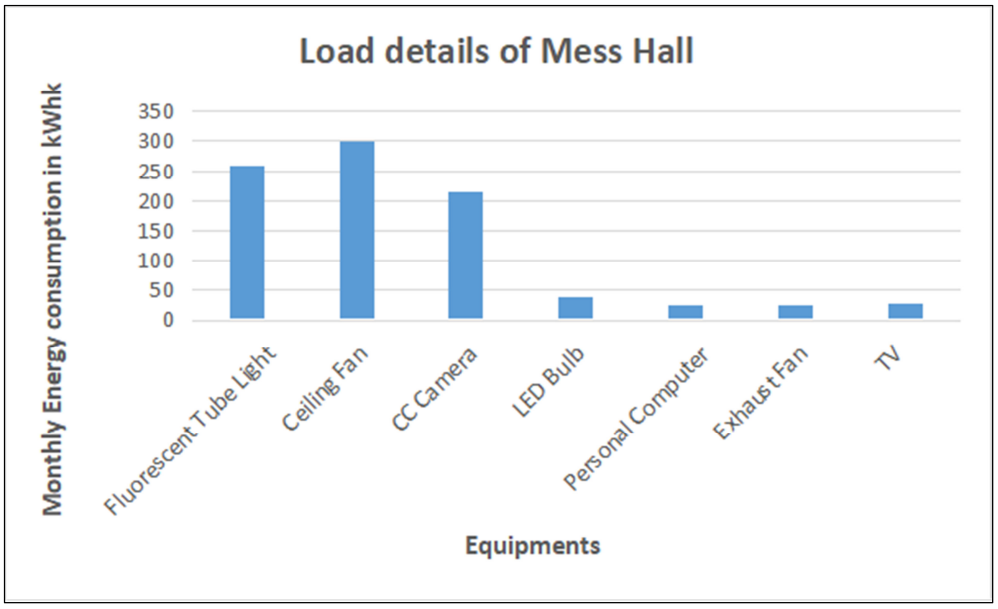


4.13MESS HALL OF HOSTELS

The below table shows the number of equipments and its total load connected on the campus.

Table- 13 Load details of Mess hall

Sl no	Name of the equipment	Quantity	Rating of equipment (W)	Average running Hour per day	Energy consumption per month(kWh)
1	Fluorescent tube Light	54	40	4	259.2
2	Ceiling Fan	37	78	4	300.14
3	Closed Circuit Camera	6	50	24	216
4	LED Bulb	36	7	5	37.8
5	Personal Computer	1	200	4	24
6	Exhaust Fan	4	40	5	24
7	TV	2	65	7	27.3
	TOTAL				888.44

