ENERGY AUDIT REPORT

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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

2020-2021

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

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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 2020 to 2021. 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 required to 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 Dept. 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, Head of the Department, 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.

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 sustained one. 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 plan to being self-sufficient in electricity requirement.

In the present study, college electricity audit has been done. Practical laboratory, instrument, Fans, air conditioners, Computers etc are 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 are gathered where are the information.

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

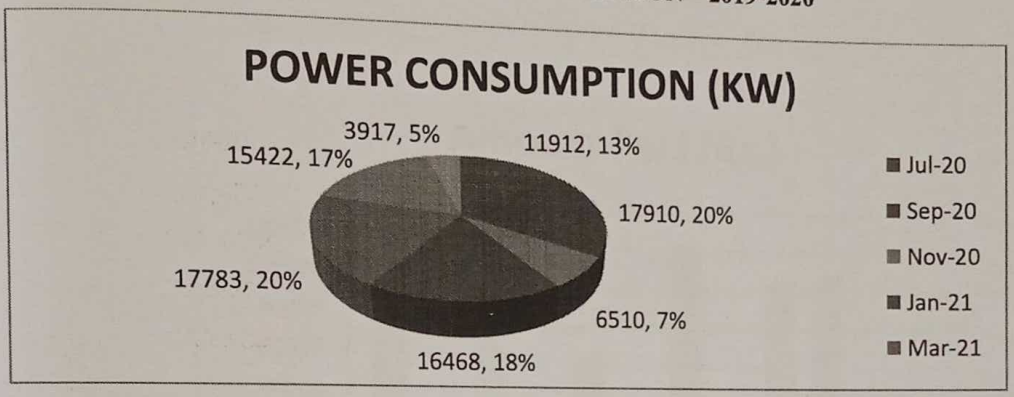
S.No	Name Of The Instruments	Year	Status
1	PH meter	2017	Working
2	Calorimeter	2017	Working
3	Diigital Balance	2017	Working
4	Gel electrophoresis	2018	Working
5	Laminar air flow & Culture rack	2019	Working

2020-2021

MONTHLY POWER CONSUMPTION AS PER TAMILNADU ELECTRICITY BOARD

SL. NO.	MONTH	POWER CONSUMPTION (KW)	ANNUAL POWER CONSUMPTION (KW)	ANNUAL MEAN (KW)	MONTHLY CONSUMPTION (KW)
1.	JULY-2020	11912	89922	14987	7493.5
2.	SEPTEMBER-2020	17910			
3.	NOVEMBER-2020	6510			
4.	JANUARY-2021	16468			
5.	MARCH-2021	17783			
6.	APRIL -2021	15422			
7.	JUNE - 2021	3917			

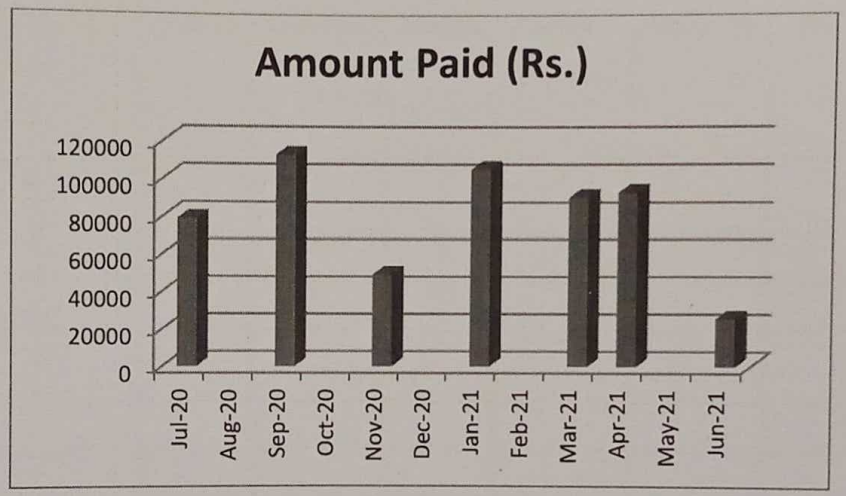
GRAPHICAL REPRESENTATION OF MONTHLY POWER CONSUMPTION – 2019-2020



MONTHLY AMOUNT PAID AS PER TAMILNADU ELECTRICITY BOARD

S.No	MONTH	AMOUNT PAID
1.	JULY-2020	79104
2.	SEPTEMBER-2020	113081
3.	NOVEMBER-2020	49133
4.	JANUARY-2021	105301
5.	MARCH-2021	90531
6.	APRIL - 2021	93125
7.	JUNE -2021	25645

