ENERGY AUDIT REPORT

(2022-2023)

ENERGYAUDIT REPORT

எம்.வி.முத்தையா அரசு மகளிர் கலைக்கல்லூரி
M.V. Muthiah Government Arts College for Women
(Affiliated to Mother Teresa Women's University, Kodaikanal)
Re-accredited with 'A' Grade by NAAC
Dindigul - 624001, Tamilnadu

2022-2023

Energy Audit Report

BY

Head of the Department

Department of Physics

M.V. Muthiah Government Arts College for Women, Dindigul-624 001

SUBMITTED

TO

The Principal

M.V. Muthiah Government Arts College for Women, Dindigul-624 001

SUBMITTED

BY

Energy Audit Expert Team

Dr. Mrs.R.Vallaiammal

Associate Professo & Head, PG Department of Physics

Arulmigu Palaniandavar Arts College for Women, P.K. Puthuur (PO), Palani-624615

Dr.Mrs.A.Jacquiline Regina Mary

Associate Professor & Head, Department of Physics

Jayaraj Annapackiam College for Women, Periyakulam-625

Preface

Data collection for energy audit of the M.V.Muthiah Government Arts College for Women, Dindigul. Campus was conceded by team for the period of 2022 to 2023. This audit was over sighted to inquire about convenience to progress the energy competence of the campus. To drop of energy utilization whilst cultivate or humanizing comfort, health and safety were of prime anxiety. This audit require editor recognize the mainly energy proficient appliances. Besides, several each day processes concerning common appliances have been provided which facilitate sinking the energy expenditure. The energy audit survey was completed by Department of Physics. Data was collected from each classroom, laboratory & every room. The work is completed by considering, how many tubes, fans, A.Cs, electronic instruments, etc are available in each room, and how much was participation of each component in total electricity consumption

Acknowledgement

Dr.R.Rajammal, Associate Professor & Head, Department of Physics, M.V.Muthiah Government Arts College for Women, Dindigul, is very much thankful to Principal **Dr.D.LAKSHMI** for motivating us to conduct the energy audit and also grateful to all Heads of the Department, Hostel Deputy Warden, Bursar, Superintendent and all office staff members. We express our sincere gratitude to **Dr.M.Ramesh**, Assistant Professor, Department of Physics for providing necessary guidance in making the audit a success.

About the College

M.V.Muthiah Government Arts College for Women, Dindigul is one of the largest Government Institutions for women in Tamil Nadu. The College was established in June 1966 with a mission to empower rural women through higher education. Forty acres of land was donated by Thiru. M.V.Muthiah Pillai the then founder of Angu Vilas Groups for the construction of the college. The college was named "M.V.Muthiah Government Arts College for Women" to honour the donator's lion's share in providing land and building construction. Since its inception in 1966, the Institution enjoys a commendable social accreditation and every year we receive thousands of applications for getting admission into each course. As the institution strictly adheres to the mission of "Purity, Unity and Ability", Parents prefer to admit their wards in our college rather than other colleges in the district. In 1972 and in 1974 the then Chief Minister of TamilNadu Dr.M.Karunanidhi laid the foundation stone for hostel buildings. From 1975 onwards the college started functioning in the new campus. National Service Scheme and the Corporation of Population Education Programme were started in 1975 to render great service to the society. Under the Twenty Points, a Co-operative store for staff and students and a common canteen work successfully completed in the campus. Within a short span of fourteen years the college spread its roots strongly and added one more feather to its cap by attaining Grade I Status. As the college maintains a good discipline, many families in the villages nearby are able to give higher education to their girls breaking all orthodox social taboos.

Alumni association of the college is one of the largest bodies among the alumni associations of various colleges in South TamilNadu. It works as a beacon light to its successors in the Alma mater. The college has a good hostel facility for students. The college is affiliated to Mother Teresa Women's University, the only women's University in Tamil Nadu and the students are evaluated by semester exams. Project is introduced for P.G Students in their final semester.

