

ENERGY AUDIT REPORT

KORAMBAYIL AHAMED HAJI MEMORIAL UNITY WOMEN'S COLLEGE

MANJERI

Executed by



2023


OTTOTRACTIONS
Energy - Engineering - Environment
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Empanelled Accredited Energy Auditor: EmAEA-33
Bureau of Energy Efficiency,
Government of India.



Empanelled Energy Auditor: EMCEEA-0211F,
EMC (Energy Management Centre-Kerala)



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ENERGY AUDIT REPORT
KORAMBAYIL AHAMED HAJI MEMORIAL
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Energy Audit Report
KAHM Unity Women's College, Majeri
Report No: EA 1000
2023



Empaneled Accredited Energy Auditor, AEA 33
Bureau of Energy Efficiency
Government of India



Empaneled Energy Auditor, EMCEEA-0211F,
Energy Management Centre
Government of Kerala.



Authorized Energy Auditor, GEDA/ENC/EAC: Autho/2014/8/103/2316,
Gujarat Energy Development Agency
Government of Gujarat



Empaneled Energy Auditor, India SME Technology Services Ltd
A joint Venture of SIDBI, SBI, Indian Bank, Oriental Bank of Commerce
& Indian Overseas Bank

About OTTOTRACTIONS

OTTOTRACTIONS established in 2005, is an organization with proven track record and knowledge in the field of energy, engineering, and environmental services. They are the first Accredited Energy Auditor from Kerala for conducting Mandatory Energy Audits in Designated Consumers as per Energy Conservation Act-2001. Government of Kerala Recognized and appreciated OTTOTRACTIONS by presenting its prestigious "The Kerala State Energy Conservation Award" for the best performance as an Energy Auditor.



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Acknowledgment

We were privileged to work together with the administration and staff of KAHM Unity Women's College, Majeri for their timely help extended to complete the audit and bringing out this report.

With gratitude, we acknowledge the diligent effort and commitments of all those who have helped to bring out this report.

We also take this opportunity to thank the bona-fide efforts of audit team for unstinted support in carrying out this audit.

We thank our consultants, engineers and backup staff for their dedication to bring this report.

Thank you.

B V Suresh Babu
Accredited Energy Auditor
AEA 33, Bureau of Energy Efficiency
For OTTOTRACTIONS




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Certification

This is to certify that

The data collection has been carried out diligently and truthfully;

All data monitoring devices are in good working condition and have been calibrated or certified by approved agencies authorised and no tampering of such devices has occurred;

All reasonable professional skill, care and diligence had been taken in preparing the energy audit report and the contents thereof are a true representation of the facts;

Adequate training provided to personnel involved in daily operations after implementation of recommendations; and

The energy audit has been carried out in accordance with the Bureau of Energy Efficiency (Manner and Intervals of Time for the Conduct of Energy Audit) Regulations, 2010.

SURESH BABU B V
ACCREDITED ENERGY AUDITOR (AEA 33)




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Executive Summary					
Consolidated Cost Benefit Analysis of Energy Efficiency Improvement Projects					
KAHM Unity Women's College, Manjeri					
SI No	Projects	Investment	Cost saving	SPB	Energy saved
		(Lakhs Rs)	(Rs)/Yr	Months	kWh/Yr
1	Energy Saving in Lighting by replacing existing 6 No's T5 (28W) Lamps to 18W LED Tube	0.02	0.01	27.38	95
2	Energy Saving in Lighting by replacing existing 69 No's T8 (40W) Lamps to 18W LED Tube	0.21	0.078	32.01	1093
3	Energy Saving in Lighting by replacing existing 17 No's CFL(15W) Lamps to 9W LED Bulb	0.02	0.005	35.21	73
4	Energy Saving by replacing existing 276 No's in-efficient ceiling fans with Energy Efficient Five star fans	8.28	0.553	179.65	7790
4	Installation of 25kWp Solar Power Plant	13.75	4.551	36.26	34219
	Total	8.52	5.19	62.10	43175
(The saving are projected as per the assumed operation time observed based in the discussions with the plant officials. The data of saving percentages are taken from BEE guide books and field measurements.)					




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1

Introduction

A detailed energy audit has been carried out at KAHM Unity Women's College, Majeri by OTTOTRACTIONS in March 2023. During the energy audit energy saving opportunities has been identified to help improving energy efficiency of the facility. OTTOTRACTIONS is an Accredited Energy Auditor of Bureau of Energy Efficiency and Empaneled Energy Auditor of Energy Management Centre, Government of Kerala.

This energy audit report complies with the clauses in *Energy Conservation Act, 2001* on mandatory energy audit (**Form 4** [refer regulation 6(2)] guidelines for preparation of energy audit report) and complies with the G.O (Rt) No.2/2011/PD dated 01.01.2011 issued by Government of Kerala on mandatory energy audit.