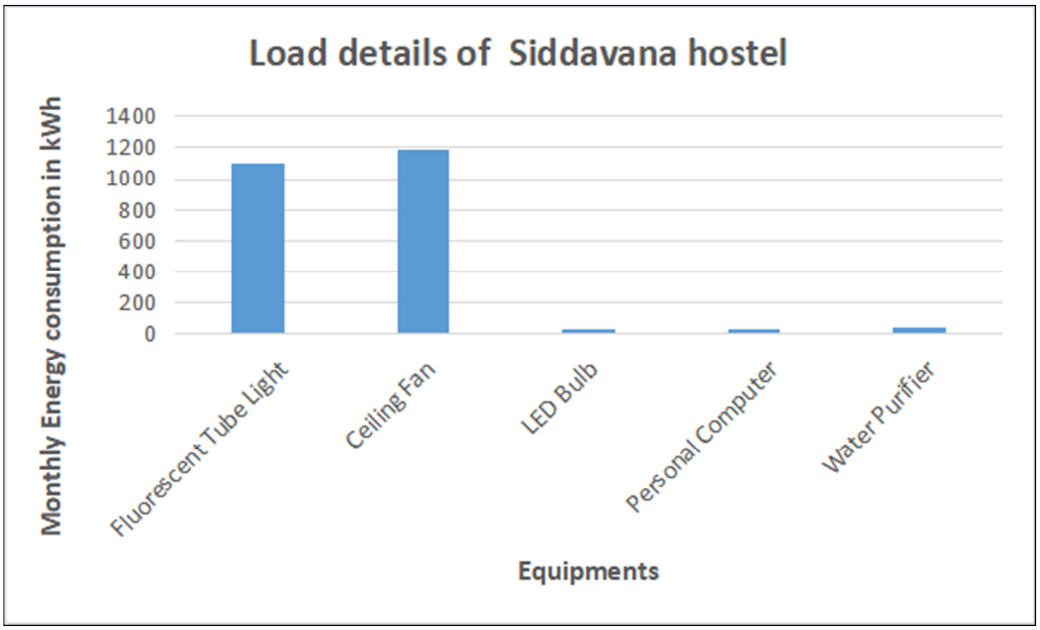


4.14 SIDDAVANA HOSTEL

The below table shows the number of equipments and its total load connected on the campus.

Table-14 Load details of Siddavana hostel

Sl no	Name of the equipment	Quantity	Rating of equipment (W)	Average running Hour per day	Energy consumption per month(kWh)
1	Fluorescent tube Light	152	60	4	1094.4
2	Ceiling Fan	146	78	4	1184.35
3	LED Bulb	9 1	18 9	5 4	24.3 0.96
4	Personal Computer	10	200	4	24
5	Water Purifier	3	18	24	38.88
	TOTAL				2367.29



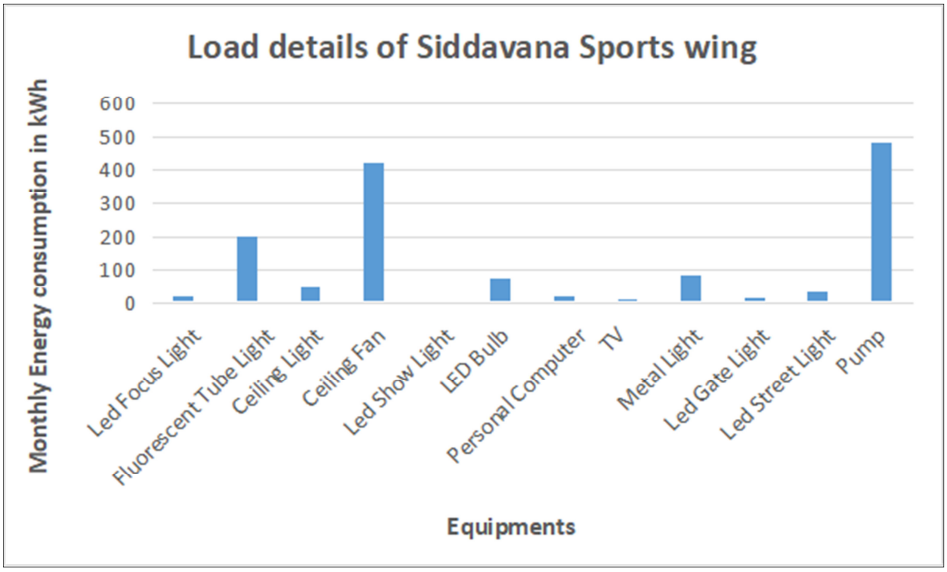
4.15 SIDDAVANA SPORTS WING

The below table shows the number of equipments and its total load connected on the campus.

Table-14 Load details of Siddavana Sports wing

Sl no	Name of the equipment	Quantity	Rating of equipment (W)	Average running Hour per day	Energy consumption per month(kWh)
1	LED Focus Light	2	100	4	20.8
2	Fluorescent tube Light	32	60	4	199.68
3	Ceiling Light	22	20	4	45.76
4	Ceiling Fan	52	78	4	421.82
5	LED Show Light	6	5	4	3.12
6	LED Bulb	32	18	5	74.88
7	Personal Computer	1	200	4	20.8
8	TV	1	65	7	11.83
9	Metal Light	1	400	8	83.2