The College which was started in 1966 is a multi-disciplinary institution offering diverse courses. Tamil and English as medium of instruction, various Arts and Science degree Courses are offered by this college. The college has thirteen under graduate courses, eleven post graduate courses and 6 M.Phil. The departments of Tamil, English, Computer Science and Geography, Mathematics have emerged as research departments.

The college has 63 permanent staff members including the Principal and 75 Guest lecturers in both I & II shifts. The college provides higher education to 2690 students in the current academic year. The college has a well equipped library. 26010 books are available in the general library and the individual departments have 17409 books in their libraries for the maximum utility of students. Allotments have been given by the government for the construction of new buildings. The Principal and staff members take the institution in the path of excellence successfully. Thousands of rural and downtrodden students enjoy the facilities provided by the college to a fuller extent

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Introduction:

A nation is tiring to advance in quantity and quality to the spread of education among the common India and development of their intelligence. In India the entire field of education and other fields of intelligent activities had been monopolized by a handful of men before independence. But today we are marching towards the desirable status of a developed nation with fast strides. But the development should be a sustaine done. For achieving such an interminable development energy management is essential. As far as concerning electricity crisis, we are facing lack of electricity during office work. So, institutional management is taking design regarding production of electricity and saving electricity for eco-social aspect.

The country has motivated strategy to enlarge its renewable energy resources and policy to establish the nuclear power plants. India's industrial demand accounted for 35% of electrical power requirement, domestic household use accounted for 28%, agriculture 21%, commercial 9%, and public lighting and other miscellaneous applications accounted for the rest. Energy conservation means reduction in energy consumption without making any sacrifice of quantity or quality.

A successful energy management program begins with energy conservation; it will lead to adequate rating of equipments, using high efficiency equipment and change of habits which causes enormous wastages of energy. It is necessary to plant being self-sufficient in electricity requirement.

In the present study college electricity audit has been done. Practical laboratory, instrument, Fans, air conditioners, Computer set care considered in this study. We have studied total budget of the college, total economic investment of college on the electricity and total electricity generation from the solar electricity generation unit. Also, we have studied total saving of electricity and money from solar electricity generation and requirement of solar energy. Also, it is studied about exact contribution of bulb, fans, computer, instruments etc in the total requirement of electricity. We studied all the mentioned things by collecting exactly data from the survey.

Objectives:

To find out the electric power consumption of our college

Methodology:

Data was collected manually by the Department of Physics

Experimental and data collection:

All the required was data collected by the Department of Physics. All over the college, energy audit was held and the following information was gathered.

Equipment functional in the College (Department wise)

A. Department of Physics

S.No	Name Of The Instruments	Model & Make	Year Of Purchase	Status
1	Diode Laser	Pico	2018-19	Working
2	Four Probe Apparatus	Pico	2018-19	Working
3	Hall Effect Setup	Pico	2018-19	Working
4	Constant Current Power Supply	Pico	2018-19	Working
5	Digital Gauss Meter	Ses-Dgm-102	2018-19	Working
6	Solar Constant Experiment Full Set Up	Esel	2018-19	Working
7	Solar Cell Characteristic Apparatus	Esel	2018-19	Working
8	Electromagnet Emu 50v	Ses	2019-20	Working
9	Precision Balance	Kinglab-Sab303e	2020-21	Working

B. Department of Chemistry

S.No	Instruments	Make & Model	Quantity	Year of Purchase	Status
1.	Vacuum pump JABIVAK make with ½ HP motor & essential accessories	PRAVBIVAC	2	19.06.2013	Working
2.	Hot Air Oven	KEMI K05-3 Chamber	2	09.03.2011	Working
3.	Digital Balance	Shimadzu 0.0001gm	1	10.03.2011	Working
			1	14.03.2011	Working
			1	18.03.2011	Working
			1	29.02.2012	Working
4.	Sharp Multi-functional Device	SHARP AR5620N	1	12.02.2014	Working
5.	Analytical Balance Digital	SHIMADZU 200gm Capacity	1	05.03.2016	Working
8	Digital Balance (220 gm)	WENSAR	1	05.03.2021	Working
9	Ice Maker	KLDIM-150	1	05.03.2021	Working
10	Rotary Shaker	LAB TECH with timer & speed meter	1	05.03.2016	Working