1.1. General Building details and descriptions

K.A. H. M. Unity women's College, Manjeri was established in 1991 and is run by Muslim Educational and Cultural Association (MECA), a registered society and as the first women's educational institution in the field of higher education in Malappuram district in Kerala. The college was founded by the visionary, Janab Korambayil Ahamed Haji. He envisaged the institution as a center based on the values of integrity and social commitment, promoting learning and culture. The college strives to produce intellectually competent, morally upright and spiritually inspired citizens in the service of the nation.



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A sprawling green campus spread over 17 acres; the college is located in Pulpatta village, about 1.6 kilometers away from Manjeri- Calicut Road. Affiliated to Calicut University, Thenhiipalam, the institution is known for its academic excellence and research potential. The college has 10 academic departments, with around 1600 students and 72 faculty members.

The college has been rated as a 'B++' Grade institution by the National Assessment and Accreditation Council (NAAC) in the third cycle with 2.77 points.

Occupancy Details		
Particulars	2021-22	2022-23
Total Students	1667	1704
Staffs	104	104
Total Occupancy of the college	1771	1808

For calculating specific energy consumption, the total built-up area is taken into account.

Energy audit team

The Energy Audit team is listed below. Besides this list various domine experts also participated in this project.

1. Suresh Babu B V, Accredited Energy Auditor, AEA 33
2. B. Zachariah, Chief Technical Consultant
3. Abin Baby, Project Engineer
4. Jomon J S, Project Engineer
5. Amrutha A M, Data Analyst
6. Anjana B S, Project Assistant



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Process description

The energy audit has been carried out at KAHM Unity Women's College, Manjeri. The following is the baseline data of this building.

BASELINE DATA SHEET FOR GREEN AUDIT							
1	Name of the Organisation	KAHM Unity Women's College, Manjeri					
2	Address (include telephone, fax & e-mail)	KAHM Unity Women's College P.O. Narukara, Manjeri, Malappuram Kerala 676 122 info@unitywomenscollege.in 0483 – 2768030 (Principal)					
2	Year of Establishment	1991					
3	Name of building and Total No. of Electrical Connections/building	KAHM Unity Women's College					
4	Total Number of Students	Boys		Girls	1704	Total 1704	
5	Total Number of Staff	104					
6	Total Occupancy	1808					
7	Total area of green cover	50%					
8	Type of Electrical Connection	HT	0	LT	7		
9	Total Connected Load (kW)	105					
10	Average Maximum Demand (KVA)	-					
11	Total built up area of the building (M ²)	5158					
12	Number of Buildings	12					
13	Average system Power Factor	0.98					
14	Details of capacitors connected	NA					
15	Transformer Details (Nos., kVA, Voltage ratio)	TR 1					
		NA					
15	DG Set Details (kVA,)	DG1	DG2	DG3	DG4	DG5	Remarks
		62.5					
16	Details of motors	Rating		Nos.		Remarks	
		5 to 10					
		10 to 50					
		Above 50					



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Energy Audit Report 2023
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Energy and utility system description

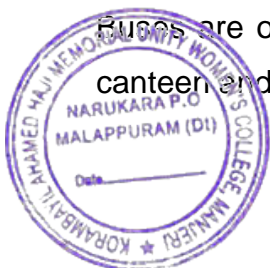
3.1.1 Electricity

Electricity is purchased from KSEB under 7 LT Connections, the details are given below. A 62.5 kVA Diesel Generator are in operation at this campus

Electricity Connection Details		
KAHM Unity Women's College, Manjeri		
1	Name of the Consumer	KAHM Unity Women's College, Manjeri
2	Tariff	LT-6A 3Ph
3	Consumer Numbers	1165467009325, 1165460033834, 1165465013047, 1165467065227, 1165464065206, 1165460013720, 1165463063712
5	Connected Load Total (kW)	98
6	Annual Electricity Consumption (kWh)	53945

3.2. Thermal Energy / Transportation

Buses are operated from college for transportation. LPG is used for cooking in the canteen and diesel is used to operate Diesel Generators.





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Principal
KAHM Unity Women's
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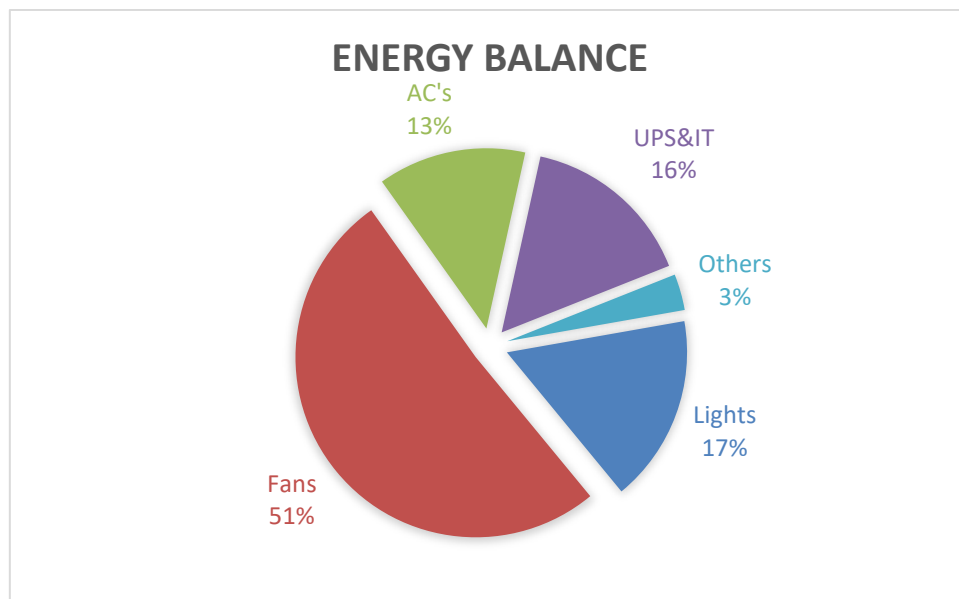
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Energy Balance