GRAPHICAL REPRESENTATION OF MONTHLY AMOUNT PAID– 2020-2021



Energy Audit Report
Total Power Requirement ofVarious Equipment

DEPARTMENT /INSTRUMENTS	FAN/ EXHAUST	LED TUBE LIGHT	CFL LIGHT/ SODIUM LAMP	A.C.	FRIDGE	COMPUTER	PRINTER	XEROX MACHINE	PROJECTOR	UPS	CCTV	MIXIE/ GRINDER	LAB EQUIP.	BOREWELL /SUMP
Principal Office	7	18		3		1		1		1				
Office	10	20				8	4	1						
Physics Lab	26/5	24				6	2	1						
Geography Lab	16/5	16				4	2	1	2					
Zoology Lab	14	15												
Botany Lab	6/5	6												
Chemistry Lab	13	28				1	1							
Mathematics Lab	5	14		2		14	4	1	1	5				
Computer Science Lab	27/5	25		7		106	8	2		4				
Staff Room	50	51			2	16	10	11	1					
Library	7	22				8	1	1		1				
Classroom	198	281							1					
NAAC	1	4				7	2	1						
Swayam/IQAC	2	4				3	1							
NSS Room	1	2												

Sports Room	1	2												
Pantry	3	5												
LCD Hall	10	20		6		1			1	3				
KamarajarArangam	18	27							1					
Open Auditorium	24	23												
Passage	3	96	1											
Washroom			30											
Stage	2	2												
Store	2	2			1									
Soft-skill Centre	3	6				2		1	1					
Language Lab	5	1	24	3		10			1					
CLP	6	15		3		77			1	14				
Hostel	75/4	205	42/16		1						4	1/3		
Total Quantity	544 /24	904	97/16	24	4	264	35	21	10	28	4	1/3		2/3
Quantity of Instruments in Use	300/24	600	50/10	5	4	180	15	21	6	5	4	1/3		2/3
Power Consumption per instrument in '1' hour(Watt)	70/32	40	13/60	900	600	200	400	1000	300	800	18	1200 /750		5.6/4.1

Total Power Consumption in 1 Hour (KW)	21/0.768	24	0.650 /0.6	4.5	2.4	36	6	21	1.8	4	0.072	1.2/2.25		11.2/12.3
Consumption per Day (KW)	63 /2.304 (3 Hrs)	72 (3 Hrs)	1.95 (3 Hrs) / 6 (10 Hrs)	13.5 (3 hrs)	4.8 (2 hrs)	72 (2 hrs)	6	21 (1 hr)	-	20 (5 hrs)	1.728 (24 hrs)	1.2(1 hr) / 6.75 (3 hrs)	3.3	33.6 (3 hrs)/ 24.6 (2 hrs)
Consumption in month (KW)	1260 (20 Days) / 34.5 (15 Days)	1440 (20 Days)	48.75 (25 Days) /180 (30 Days)	270 (20Days)	96 (20Days)	1440 (20Days)	60 (10Days)	420 (20Days)	3.6 (2Days)	500 (25Days)	43.2 (25Days)	30 (25Days) / 67.5 (10Days)	66 (20 Days)	672/ 492 (20Days)
TOTAL POWER REQUIREMENTS OF ALL INSTRUMENTS = 7123.55 KW														

Data analysis

In the year 2020-2021, according to the TamilNadu Electricity board monthly power consumption was 7493.5 KW 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

Recommendations:

- Submersible pump set is to be to overhaul after three month to avoid wastage of energy due to poor performance
- Motor pump set is to be providing power capacitor.
- Air conditioner shall be operated between temperature range of 23-25C to maintain lower cooling load on compressor to save energy.
- Submersible motor found overload which need urgent repairing.
- CRT monitor of PCS are recommended to replace with energy efficient LCD monitors to conserve energy.

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