ENERGY AUDIT



MES KEVEEYAM COLLEGE

VALANCHERY

EXECUTED BY

JANUARY, 2023

PREFACE

Educational institutions should prioritize integrating sustainability into their activities to raise awareness about the campus environment and its surroundings. An assessment is necessary to gauge how well the institution is advancing toward becoming eco-friendly while fostering talent. This Energy Audit evaluates the campus's commitment to sustainability. The college aspires to be a hub of higher learning that excels in academics while instilling core human values, empowering students, and serving the larger community.

The report has been prepared by a certified energy auditor and experienced project engineers specializing in energy, environmental, and management practices.

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AUDIT TEAM

Good Observations

- 1. Water usage of the whole institution done with the help of a single well. Which is enough to meet the water consumption of the entire building.
- 2. College maintained good greenery inside the campus.
- 3. Waste management is done by placing few waste bins in various places in the campus

Suggestions for improvement in the system

- 1. Electrical Panels aren't properly labelled. Labelling is a useful thing to doing electrical work and in the case of emergency, it is helpful to isolate the area.
- Since it is a flood prone area it is better to relocate the panel room from ground floor to First floor. That can reduce the risk of safety as well as annual maintenance cost of the Electrical systems.
- 3. Neutral to Earth Voltage in the main panel is found to be higher than the standard value of **6V**. The higher neutral to earth voltage shows poor earthing of electrical panel.
- 4. Water level-based operation of Water pumps in the college saves overflow water in the water pumping system.
- 5. More waste bins could be placed near the classrooms to improve waste management on campus.

The whole world is on the road to a sustainable development, and the environment conservation is the top priority among the list as every human activity has its effect on their surroundings, which is the environment. Hence be it a house, a commercial building, an industrial building or any other construction will disturb the balance of the environment. It is very important to do a detailed study about the effects on the environment. This is conducted under the name of Energy Audit, which can be defined as the official examination of the effects a company or other organization has on the environment, especially the damage that it causes. The objectives of the Energy audit can be listed as follows:

- Including participants from every section of the institution in the auditing process.
- Identifying the activities in the premises and listing them.
- Calculating the resource consumption like the land and water.
- Assessing the waste management and disposal.
- Study the energy usage pattern.
- Identify the good practices.
- Suggest the viable solutions to improve the sustainable nature of the institution
- Compile the report with the above-mentioned details.
- Conduct a walkthrough audit to verify the suggestions implemented by the institution.

BASIC DETAILS

This section gives the basic details regarding the M E S Keveeyam College Valanchery , its electricity details and building areas.

TABLE 1: BASIC DETAILS

1	Name of the Consumer	MES KEVEEYAM COLLEGE, VALANCHERY
2	Address for communication with Phone no, email id	MES KEVEEYAM COLLEGE,Valanchery. Malappuram dist. Kerala pin 678552 principal@meskvmcollege.org
		www.meskvmcollege.org
3	Nature of activity/ Business (Industry/ commercial/Depot/warehouse/office etc.)	Educational Institution
4	Number of consumers	01
5	Contact person, Phone no.	Shajid P.P. 9846884800
6	Number of working persons	112
7	Number of Students	1936
8	Annual Working Days	196
9	Consumer number	1165668004786
10	Connected load (kW)	39 kW
11	Total Building area – (m²)	10105 m ²
12	Date of energy audit conducted	02/09/2019

MES VEKEEYAM COLLEGE, VALANCHERY



M E S Keveeyam College Valanchery has completed 33 years of dedicated service to the society in the realm of higher education. The College has endeavored to fulfil its institutional mission with great success benefitting students of socially and economically marginalized groups of Malappuram and nearby districts. The institution is sensitized to the need for improving the quality of higher education which, needless to say, is a long-term investment the society makes, expecting returns by way of human resource development. They have always strived to fulfil this expectation. The vision and mission of the college are Be a leading centre of higher learning nurturing all-round academic excellence along with core human values: a vibrant institution which enlightens the youth just as it enriches and empowers them and remains a resource centre for the larger community. The different departments are Language, Chemistry, Computer Application, Commerce, English, Physical Education, Physics, Zoology, Botany, Mathematics, Psychology, and School of distance education.



COLLEGE CAMPUS - SATELLITE VIEW (GOOGLE)

SINGLELINE DIAGRAM-ELECTRICAL



SINGLE LINE DIAGRAM

DESCRIPTION OF ELECTRICAL SYSTEM

This section gives the base line data on the electricity bills and connected loads in the MES KEVEEYAM College, Valanchery. The electricity is provided by KSEBL.

The tables below give the KSEBL bill details in the last 12 months (April 2022-March 2023).