51 % of the total energy consumed in this facility is used to operate Fans. Lighting uses 17% Air-conditioners uses 13%. UPS and IT equipments Using 16%. Other equipment like pumps, Laboratory etc. uses 3%




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Performance evaluation of major utilities and process equipment's /systems.

5.1. List of equipment and process where performance testing was done.

5.1.1. Electrical System

5.1.2. Lighting & Fans

5.2. Results of performance testing

5.2.1. Electrical System

The average unit cost of electricity is **7.10 Rs/kWh**. This is taken as the basis for the financial analysis of electrical energy efficiency projects. The information on average energy consumption is taken from the historical electricity bill analysis..



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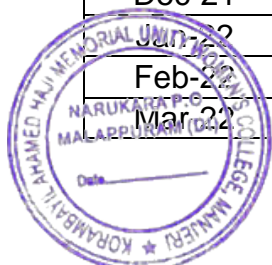
Electricity Consumption

2022-2023

Name of the Consumer		KAHM Unity Women's College, Manjeri		
Connected load	80	Consumer no	1165467009325	
Tariff	LT-6A 3Ph	Section	Manjeri South	
Month	kWh	kWh	Rs (Total)	Rs/kwh
	Import	Export		
Apr-22	1800	60	15826	8.79
May-22	3980	20	33514	8.42
Jun-22	2078	55	17500	8.42
Jul-22	3672	20	31800	8.66
Aug-22	3705	23	32978	8.90
Sep-22	2648	68	24200	9.14
Oct-22	2283	41	21414	9.38
Nov-22	2742	39	26375	9.62
Dec-22	2515	44	24800	9.86
Jan-23	2539	49	25646	10.10
Feb-23	2652	75	27420	10.34
Mar-23	3454	18	36545	10.58

2021-2022

Name of the Consumer		KAHM Unity Women's College, Manjeri		
Connected load	80	Consumer no	1165467009325	
Tariff	LT-6A 3Ph	Section	Manjeri South	
Month	kWh	kWh	Rs (Total)	Rs/kwh
	Import	Export		
Apr-21	2181	60	17316	7.94
May-21	2139	20	17500	8.18
Jun-21	1773	55	14807	8.35
Jul-21	2040	20	17385	8.52
Aug-21	422	23	3594	8.52
Sep-21	2862	30	24582	8.59
Oct-21	1729	34	14891	8.61
Nov-21	601	39	5200	8.65
Dec-21	599	44	5200	8.68
Jan-22	7339	49	63984	8.72
Feb-22	2283	30	19980	8.75
Mar-22	3131	18	27520	8.79



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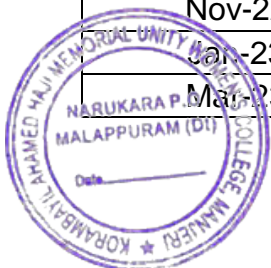
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Energy Audit Report
EA 1000-KAHM Unity Women's College, Manjeri

2022-2023			
Name of the Consumer		KAHM Unity Women's College, Manjeri	
Connected load	8	Consumer no	1165460033834
Tariff	LT-6A 3Ph	Section	Manjeri South
Month	kWh	Rs (Total)	Rs/kwh
May-22	1220	7594	6.22
Jul-22	2114	14214	6.72
Sep-22	2064	15255	7.39
Nov-22	2900	21429	7.39
Jan-23	3087	25904	8.39
Mar-23	3243	27196	8.39

2021-2022			
Name of the Consumer		KAHM Unity Women's College, Manjeri	
Connected load	8	Consumer no	1165460033834
Tariff	LT-6A 3Ph	Section	Manjeri South
Month	kWh	Rs (Total)	Rs/kwh
May-21			
Jul-21			
Sep-21			
Nov-21	475	3983	8.39
Jan-22	894	7497	8.39
Mar-22	2306	19349	8.39

2022-2023			
Name of the Consumer		KAHM Unity Women's College, Manjeri	
Connected load	10	Consumer no	1165465013047
Tariff	LT-6A 3Ph	Section	Manjeri South
Month	kWh	Rs (Total)	Rs/kwh
May-22	352	3542	10.06
Jul-22	333	3346	10.06
Sep-22	396	3981	10.06
Nov-22	421	4236	10.06
Jan-23	645	6488	10.06
Mar-23			