C. Department of Zoology

S.No	Make and Model	Year	Status
1	Students compound microscope (Weswox)	31.12.2018	Working
2	Students Compound microscope(Olympus)	31.12.2018	Working
3	B P. Apparatus	10.03.2018	Working
4	P^H meter with Glass electrode and stand	15.102018	Working
5	Dissection microscope	15.12. 2018	Working
6	Heamocytometer	23.03.2017	Working
7	Digital Thermometer	23.03.2017	Working
8	Photo electric calorimeter	27.03.2012	Working
9	Electrical single pan balance	29.04.2008	Working
10	Heamoglobinometer	12.03.1998	Working
11	Stereo Binocular Microscope	08.04.1998	Working
12	Overhead projector w/oscreen	11.05.1995	Working
13	Magnetic stirrer	11.04.2014	Working
14	Electrical centrifuge	02.02.2014	Working
15	Laminar Air Flow	02.02.2014	Working
16	Orbital shaking Incubator	10.04.2014	Working
17	Spectrophotometer	27.03.2012	Working
18	Glucometer	27.03.2012	Working
19	Photo Copier	14.02.2012	Working
20	Autoclave vertical portable model	08.04.2011	Working
21	Computer	29.03.2011	Working
22	Printer (Laserjet)	25.03.2011	Working
23	LCD Projector	31.03.2011	Working
24	Generator		Working
25	Hot air oven	2019-20	Working
26	Labtec Model Incubator – Temperature and Fan Control	2019-20	Working
27	Digital Photo Colorimeter (Deep vision make-1318 model)	2019-20	Working
28	Induction stove (Pigeon -1800W)	2019-20	Working
29	Almicro Digital vedio microscope	2020-2021	Working

D. Department of Botany

S.No	Name Of The Instruments	Year	Status
1	PH meter	2017	Working
2	Calorimeter	2017	Working
3	Diigital Balance	2017	Working
4	Gel electrophoresis	2018	Working
5	Laminar air flow & Culture rack	2019	Working

YEARLY POWER CONSUMPTION OF THE COLLEGE SERVICES AS PER TAMILNADU ELECTRICITY BOARD

Bill analysis was done for all the services of the college. Service number 204-004-2561 belongs to the hostel electricity bill, which contains no data. Because in the duration 2022-2023, hostel was not runed at that time. The detailed report of the bill analysis was given below.

MONTHS	SERVICE NUMBER 709			
	CURRENT READING	USAGE CONSUMPTION AMOUNT	CC CHARGE	AMOUNT TO BE PAID
JULY	43030	2700	16,725	Rs 16,734
AUGUST	44680	7650	11711	
SEPTEMBER	NIL	NIL	NIL	NIL
OCTOBER	NIL	NIL	NIL	NIL
NOVEMBER	45690	1010	10,697	
DECEMBER	NIL	NIL	NIL	NIL
JANUARY	47310	1629	15,608	
FEBRUARY	NIL	NIL	NIL	NIL
MARCH	49410	2100	19640	
APRIL	NIL	NIL	NIL	NIL
MAY	51170	1760	16781	
JUNE	NIL	NIL	NIL	NIL
JULY	53203	2033	19324	

MONTHS	SERVICE NUMBER 708			
	CURRENT READING	USAGE CONSUMPTION AMOUNT	CC CHARGE	AMOUNT TO BE PAID
JULY	2141	NIL	960	960
AUGUST	NIL	NIL	NIL	NIL
SEPTEMBER	2141	NIL	1189	1189
OCTOBER	NIL	NIL	NIL	NIL
NOVEMBER	0	DF	1684	1684
DECEMBER	NIL	NIL	NIL	NIL
JANUARY	75511	0	6600	6600
FEBRUARY	NIL	NIL	NIL	NIL
MARCH	75511	0	1600	1600
APRIL	NIL	NIL	NIL	NIL
MAY	75511	0	1600	1600