10	LED Gate Light	4	24	7	17.47
11	LED Street Light	11	18	7	36.03
12	Pump	1	5hp	5	484.9
	TOTAL				1420.29



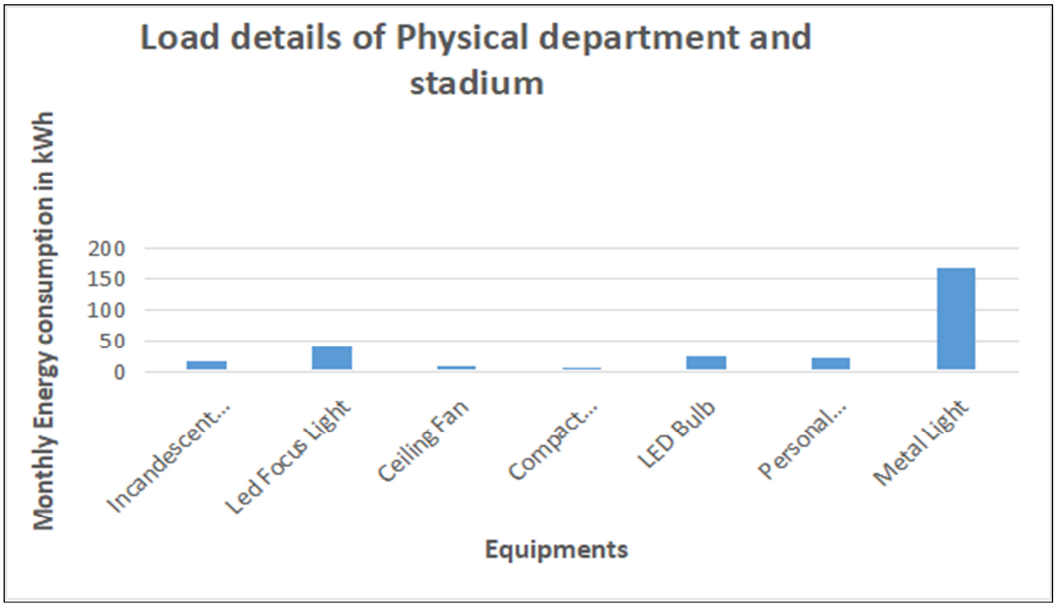
4.16 PHYSICAL DEPARTMENT AND STADIUM

The below table shows the number of equipments and its total load connected on the campus.

Table- 15 Load details of Physical department and stadium

Sl no	Name of the equipment	Quantity	Rating of equipment (W)	Average running Hour per day	Energy consumption per month(kWh)
1	Incandescent Bulb	4	40	4	16.64
2	LED Focus Light	4	100	4	41.6
3	Ceiling Fan	1	78	4	8.11
4	Compact fluorescent lamp	22	11	8	4.57
5	LED Bulb	13 4	9 20	5 4	15.21 8.32