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2021-2022			
Name of the Consumer		KAHM Unity Women's College, Manjeri	
Connected load	10	Consumer no	1165465013047
Tariff	LT-6A 3Ph	Section	Manjeri South
Month	kWh	Rs (Total)	Rs/kwh
May-21	215	2166	10.06
Jul-21	280	2818	10.06
Sep-21	257	2589	10.06
Nov-21	404	4069	10.06
Jan-22			
Mar-22	634	6376	10.06

2022-2023			
Name of the Consumer		KAHM Unity Women's College, Manjeri	
Connected load	3	Consumer no	1165460013720
Tariff	LT-6A 3Ph	Section	Manjeri South
Month	kWh	Rs (Total)	Rs/kwh
May-22			
Jul-22	219	1952	8.90
Sep-22	110	977	8.90
Nov-22	198	1762	8.90
Jan-23	151	1340	8.90
Mar-23			

2021-2022			
Name of the Consumer		KAHM Unity Women's College, Manjeri	
Connected load	3	Consumer no	1165460013720
Tariff	LT-6A 3Ph	Section	Manjeri South
Month	kWh	Rs (Total)	Rs/kwh
May-21	43	387	8.97
Jul-21	40	357	8.97
Sep-21	58	519	8.97
Nov-21	162	1453	8.97
Jan-22			
Mar-22	116	1039	8.97



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2022-2023			
Name of the Consumer		KAHM Unity Women's College, Manjeri	
Connected load	2	Consumer no	1165463063712
Tariff	LT-6A 3Ph	Section	Manjeri South
Month	kWh	Rs (Total)	Rs/kwh
May-22	44	390	8.95
Jul-22	29	258	8.95
Sep-22	40	361	8.95
Nov-22	42	374	8.95
Jan-23	116	1041	8.95
Mar-23			

2021-2022			
Name of the Consumer		KAHM Unity Women's College, Manjeri	
Connected load	2	Consumer no	1165463063712
Tariff	LT-6A 3Ph	Section	Manjeri South
Month	kWh	Rs (Total)	Rs/kwh
May-21	55	493	8.99
Jul-21	68	614	8.99
Sep-21	34	307	8.99
Nov-21	0		8.99
Jan-22			
Mar-22	33	294	8.99

Annual Electricity Consumption (kWh)			
Consumer No	2021-22	2022-23	Connected Load (kW)
1165467009325	27099	33557	80
1165460033834	29258	14698	8
1165465013047	4299	5150	10
1165467065227	0	0	1
1165464065206	0	0	1
1165460013720	1016	502	3
1165463063712	325	38	2
Total	61997	53945	105




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Diesel

The campus has a Diesel Generator and Two College bus set in operation. The details of Diesel consumption is given below.

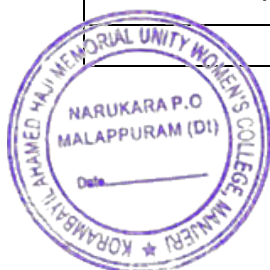
Diesel Consumption Details				
	Transportation	Generator	Total	cost
	in L	in L	in L	in Rs
21-22	7349	753	8102	769646
22-23	14452	581	15033	1443157

Base Line Energy Data			
KAHM Unity Women's College, Manjeri			
		2021-22	2022-23
1	Electricity KSEB (kWh)	61997	53945
2	Electricity DG (kWh)	2259	1742
3	Electricity Solar , Off grid (kWh)	0.00	0.00
4	Electricity (KSEB + DG + Off grid) kWh	64256	55687
5	Electricity Grid Tied (kWh)	54613	57488
6	Diesel (L)	7349	14452
7	LPG (kg)	195.00	165.00
8	Biogas (m3)	0.00	0.00

Energy Consumption Profile			
Sl No	Fuel	2021-22	2022-23
		(kCal)	
1	Electricity	55260429	47891163
2	Diesel	77159305	151746984
3	LPG	2340000	1980000
4	Biogas	0	0
Total		134759735	201618147

Solar Power Plant

Solar Power Plant		
Capacity (kWp)	Annual Generation	
	2021-22	2022-23
45	54613	57488