MONTHS	SERVICE NUMBER 3003			
	CURRENT READING	USAGE CONSUMPTION AMOUNT	CC CHARGE	AMOUNT TO BE PAID
JULY	51100	280	7275	59449
AUGUST	NIL	NIL	NIL	NIL
SEPTEMBER	51340	240	3992	63226
OCTOBER	NIL	NIL	NIL	NIL
NOVEMBER	51470	130	4292	66971
DECEMBER	NIL	NIL	NIL	NIL
JANUARY	51980	510	7484	44340
FEBRUARY	NIL	NIL	NIL	NIL
MARCH	52650	670	8828	
APRIL	NIL	NIL	NIL	NIL
MAY	53030	380	6392	59560

MONTHS	SERVICE NUMBER 256			
	CURRENT READING	USAGE CONSUMPTION AMOUNT	CC CHARGE	AMOUNT TO BE PAID
JULY	322410	13870	71598	
AUGUST	NIL	NIL	NIL	NIL
SEPTEMBER	323210	800	105545	
OCTOBER	NIL	NIL	NIL	NIL
NOVEMBER	325760	310	7604	137360
DECEMBER	NIL	NIL	NIL	NIL
JANUARY	326540	377880	11552	67494
FEBRUARY	NIL	NIL	NIL	NIL
MARCH	326700	160	6344	
APRIL	NIL	NIL	NIL	NIL
MAY	326780	80	5672	

MONTIIS	SERVICE NUMBER 2560			
	CURRENT READING	USAGE CONSUMPTION AMOUNT	CC CHARGE	AMOUNT TO BE PAID
JUNE	2071.74	2180.66	5705.1	36713
JULY	2206.02	232556	4028.4	27248
AUGUST	2420.72	2551.73	6441	40776
SEPTEMBER	2671.41	2812.02	7520.7	67493
OCTOBER	2869.46	3018.87	5741.5	69588
NOVEMBER	3110.07	3270.74	7218.3	79809
DECEMBER	3261.14	343498	4532.1	57245
JANUARY	33990.61	3582.19	4154.1	54498
FEBRUARY	3586.1	3778.86	5594.7	66576
MARCH	3793.6	3995.29	6225	75534
APRIL	4038.88	4250.06	7358.4	98258
MAY	4153.18	4373.99	3429	49929