6	Personal Computer	1	200	4	20.8
7	Metal Light	2	400	8	166.4
	TOTAL				281.61



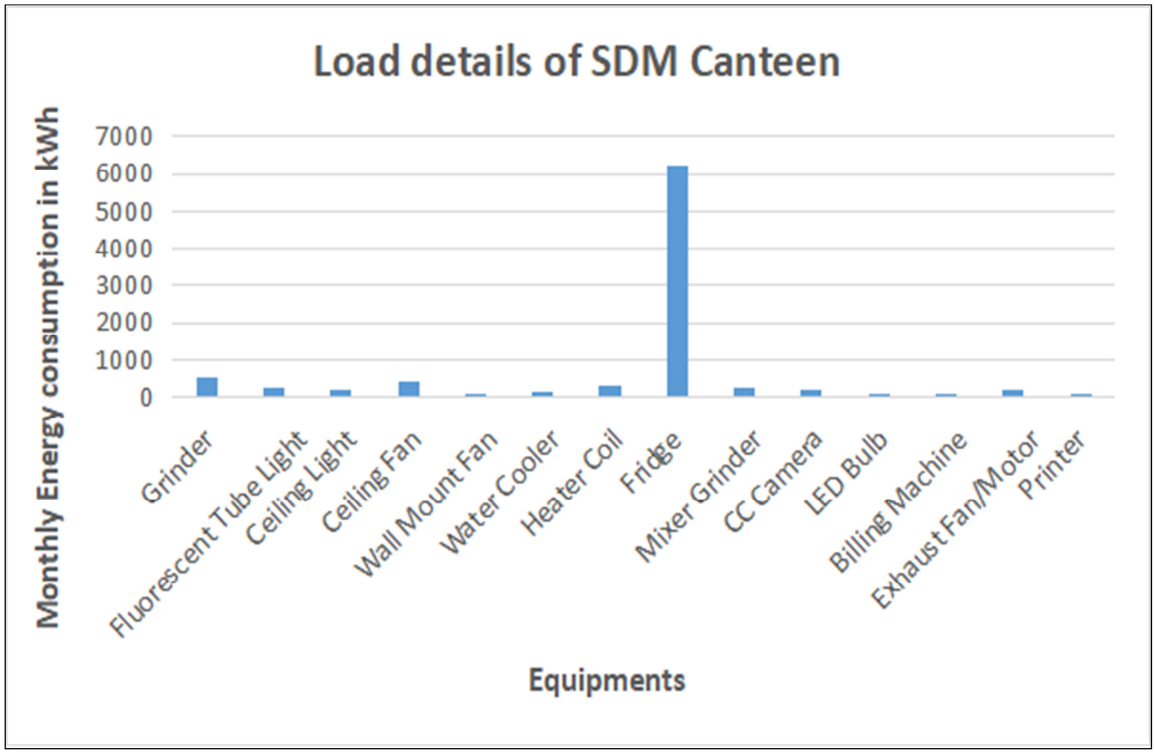
4.17 SDM CANTEEN

The below table shows the number of equipments and its total load connected on the campus.

Table-16 Load details of SDM Canteen

Sl no	Name of the equipment	Quantity	Rating of equipment (W)	Average running Hour per day	Energy consumption per Month (kWh)
1	Grinder	2 1	3hp 1hp	4	465.50 77.58
2	Fluorescent tube Light	54	40	4	224.64
3	Ceiling Light	16	50	10	208
4	Ceiling Fan	20	78	10	405.6
5	Wall Mount Fan	1	60	4	6.76

6	Water Cooler	1	1hp	8	155.16
7	Heater Coil	1 1	1kw 2kw	10	260 52
8	Fridge	2	5kw	24	6240
9	Mixer Grinder	2 1	750 500	5	195 65
10	Closed Circuit Camera	6	50	24	187.2
11	LED Bulb	26 11 22	9 20 5	5	30.42 28.6 14.3
12	Billing Machine	1	40	10	10.4
13	Exhaust Fan/Motor	1 1	746 746	5 5	96.98 96.98
14	Printer	1	60	7	10.92
	TOTAL				8831.04