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Lighting

Sl.No	Location	Lights					Fans			
		LED-T	LED-B	T8	T5	T12	CFL	CF	EF	WF
1	Psychology department	1						1		
2	4 Classrooms		8					8		
3	Maths	3	1					4		
4	Corridor	8	1							
5	Classrooms	3			1			2		2
6	Hall									4
7	Zoology Department			2				2	1	
8	Zoology Lab		12		5			4		4
9	Zoology Class	3		1				4		
10	Psychology	2		2				3		
11	Malayalam department	1						1		
12	Bsc Chemistry		1					3		
13	Bsc		1					3		
14	Bsc Botany	3						3		
15	Msc Hsc		3					1		
16	BA History	1	1					4		
17	Biochemistry Lab	2	26					14	1	
18	Home science Department	1						2		
19	Home science Lab	2	8	12		1		5	1	
20	Department	1						1		
21	Manager Room	2						2		
22	Department of Language	1						1		1
23	Library		24					16		
24	Botany Department	9	2	2				10		
25	Lab	17	1	1				12		
26	Instrumentation Room		1							
27	Studio	6	2							
28	IQAC						16			2
29	BA English	1						3		
30	SeminarHall		35							
31	Physics Department			1				1		
32	Corridor	6	4	3						
33	Store		1				1	1		
34	B.Com			2				4		
35	BA History		2					2		
36	Computer Lab									10
37	Bsc CS		1					2		
38	Bsc CS		1					2		
39	Bcom		1					3		
40	Msc CS		1					2		
41	Exam Hall	2		8				21		
42	History Department	1						2		
43	Class Room			1				4		



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44	Department of Computer science			2				5		
45	Class Room	1						3		
46	Reception Block	1						1		
47	Canteen	12	5					8		
48	Auditorium		20					20		6
49	Chemistry Block	2	21					24		
50	Indoor Stadium			32						
51	Block 3		63					47		
52	Non Resident student	10	9					15		
Total		102	256	69	6	1	17	276	3	29

Lux Measurement

Sl. No:	Location	Lux Avg
1	Classrooms	68
2	Zoology Department	78
3	Zoology Lab	66
4	Zoology Class	78
5	Psychology	76
6	Malayalam department	78
7	Bsc Chemistry	89
8	Bsc Botany	84
9	Msc Hsc	95
10	BA History	78
11	Biochemistry Lab	79
12	Botany Department	78
13	Instrumentation Room	87
14	Studio	75
15	IQAC	109
16	BA English	82
17	SeminarHall	78
18	Physics Department	76
19	Store	89
20	B.Com	82
21	BA History	84
22	Computer Lab	95
23	Bsc CS	78
24	Bsc CS	79
25	Msc CS	87
26	Exam Hall	92
27	History Department	95



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Energy efficiency in utility and process system

The specific energy consumption is normally taken as the ratio of total energy consumed to the total area of building.

OTTOTRACTIONS- ENERGY AUDIT			
KAHM Unity Women's College, Manjeri			
Energy Performance Index (EPI)			
SI No	Particulars	2021-22	2022-23
1	Total building area (m ²)	5158	5158
2	Annual Energy Consumption (kCal)	134759735	201618147
3	Annual Energy Consumption (kWh)	156697	234440
4	Total Energy in Toe	13.48	20.16
5	Specific Energy Consumption kWh/m ²	30.38	45.45

The Energy Performance Index (EPI) is

45.45kWh/m²

The EPI of 2022-23 may be taken as benchmark.



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7

Evaluation of energy management system

Energy management policy

There is no written energy policy available, but environment policy is available which includes energy conservation also. A draft energy management policy is given below. The management may constitute an energy management policy and display the same in the plant to motivate the staff.

KAHM UNITY WOMEN'S COLLEGE MANJERI

ENERGY POLICY

(Draft)

We are committed to optimally utilize various forms of energy in a cost effective manner to effect conservation of energy resources. We are committed to conserve the energy which is a scarce resource with the requisite consistency in the efficiency, effectiveness in the cost involved in the operations and ensuring that production quality and quantity, environment, safety, health of people are maintained. We are also committed to increase the renewable energy share of the total energy we use.

We are also committed to monitor continuously the saving achieved and reduce its specific energy consumption by minimum of 2% every year.

Date -----

Head of the Institution



PRINCIPAL

Korambayil Ahamed Haji
Memorial Unity Women's
College, Manjeri

Energy Audit Report 2022

EA 1000-KAHM Unity Women's College, Manjeri



7.1. Energy management monitoring system

- **Energy Management Cell** has to be constituted with an objective to revise action plan for energy conservation thereby reducing the production cost.
- Energy conservation tips/ posters are displayed in crucial points.
- Use of renewable energy has to be encouraged.

7.2. Training to staff responsible for operational and Documentation.

- The staff and students need to be made more aware of the importance of energy saving and management.
- Log books shall be maintained to record Electricity Consumption and Diesel consumption.
- Meter reading shall be taken and compared with KSEB regularly.
- Better operating practices regarding appliances and fixtures should be taught to the staff.

7.3. Best Practices

- Have solid waste management program
- Conducted Green Audit.
- Have different social and environmental clubs
- Installed LED bulbs
- Conducted Energy Conservation Training Programs
- Installed Solar Power Plant



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8

Energy Conservation Measures and Recommendations

Executive Summary					
Consolidated Cost Benefit Analysis of Energy Efficiency Improvement Projects					
KAHM Unity Women's College, Manjeri					
SI No	Projects	Investment	Cost saving	SPB	Energy saved
		(Lakhs Rs)	(Rs)/Yr	Months	kWh/Yr
1	Energy Saving in Lighting by replacing existing 6 No's T5 (28W) Lamps to 18W LED Tube	0.02	0.01	27.38	95
2	Energy Saving in Lighting by replacing existing 69 No's T8 (40W) Lamps to 18W LED Tube	0.21	0.078	32.01	1093
3	Energy Saving in Lighting by replacing existing 17 No's CFL(15W) Lamps to 9W LED Bulb	0.02	0.005	35.21	73
4	Energy Saving by replacing existing 276 No's in-efficient ceiling fans with Energy Efficient Five star fans	8.28	0.553	179.65	7790
4	Installation of 25kWp Solar Power Plant	13.75	4.551	36.26	34219
Total		8.52	5.19	62.10	43175
(The saving are projected as per the assumed operation time observed based in the discussions with the plant officials. The data of saving percentages are taken from BEE guide books and field measurements.)					