2022-2023

Energy Audit Report (2022-2023)
Total Power Requirement ofVariousEquipment

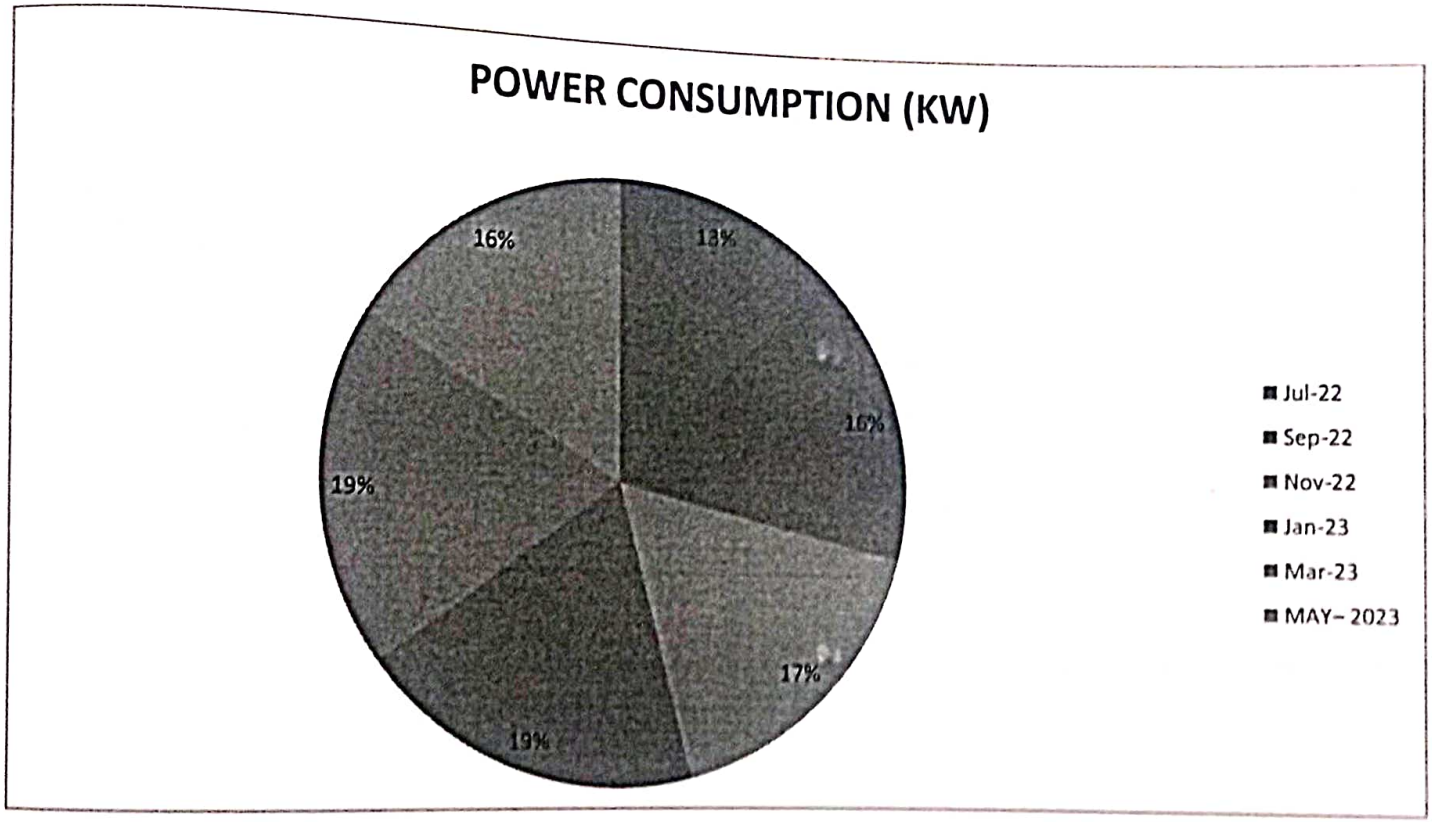
Department /Room	Fan/ Exhaust	LED/ Tube light	CFL light/ Sodium lamp	A.C.	Fridge	Computer	Printer	Xerox Machine	Projector	UPS	CCTV	LAB EQUIMENTS	BOREWELL /SUMP
Principal Office	7	18		3		1	1	1		1			
Office	10	20				8	4	1					
Physics Lab	26/4	24				6	2	1				106	
Geography Lab	16/4	16				5	3	1	2			-	
Zoology Lab	14	15			1	4	4	1	2	3		10	
Botany Lab	8/4	18			1	2	1	1	-	1		-	
Chemistry Lab	13	28				2	2	1	-	1		20	
Mathematics Lab	5	14		2		14	3	1	1	5		-	
Computer Science Lab	27/5	25		7		149	17	2	2	6		-	
Staff Room	58	76			2	23	10	11	2	8			
Library	7	22		1		22	1	1		1			
Classroom	230	309							1				
NAAC	1	4				7	2	1					
Swayam/IQAC	6	4				4	2						
NSS Room	1	2											
Sports Room	1	2											
Pantry	3	5											
LCD Hall	10	20		6		1			1	3	-/1		
Kamarajar	18	27							1				