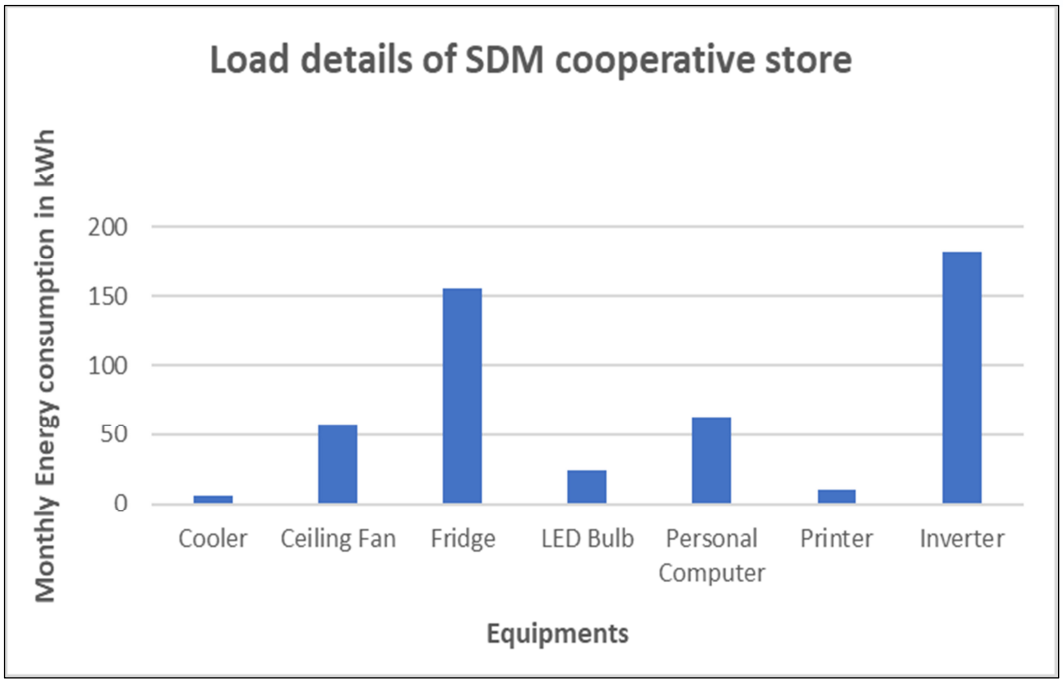


4.18 SDM COOPERATIVE STORE

The below table shows the number of equipments and its total load connected on the campus.

Table - 17 Load details of SDM cooperative store

Sl no	Name of the equipment	Quantity	Rating of equipment (W)	Average running Hour per day	Energy consumption per month(kWh)
1	Cooler	1	60	4	6.24
2	Ceiling Fan	7	78	4	56.78
3	Refrigerator	4	300	5	156
4	LED Bulb	4 5 9	20 5 9	5 5 5	10.4 3.25 10.53
5	Personal computer	3	200	4	62.4
6	Printer	2	40	5	10.4
7	Inverter	1	1KW	7	182
	TOTAL				498



CONSOLIDATED ENERGY CONSUMPTION TABLE

Sl.No	Item	No. Of items	Power rating	Working hours per day	Monthly consumption in kWh
1	Incandescent Bulbs	102	60W	7	1071
2	Fluorescent tube light	567	40W	7	3969
3	Ceiling Fan	1533	78W	8	23914.8
4	T-5 Tube Light	133	28W	7	651.7
5	Compact Fluorescent Lamp	22	20W	7	77
6	LED lamp	2489	20W	7	8711.5
7	Exhaust Fan	29	50W	4	145
8	Air conditioner 1 T	14	1kW	5	1750
	Air conditioner 1.5T	22	1.94kW	5	5335
9	Personal computer	206	200W	5	5150
10	Printer	38	50W	3	142.5
11	LCD Projector	37	282W	5	1304.25
12	Refrigerator	15	500W	24	4500
13	Scanner	2	25W	4	5
14	Focus light	6	1kW	2	300
15	Halogen Light	2	1kW	7	420
16	LED TV	8	80W	7	112
17	Transmitter	1	50W	24	36
18	Sound box	4	100W	4	40
19	Single phase pump	2	746W	2	74.6
20	Three phase pump	2	2.2kW	3	335.7

21	Induction coil	2	900W	2	90
		1	1.5kW	2	24
22	Pedestal Fan	6	60W	4	36
23	Water Purifier	6	60W	24	216
24	Heater	3	1.5 kW	4	450
25	Oven	1	1.2kW	8	240
26	Grinder	3	1kW	4	300
27	Street light	11	100W	10	275
28	Amplifier	8	60W	4	48
29	Microscope	9	42W	9	85.05
30	Bell	3	100W	1	7.5
31	LED focus light	3	100W	3	22.5
32	Photocopy machine	1	183W	7	32.025
33	Show light	4	40W	6	24
34	Muffle Furnace	2	2.5kW	8	1000
35	Centrifuge	2	250W	2	25
36	Incubator	1	400W	8	80
37	Induction stove	1	2kW	8	16
38	Laminar air flow	1	250W	8	50
39	CC camera	53	50W	24	1590
	Total				62656.12