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OTTOTRACTIONS- ENERGY AUDIT	
Energy Saving Proposal	
Energy Saving in Lighting by replacing existing 6 No's T5 (28W) Lamps to 18W LED Tube	
Existing Scenario	
6 numbers of T5(28 W) lamps were identified during the energy audit field survey in the facility. During discussion with officers it is observed that the average utility of these fittings are of 30%.	
Proposed System	
The existing T5 may be replaced to LED Tube of 18W in phased manner and the savings will be of 55% (inclusive of improved light output and reduced energy consumption)	
Financial Analysis	
Annual working hours (hr)	2400
No of fittings	6
Total load (kW)	0.24
Annual Energy Consumption (kWh)	173
Expected Annual Energy saving for replacing all fittings (kWh)	95
Cost of Power	8.30
Annual saving in Lakhs Rs (1st year)	0.01
Investment required for complete replacements [@Rs 300 per fittings](Lakhs Rs)	0.02
Simple Pay Back (in Months)	27.38



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OTTOTRACTIONS- ENERGY AUDIT	
Energy Saving Proposal	
Energy Saving in Lighting by replacing existing 69 No's T8 (40W) Lamps to 18W LED Tube	
Existing Scenario	
69 numbers of T8(40 W) lamps were identified during the energy audit field survey in the facility. During discussion with officers it is observed that the average utility of these fittings are of 30%.	
Proposed System	
The existing T8 may be replaced to LED Tube of 18W in phased manner and the savings will be of 55% (inclusive of improved light output and reduced energy consumption)	
Financial Analysis	
Annual working hours (hr)	2400
No of fittings	69
Total load (kW)	2.76
Annual Energy Consumption (kWh)	1987
Expected Annual Energy saving for replacing all fittings (kWh)	1093
Cost of Power	7.10
Annual saving in Lakhs Rs (1st year)	0.08
Investment required for complete replacements [@Rs 300 per fittings](Lakhs Rs)	0.21
Simple Pay Back (in Months)	32.01



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OTTOTRACTIONS- ENERGY AUDIT	
Energy Saving Proposal	
Energy Saving by replacing existing 276 No's in-efficient ceiling fans with Energy Efficient Five star fans	
Existing Scenario	
There are 276 numbers of ceiling fans installed in the facility with minimum 8 hrs a day operation. All are conventional type and most of them are very old.	
Proposed System	
There is an energy saving opportunity in replace the existing fans with new five star labelled fans. The five star labelled fans give a savings up to 30% with higher service value (air delivery/watt).	
Financial Analysis	
Annual working hours (hrs)	2400
Total numbers of ordinary fans	276
Total load (kW)	19.32
Annual Energy Consumption (kWh)	27821
Expected Annual Energy saving, for total replacement(kWh)	7790
Cost of Power (Rs)	7.10
Annual saving in Lakhs Rs (1st year)	0.55
Investment required for a total replacement (Lakhs Rs)[@3000 Rs per Fan with 50W at full speed]	8.28
Simple Pay Back (in Months)	179.65



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OTTOTRACTIONS- ENERGY AUDIT	
Energy Saving Proposal	
Energy Saving in Lighting by replacing existing 17 No's CFL(15W) Lamps to 9W LED Bulb	
Existing Scenario	
24 numbers of CFL (15W) lamps were identified during the energy audit field survey in the facility. During discussion with officers it is observed that the average utility of these fittings are of 30%.	
Proposed System	
The existing CFL may be replaced to LED Bulb of 9W in phased manner and the savings will be of 40% (inclusive of improved light output and reduced energy consumption)	
Financial Analysis	
Annual working hours (hr)	2400
No of fittings	17
Total load (kW)	0.26
Annual Energy Consumption (kWh)	184
Expected Annual Energy saving for replacing all fittings (kWh)	73
Cost of Power	7.10
Annual saving in Lakhs Rs (1st year)	0.01
Investment required for complete replacements [@Rs 90 per fittings](Lakhs Rs)	0.02
Simple Pay Back (in Months)	35.21