Arangam													
Open Auditorium	24	23											
MGR Building(Tamil+ English)	111	149				15	4			9			
Passage	3	96	1										
Washroom	-	-	30										
Stage	2	2											
Store	2	2											
Soft-skill Centre	3	6			1								
Language Lab	5	1	24	3		2		1	1				
CLP	6	15		3		10			1				
Hostel	75/4	205	42/16			77			1	14			
Total Quantity	574/21	999	96/16	25	6	337	52	24	15	43	57/1	136	5/1
Quantity of instruments in use	411/10	649	50/10	5	16	120	24	15	15	19	57/1	120	2/1
Power Consumption in 'J' hour(Watt)	70/32	40	13/60	900	600	200	400	1000	300	800	18	150	5400/4100
Total Power Consumption in 'J' hour(Watt)	28.77/0.32	25.96	0.650/0.6	45	9.6	24	9.6	15	4.5	15.2	0.068	18	11.2/4.1
Consumption per day (KW)	143.85(5 hrs)/ 0.32(1hr)	129.8 (5 hrs)	3.25(5hrs) /4.59(5hr)	9 (2 hrs)	48 (5 hrs)	120 (5 hrs)	48 (5 hr)	75 (5 hr)	22.5 (5 hr)	76 (5 hrs)	1.632 (24 hrs)	72(4 hr)	56/20.5 (5hr)
Consumption in month (KWatt)	2877/6.42 (20 days)	2596 (20 days)	26 20 days)/ 144 (30 days)	180 (20 days)	384 (20 days)	2400 (20 days)	384 (20 days)	600 (20 days)	450 (20 days)	912 (20 days)	48.96 (30 days)	1440 (20 days)	1400/512.5 (25 days)
TOTAL POWER REQUIREMENTS OF ALL INSTRUMENTS – 14,334.88													

MONTHLY CONSUMPTION AS PER TAMILNADU ELECTRICITY BOARD

S.No	MONTH	POWER CONSUMPTION (KW)	ANNUAL POWER CONSUMPTION (KW)	MONTHLY CONSUMPTION (KW)
1	JULY-2022	22151	176272.4	14,689.36
2.	SEPTEMBER-2022	28706.7		
3.	NOVEMBER-2022	30141.5		
4.	JANUARY-2023	33418.1		
5.	MARCH-2023	33167.7		
6.	MAY– 2023	28687.4		

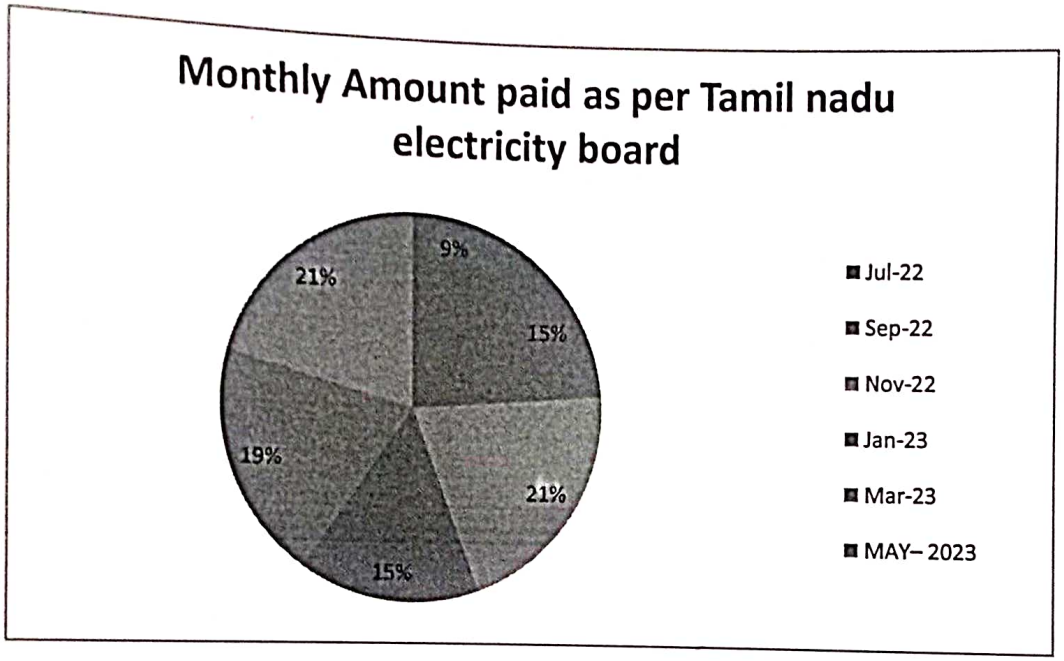
PICTORIAL REPRESENTATION OF MONTHLY CONSUMPTION AS PER TAMILNADU ELECTRICITY BOARD