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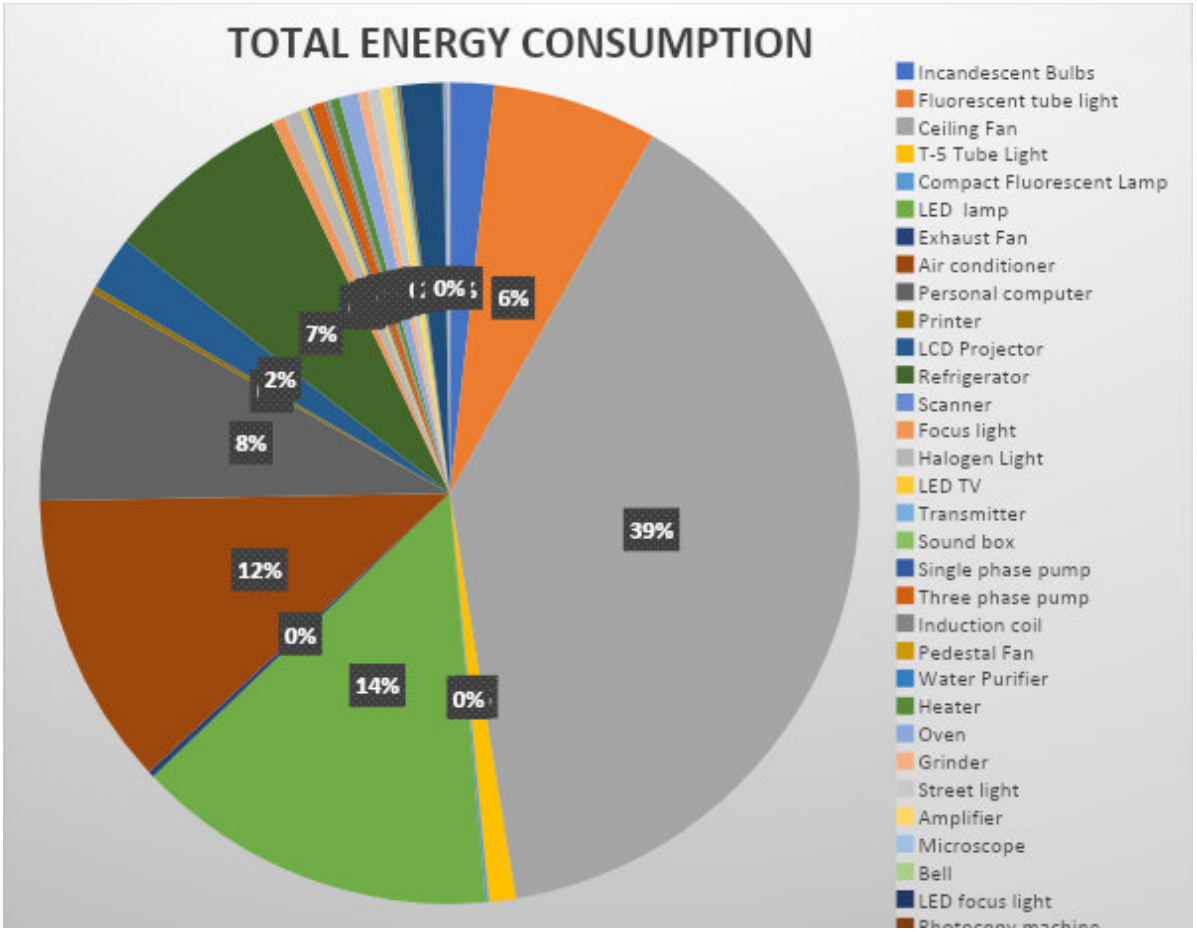

From the above pie chart, it is observed that the energy saving potential is there in replacement of conventional lighting and ordinary fans with energy efficient ones. The detialed floor wise energy saving measure for borth cases is shown in below tables.