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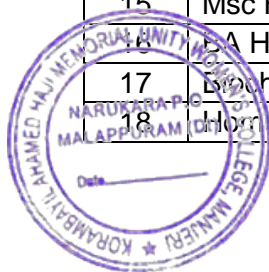
Energy Saving Proposal	
Installation of 25kWp Solar Power Plant	
Existing Scenario	
There is a good potential of solar power electricity generation. The availability of sunlight is very high. There are some canopies available in the proposed site, but by having proper trimming of trees this may be avoided. If the SPVs are placed in the roof top it will help improving RTTV (Roof Thermal Transmittance Value) of the building.	
Proposed System	
It is proposed to have a Solar Power Plant of 50kW at the beginning stage. The state and central government is pushing and giving good assistance to the installation. It can be installed as an internal grid connected system which is much cheaper than off grid system. Now days the technology provides trouble free grid interactive and connected system. The installation will provide 25yrs trouble free generation with only 20% efficiency loss at the 25th year.	
Financial Analysis	
Proposed Solar installed Capacity (kW)	25
Total average kWh per day expected (3.5kWh/day average)	93.75
Total annual Generating Capacity (kWh)	34219
Cost of energy generated annually Lakhs Rs	4.55
Investment required (INR lakh)(Approx)	13.75
Simple Pay Back (in Months)	36.26
Life cycle in Yrs	25
Total Saving in Life Cycle (Approx) RS lakh	113.78



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Technical Supplements

KAHM Unity Women's College, Manjeri																		
Sl.No	Location	Lights					Fans				IT			Others			Others	
		LED-T	LED-B	T8	T5	T12	CFL	CF	EF	WF	Printer	Projector	PC	TV	AC (1TR)	AC (1.5)		AC (3TR)
1	Psychology department	1						1				1		1				Purifier-2
2	4 Classrooms		8					8										Centrifuge-2
3	Maths	3	1					4										Weigh Machine-4
4	Corridor	8	1															Double Distillation-2
5	Classrooms	3			1			2		2								Calorimetre-2
6	Hall									4		1					3	Shaker-1
7	Zoology Department			2				2	1									PH Meter-1
8	Zoology Lab		12		5			4		4				1				Spectrometer-1
9	Zoology Class	3		1				4										
10	Psychology	2		2				3										P/A System-3
11	Malayalam department	1						1						1				
12	Bsc Chemistry		1					3										
13	Bsc		1					3						1				
14	Bsc Botany	3						3										
15	Msc Hsc		3					1				1	2					
16	BA History	1	1					4				1		1				
17	Biochemistry Lab	2	26					14	1				2		1			
18	Home science Department	1						2										

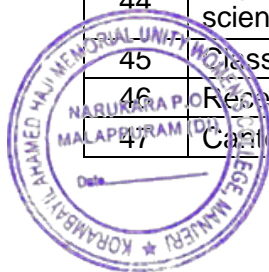


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Energy Audit Report 2023

19	Home science Lab	2	8	12		1		5	1								
20	Department	1						1									
21	Manager Room	2						2						2			
22	Department of Language	1						1		1			1				
23	Library		24					16					27				
24	Botany Department	9	2	2				10		1	1	1					
25	Lab	17	1	1				12			2						
26	Instrumentation Room		1									7					
27	Studio	6	2									4	1		2		
28	IQAC						16			2	1		2				
29	BA English	1						3									
30	SeminarHall		35											4			
31	Physics Department			1				1									
32	Corridor	6	4	3													
33	Store		1				1	1									
34	B.Com			2				4					1				
35	BA History		2					2									
36	Computer Lab								10		1	49			4	4	
37	Bsc CS		1					2									
38	Bsc CS		1					2			1						
39	Bcom		1					3					1				
40	Msc CS		1					2									
41	Exam Hall	2		8				21									
42	History Department	1						2		1		1					
43	Class Room			1				4									
44	Department of Computer science			2				5				1					
45	Class Room	1						3					1				
46	Reception Block	1						1				1					
47	Canteen	12	5					8									



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48	Auditorium		20				20		6									
49	Chemistry Block	2	21				24				1							
50	Indoor Stadium			32														
51	Block 3		63				47											
52	Non Resident student	10	9				15											
Total		102	256	69	6	1	17	276	3	29	5	9	100	7	7	6	7	



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Memorial Unity Women's
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Energy Audit Report 2023
A 1000-KAHM Unity Women's College, Manjeri

CALL
1912
 CUSTOMER CARE 24x7
KSEB

250/23

Demand/Disconnection Notice
 As per Reg 122 of Supply Code-2014)
 Manjeri South Section
 0483-2766170
 KSEBL-GSTIN: 32AAECK2277NBZ1



C#: 1165460033834

Bill# : 6546230319630
 Conn Id : 9721965
 Name : M. P. H. HASSAN MAHMOO
 SECRETARY, MUSLIM E
 Status : Connected
 Pole : AU-51/1
 Trans : UNITY COLLEGE
 Meter# : 4511791
 Bill Area : A06/13/170
 Bill Date : 16/03/2023
 Due Date : 27/03/2023
 Disconn Dt : 13/04/2023
 Tariff : LT-6B NDon
 Purpose : Hostel of NON-S
 S Deposit : 23103