Name of the Consumer – MES KEVEEYAM COLLEGE, VALANCHERY						
Tariff – LT I	Tariff – LT 6ANon- Domestic					
	Connected Load –39 k	W				
Month	Monthly consumption (kWh)	Total amount to be paid (Rs)				
Apr-22	6403	60006				
May-22	5096	42099				
Jun-22	4971	76313				
Jul-22	5725	43797				
Aug-22	5504	52828				
Sep-22	5224	41075				
Oct-22	5318	57528				
Nov-22	6500	50322				
Dec-22	6670	67644				
Jan-23	5816	45292				
Feb-23	6371	64167				
Mar-23	6437	53686				

 TABLE 2:ELECTRICITY BILL DETAILS

LOAD ANALYSIS

The following table shows the Electrical measurement details of major loads that are analyzed during the period of study

Sl. No.	Particulars	v	I	kW	kVA	kVAr	PF	V THD	A THD
1	Incomer	397	37.1	25.1	25.5	2.62	0.98	2.3	10.5
2	Chemistry Department	234	1.13	0.083	0.26	-0.25	0.31	1.8	13.2
3	Chemistry Lab	234	5.74	0.536	1.34	-1.34	0.4	1.8	11.5
4	Commerce Block, Canteen	233	26.8	3.95	6.3	-4.86	0.63	1.9	3.5
5	Physics Department	235	4.85	1.13	1.14	0.014	0.99	1.8	9
6	Physics Lab	234	4.2	0.193	0.99	0.97	0.2	1.8	2.8

TABLE 4: ELECTRIC LOAD ANALYSIS

The table below gives the connected load details under this consumer number in each location.

A. LIGHT & FAN LOADS

Sl No	LOCATION	LED	Т8	CFL	Ceilin g Fan	Exhaus t	Exhaust 2
		14	36	18	60	40	60
1	Classrooms	6	93	4	94		
2	Auditorium/Av Hall	3	29	31	20		
3	Club/Conference Room		4	23	11		
4	Security Room/Floor/Ups		19	8	4		
5	Library/Store		62		24		
6	Departments		26	12	28		
7	Laboratory	32	106	26	64	9	3
8	Office		3	9	6		
9	Principal Room			9	3		
10	Reception		1	2	2		
11	IQAC	2		2	2		
12	Management Room	4	3		4		
13	Girl Centre		8		2		
	Total Nos	47	354	126	264	9	3
	Total Power (kW)	0.658	12.744	2.268	15.84	0.360	0.180

TABLE 5: LIGHT & FAN LOADS

B. COMPUTER & ACCESSORIES 13

Sl No	LOCATION	РС	Printer	Printer + Scanne r	Purifier	TV	Refrigerato r
		150	150	350	120	100	160
1	Departments	13	5	1			
2	Laboratory	18					5
3	IQAC	1	1				
4	Ict Lab	32					
5	Language Lab	17					
6	E Learning	12				1	
7	Principal Room	1	5			1	
8	Commerce Lab	10			1		
9	Reception	2		1		1	
10	Library	12	3	1	1	1	
11	Office	3	5	3			
12	Main Building				3		
	Total Nos	121	19	6	5	4	5
	Total Power (kW)	18.150	2.850	2.100	0.600	0.400	0.800

TABLE 6: COMPUTER & ACCESSORIES

C. AIR CONDITIONERS

LOCATION	TYP E OF AC	Rated Powe r (Kw)	No	Capacity (TR)	Star Rating	EER
E Learning	Split	1.6	1	1.5	3 Star	3.1
Research Room	Split	1.6	1	1.5	3 Star	3.1
IQAC	Split	1.6	1	1.5	3 Star	3.1
Principal Room	Split	1.6	1	1.5	3 Star	3.1
AV Hall	Split	1.6	2	1.5	3 Star	3.1
Conference Room	Split	1.6	2	1.5	3 Star	3.1
Language Lab	Split	1.6	1	1.5	3 Star	3.1
Management Room	Split	1.6	1	1.5	3 Star	3.1
Total Power (kW)		16				

TABLE 7: AIR CONDITIONERS

D. UPS

	QUAN TITY	POW E R RATI N G	SUPPLI E R	BATTE R Y DETAI LS	OPER A TING HOUR S	NO of Batteries	Make
	(NOS)	(KVA)					
Main Block	1	5KVA	SUPRA	100AH	8	10	Hykon
Main Block	1	5KVA	SUPRA	120AH	8	8	Unix
Commerce Block	1	5KVA	SUPRA	100AH	5	8	Nova
ICT Lab	1	3KVA	SUCCES S	100AH	5	3	Hykon
ICT Lab	1	3KVA	SUCCES S	100AH	5	3	Hykon
ICT Lab	1	2KVA	DSP sinewave	80AH	5	2	Nova
Library	1	2KVA	UNIX	300AH	8	2	Unix
E Learning Block	1	5KAV	HYKON	100AH	5	10	Hykon
Physics Degree Lab	1	1KVA	APC	120AH	5	3	Triotic
Physics Pg Lab	1	1KVA	APC	120AH	5	3	Triotic
Total Power (Kw)		25.6					

E. PUMP MOTOR

LOCATION	hp	Rpm	Watts
Mosque	1 hp	2800	746
Garden	1.5hp	2800	1440
Main Block	1.5hp	2800	1440
Commerce Block	1.5hp	2800	1440
Total Power (kW)			5.066