ENERGY SAVING MEASURES

REPLACEMENT OF CONVENTIONAL LIGHTING SYSTEM INTO LED

AREA	QTY	LIGHT TYPE		WATT	OP (hr)	MONTHLY kWh	CHANGE	NEW WATTAGE	NEW kWh	SAVING kWh	SAVING Rs	UNIT PRICE (For LED)	INVESTMENT	PAYBACK (In months)
SDM MAIN BUILDING GROUND FLOOR		49	INCBULB	60	7	535.08	18W LED Tubelight	18	160.524	374.556	3015.17	200	9800	3

	112	FLTUBE	40	7	815.3	18W LED Tubelight	18	366.912	448.38	3609.52	200	22400	50
SDM MAIN BUILDING FIRST FLOOR	16	INCBULB	60	7	174.72	18W LED Tubelight	18	52.41	122.36	1346.28	200	3200	19
	78	FLTUBE	40	7	567.84	18W LED Tubelight	18	255.52	312.32	2514.17	200	15600	29
SDM MAIN BUILDING SECOND FLOOR	14	INCBULB	60	7	152.8	18W LED Tubelight	18	45.86	106.94	860.86	200	2800	3
	1		40	7	7.28	18W LED Tubelight	18	3.27	4.01	32.28	200	200	6

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	29	FLTUBE	40	7	211.12	18W LED Tubelight	18	95	116.12	934.76	200	5800	6
SEMINAR HALL	18	INCBULB	60	4	112.32	18W LED Tubelight	18	33.69	78.63	632.97	200	3600	6
	6	FLTUBE	40	4	24.96	18W LED Tubelight	18	11.23	13.73	110.52	200	1200	11
LIBRARY	50	FLTUBE	40	8	416	18W LED Tubelight	18	187.2	228.8	1841.84	200	10000	5
PHYSICAL DEPT	4	INC	40	4	16.64	18W LED	18	7.48	9.16	73.73	200	800	11

AND STADIUM		B U L B				Tubelight							

Total no.of Light fittings = 669 Nos
Total no.of presently operated = 669 Nos
Total no.of Light fittings to be replaced = 669Nos
Present energy consumption = 4870.32 kWh
Expected energy consumption = 2191.64
Total energy saved per month = 2678.67
Total monthly cost savings = 21563.29 Rs
Investment = 133800 Rs
Payback period = 6.20

ENERGY SAVING MEASURES

REPLACE PRESENT CEILING FAN CONSUMING 78W WITH ENERGY EFFICIENT FANS CONSUMING 40W

AREA	QTY	FAN	WATT	OP (hr)	MONTHLY kWh	CHANGE	NEW WATTAGE	NEW kWh	SAVING (kWh)	SAVING (Rs)	UNIT PRICE (For BLDC FAN) (Rs)	INVESTMENT (Rs)	PAYBACK (In months)
SDM MAIN BUILDING GROUND FLOOR	30	CEILING FAN	78	7	425.88	28W BLDC FAN	28	152.88	273	2197.65	3250	97500	44
SDM MAIN BUILDING FIRST FLOOR	110	CEILING FAN	78	7	1561.56	28W BLDC FAN	28	560.56	1001	8058.05	3250	357500	44
SDM MAIN BUILDING	120	CEILING FAN	78	7	1703.52	28W BLDC FAN	28	611.52	1092	8790.6	3250	394000	45