MONTHLY AMOUNT PAID AS PER TAMILNADU ELECTRICITY BOARD

S.No	MONTH	AMOUNT PAID (Rs.)
1.	JULY-2022	63961
2.	SEPTEMBER-2022	108269
3.	NOVEMBER-2022	149397
4.	JANUARY-2023	111743
5.	MARCH-2023	142110
6.	MAY– 2023	150332

PICTORIAL REPRESENTATION OF MONTHLY AMOUNT PAID AS PER TAMILNADU ELECTRICITY BOARD



Data analysis

In the year 2020-2021, according to the TamilNadu Electricity board monthly power consumption was 7493.5KW and the total power requirement of various equipment of our college was estimated as 7123.55 KW. It was found that the discrepancy between the monthly power consumption of our college as per TamilNadu electricity board and power requirement of various equipment as calculated from the energy audit data was 369.95 W and this discrepancy was due to the electricity consumption of the instruments bought under RUSSA as well as due to the excess power utilized for the new building construction work.

In the year 2021-2022, 2917.86 KW oftotal power requirement of various equipment of our college was estimated by the TamilNadu Electricity board(TNEB). From the energy audit it was calculated as 2871.32 KW. So there is a decrease of 46.54 W in power consumption by our college as compared with the TNEB data.The reason for the gain in due to the installation of LTCT (Low Tension Current Transformer) in our campus to reduce and maintain the power consumption.

At the present year 2022-2023, according to the TamilNadu Electricity board monthly power consumption was 14,689.36 KW and the total power requirement of various equipment of our college was estimated as 14,334.88 KW. It was found that the discrepancy between the monthly power consumption of our college as per TamilNadu electricity board and power requirement of various equipment as calculated from the energy audit data was 354.48 W.

Conclusion

Energy audit is an effective tool in identifying and perusing a comprehensive energy management program. A careful audit of any type will give the organization a plan with which it can effectively manage the organization energy system at minimum energy cost. A detailed study has been made to reduce the electrical energy consumption in the campus of M.V.Muthiah Government Arts College for Women, Dindigul. From the conducted energy audit, it comes to know that many possibilities are there to reduce the power consumption of the college. Importantly installation of LTCT (Low Tension Current Transformer) in our campus has good compatibility towards the reduction and maintenance the power consumption.

Recommendations:

- Turn off electrical equipments when not in use
- Replacing CFLS with LED lamps
- Use computers and other electrical equipments in power saving mode
- Replacing desktop computers by laptop
- Switch off the modem at night
- Switch off the printer when it's not needed
- AC should be switched on only 15 minutes before actual use and switch off while going out
- Air conditioner shall be operated between temperature range of 23-25C to maintain lower cooling load on compressor to save energy.
-
- CRT monitor of PCS are recommended to replace with energy efficient LCD monitors to conserve energy.
- All Class Rooms, hostels, labs and common places to have Display Messages regarding optimum use of electrical appliances in the room like lights, fans, computers ,projectors etc.
- Most of the time, all the tube lights in a class room are kept ON, even though, there is sufficient light level near the window opening. In such cases, the light row near the window may be kept OFF.
- All appliances to be kept OFF or in idle mode if there will not be used for at least next one hour .
- The comfort air conditioning temperature to be set between 24°C to 26°C.
- Lights in toilet area may be kept OFF during day time

Dr.R.VALLIAMMAL M.Sc.,M.Phil.,PGDCA.,Ph.D.,
Associate Professor And Head,
Department of Physics,
Arulmigu Palaniandavar Arts College For Women,
C.K. Puthur, Palani-624 615.

(Dean of Academics)

Dr.A.Jacquiline Regina Mary
Head and Associate Professor
Department of Physics
Jayaraj Annapackiam College
for women (Autonomous)