TABLE 9: PUMP MOTOR

SUMMARY OF LOAD DETAILS:

Sl No	Particulars	Units	Values
1	Light & Fan Loads	kW	33
2	Computer & Accessories	kW	25
3	Air Conditioners	kW	16
4	Pump Motor	kW	5
5	Other Equipment & Loads (Labs)	kW	15
	Total Power (kW)		94

TABLE 10: SUMMARY OF LOAD DETAILS



FIGURE 4: SUMMARY OF LOADS

LUX MEASUREMENTS

According to National Lighting code-2010 BIS to determine the overall energy efficiency of lighting system using measurements and methods, which is applicable to all institutions. One of the methods is Illuminance method, which is the most practicable one. Details are given in this section. Lux levels of some areas are given in the Table 11. The overall Lux level in the institution shows a satisfactory graph but some places have very poor, they are mainly class rooms. Sufficient amount of light they maybe artificial or natural light, its amount is very less inside of the classrooms. The lux levels mentioned as satisfactory need to be improved. Two places showed very poor LUX level so needs to consider that two places urgently.

Sl No	Area	Measured Lux	Required Lux	Remarks
1	Chemistry UG Lab	216	150	Satisfactory
2	Chemistry PG Lab	144	150	Poor
3	Physics UG Lab	105	150	Poor
4	Language Lab	129	150	Satisfactory
5	ICT Lab	59	150	Very Poor
6	Physics PG Lab	169	150	Satisfactory
7	Botany Lab	306	150	Good
8	Zoology PG Lab	115	150	Poor
9	Zoology UG Lab	145	150	Poor
10	Research Lab	296	150	Satisfactory
11	E-Learning	245	150	Satisfactory
12	Chemistry	69	150	Very Poor
13	13 Zoology 188		150	Satisfactory
14	B.com	102	150	Poor

 TABLE 11: LUX MEASUREMENTS

Note

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Address the low illuminance levels in the ICT lab and chemistry area where we marked as ver poor

STUDENTS ACTIVITIES ON ENERGY AND ENVIRONMENT

Activities related to the energy and environment of the institution describes below:

On 14th December 2022, National energy conservation day, PG Department of Physics, in association with IQAC and Energy Conservation Forum, MES Keveeyam college, Valanchery conducted an energy conservation awareness survey in the households of the municipality of Valanchery. 39 students of the first-year BSc Physics and staff coordinator Dr. Navas MP visited 200 households in the municipality. The survey form consists of two sections to evaluate energy conservation awareness and energy consumption by members of various households. Based on the survey, the survey team recommended ways to reduce energy consumption in households. They also engaged in conversation with individuals to enlighten them on the need for energy awareness in the present situation. The public warmly responded to the survey and elucidated their queries related to energy. The survey team heartily welcomed the queries and constructively responded to them. The survey team believes that the survey will help in reducing energy consumption in the locality and that energy conservation awareness will spread in society.



The extension wing of department of chemistry organized a one day workshop on paper bag making on 22.10.2022 at division 2 Thaniyappankunnu of Valanchery Municipality. 40 women from Kudumbasree units participated in the workshop. Ward councilor Mr. Veerankutty P. inaugurated the programme. Dr. Soumini C. handled the training session.



Under the project of Swach Sagar Surakshith Sagar Abhiyan, [17/09/2022] The NSS Unit [91&105] of MES KEVEEYAM College Valanchery undertook the mission of cleaning The Ponnani Harbor and surroundings. College Principal Prof. Shajid PP inaugurated the program. The NSS Program Officer Dr. Preetha SR, Proff. Nisab T, Nusrath P, Student Volunteers Ramsheeda and Binu Riyasi etc presided over the Program. Nearly 92 volunteers activity participated in the program.



As part of NSS Day Observation, Unit No 91 and 105 of MES Keveeyam college, Valanchery conducted a mega cleaning campaign. Volunteers from both the units cleaned Primary Health Centre, Kottaram and its premises. Mr. Asharaf Ambalathingal, Chairman, Valanchery Municipality inaugurated the programme. Mr. Marath Ibhrahim (Standing Committee Chairman- Health), MS. Noorjahan, Ward Councilor addressed the audience. Ninety volunteers actively participated in the programme.



ANNEXURE-1

ABBREVI	ATIONS		
AVG		:	Average
BEE		:	Bureau of energy efficiency
CO2 :	Carbon		
KSE	dioxide		Kerala State Electricity Board.
B DB		:	Distribution Board
EC		:	Energy Conservation
IEEE		:	The Institute of electrical and electronics engineers
IS		:	Indian Standard
kL		:	kilo Littre
KV		:	kilo Volt Ampere
А		:	kilo volt Ampere Hour
kVAh		:	kilo volt ampere
kVAr		:	kilo Watts
kW		:	kilo watt
kWh		:	hour Low
LT		:	tension
MAX		:	Maximum
NSS		:	National Service Scheme

REFERENCES:

- Handbook on energy audit and environment management by TERI.
 Bureau of Energy Efficiency (BEE) books for certification of Energy Auditors & Managers.