SECOND FLOOR													
SEMINAR HALL	26	CEILING FAN	78	4	210.91	28W BLDC FAN	28	75.71	135.2	1088.36	3250	84500	78
LIBRARY	66	CEILING FAN	78	8	1070.78	28W BLDC FAN	28	384.38	686.4	5525.52	3250	214500	39
PG CENTRE GROUND FLOOR	44	CEILING FAN	78	7	624.62	28W BLDC FAN	28	224.22	400.4	3223.22	3250	143000	44
PG CENTRE FIRST FLOOR	54	CEILING FAN	78	7	766.584	28W BLDC FAN	28	275.18	491.4	3955.77	3250	175500	44
PG CENTRE SECOND FLOOR	77	CEILING FAN	78	7	1093.09	28W BLDC FAN	28	392.39	700.7	5640.63	3250	250250	44
PG CENTRE THIRD FLOOR	78	CEILING FAN	78	7	1107.28	28W BLDC FAN	28	397.48	709.8	5713.89	3250	253500	44
DHEEMANTH BOYS HOSTEL	344	CEILING FAN	78	12	9659.52	28W BLDC FAN	28	3467.52	6192	49845.6	3250	1118000	22
DHEEMAHI GIRLS HOSTEL	321	CEILING FAN	78	12	9013.68	28W BLDC FAN	28	3235.68	5778	46512.9	3250	1043250	22
MESS HALL OF HOSTELS	37	CEILING FAN	78	4	346.32	28W BLDC FAN	28	124.32	222	1787.1	3250	120250	67
SIDDAVANA HOSTEL	146	CEILING FAN	78	12	4099.68	28W BLDC FAN	28	1471.68	2628	21155.4	3250	45500	2

SIDDAVANA SPORTS WING	52	CEILING FAN	78	7	851.76	28W BLDC FAN	28	305.76	546	4395.3	3250	169000	38
PHYSICAL DEPT AND STADIUM	1	CEILING FAN	78	4	8.11	28W BLDC FAN	28	2.91	5.2	41.86	3250	3250	78
SDM CANTEEN	20	CEILING FAN	78	10	405.6	28W BLDC FAN	28	145.6	260	2093	3250	65000	31
SDM COOPERATIVE STORE	7	CEILING FAN	78	4	56.78	28W BLDC FAN	28	20.38	36.4	293.02	3250	22750	78

Total no.of Fan fittings = 1533 Nos
Total no.of presently operated = 1533 Nos
Total no.of Fan fittings to be replaced = 1533 Nos
Present energy consumption = 21762.46 kWh
Expected energy consumption = 7812.16 kWh
Total energy saved per month = 13950.29
Total monthly cost savings = 112299.83 Rs
Investment = 4982250 Rs
Payback period = 44.36 months

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5. FINDING AND SUGGESTIONS

From the audit the power consumption of various equipment present in the college campus is obtained. It is observed that the energy savings in essential equipment may be done by properly operating them and shutting down when it is not in use. The awareness about energy saving needs to be given to the users of each equipment so that it will save the energy. The energy savings may be done by replacing the existing conventional lights with LED lights and ordinary ceiling fans with BLDC fans. The observations and the suggestions from the audit are as follows.

1. Annual maintenance contract (AMC) of UPS and batteries situated in ground floor needs to be renewed every year.
2. The socket situated in second floor near the water cooler to be replaced with new one as its indicator is not working properly.
3. Overloading of plug socket by using extension chord in sports room of the stadium may be avoided.
4. Termination of unused wires to be made by proper lugging.
5. Panel at the water pumping to be properly closed after switching on the pump.
6. After use each equipments needs to be turned off properly.
7. The potential saving of energy is possible in replacement of ordinary ceiling fan of 78 W with Brushless DC fan of 28W and replacing ordinary fluorescent light of 40W with LED light of 18W.
8. Annual maintenance contract (AMC) of Air Conditioners and water purifiers situated in various labs and floors needs to be renewed every year.

END OF REPORT

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Shri Dharmasthala Manjunatheshwara Educational Society's

SDM INSTITUTE OF TECHNOLOGY

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Sri Dharmasthala Manjunatheshwara College
(Autonomous), Ujire-574 240, Dakshina Kannada, Karnataka State
(Re-accredited by NAAC at "A" grade with CGPA 3.61 out of 4)

Date: 27/11/2021

CERTIFICATE

This is to certify that the Simple Electrical Energy Audit of Shree Dharmasthala Manjunatheshwara College (Autonomous), Ujire, has been carried out by Assistant Professors Dr. Subrahmanya Bhat and Mr. Santhosh Kumar P N, Department of Electrical and Electronics Engineering, SDM Institute of Technology, Ujire, for the year 2021. The possible energy savings are suggested in the report dated 27/11/2021.

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