32034

Prev. Payment

Prv Paid Dt : 20-01-2023
 Prv Paid Amt : 25904

Main Meter

Meter(MH) Status OK
 Load : 8 KW
 C Demand : 7.75 KVA
 Phase : 3
 Prv Rd Dt : 18/01/2023
 Prs Rd Dt : 16/03/2023
 Mt Rd(OHF) : 1

Readings & Cons. (MM)

Unit	Curr	Prev	Cons	Avg
KWH/A/1	15465	12212	3243	2460

Bill Details

Fixed Charges	1440.00
Meter Rent	35.40
Energy Charges	23187.45
Duty	2318.74
Fuel Sur.	214.04
Round off	0.37

Bill Amount : 27196.00
Payable : 27196.00

Remarks

Fuel Sur. @ Rs. 09/unit
 Mtr Rent: 30 CGST 9%; 2.7 SGST 9%; 2.7

Pay Online <https://vss.kseb.in>
 AKSHAY H
 9207124
 Meter Reader
 SBM:VT -1.46 /11002226
 16-03-2023 10:59:46 AM

Gas Electricity bill
 8/16/23



Principal
PRINCIPAL
 Korambayil Ahamed Hajji
 Memorial Unity Women's
 College, Manjeri

KSEB KERALA STATE ELECTRICITY BOARD LTD

RECEIPT

Ele. Section: 547-Manjeri North(Coll)Center: Electrical Section Manjeri North
 Receipt No: 45070220530101172 Original # 1 Date: 30-05-2022
 Consumer No: 11654467009325 THE PRINCIPAL of Electrical Section Manjeri South
 Payment Mode: Cash

Sl.	Bill No.	Description	Amount due	Surcharge	Total paid	Balance
	450702205300075-RnCC		15826.00 0		15826.00 4.00	
Total			15826.00		15830.00	

Rs. 15830.00 (Rupees Fifteen Thousand Eight Hundred and Thirty Only)

Principal incharge
KAHM Unity Women's
College, Manjeri
Cashier

Remarks: QUITE

Next-time pay online visit www.kseb.in

AMBILI U R 11071511

Last Billed Rdg. Date		Prev. Rdg. Date		Prev. Meter Rdg. Status		Prst. Rdg. Date		Prst. Meter Rdg. Status	
01-04-2022		01-04-2022		Working		03-05-2022		Working	
Power Unit	Zone	Trading	Initial Reading(IR)	Final Reading(FR)	OMF	Units*			
KWH	Cumulative	Import	464.00	554.00	20	1800			
KWH	Cumulative	Export	454.00	457.00	20	60			

Remarks :

Last Paid Amount - Rs.33515.00
 Last Payment Date - 02-04-2022

Bill Details

			[INR] Amount(Rs.)
a)	Fixed Charges	Fixed Charge[FC]	5200.00
		Sub Total	5200.00
b)	Energy Charges	Energy Charge[EC]	11310.00
		Sub Total	11310.00
c)	Other Charges	Electricity Duty[ED]	1131.00
		Sub Total	1131.00
		Sub Total	0.00
e)	Total Amt.(BILL#6546220500075) (a+b+c)		17641.00
f)	Surcharge		0.00
g)	Reconnection Fee		0.00
h)	Interim Bills		0.00
i)	Arrears		0.00
j)	Less paid/adj.		-1815.00
k)	Less Advance		-0.00
	Net Payable(e+f+g+h+i+j-k)		15826.00

Demand for 5/2022 is Rupees Seventeen Thousand Six Hundred and Forty One Only

Payment Options: Cash, Cheque, DD, MO. Online: www.kseb.in (Debit/Credit Cards, Net Banking). Other Platforms: BBPS, Friends, Akshaya, CSC, NACH

Senior Superintendent

* dt: 11/05/2022 printed @ 30/05/2022 02:05:04



Principal incharge
KAHM Unity Women's
College, Manjeri

PRINCIPAL
Korambayil Ahmed Hajji
Memorial Unity Women's
College, Manjeri

KERALA STATE ELECTRICITY BOARD LTD

RECEIPT

3
3971197

Ele Section : ...
 Receipt No : 5970320992101101 Original # 1
 Consumer : 1165467009325 THE PRINCIPAL of Electrical Section Manjeri South
 Date : ...
 Payment Mode : ...

Sl.	Bill No.	Description	Amount due	Surcharge	Total paid	Balance
		Advance	0		33515.00	
Total			0.00		33515.00	

Received Rs. 33515.00 (Rupees Thirty Three Thousand Five Hundred and Fifteen only)

Remarks: Perfect Advance @ NC COUNTER

[Signature]
 Principal incharge
**KAMM Unity Women's
 College, Manjeri**

Next time pay online visit www.kseb.in

AMBILI U T 110



C#: 1165467009325

ll# : 6546220400070
 nn. Id : 9692014
 : THE PRINCIPAL
 UNITY WOMANS COLLEG
 itatus : Connected
 e : AU-51/8
 ns : UNITY COLLEGE
 erf# : X1413909
 i Area : MD1/1/66
 i Date : 01/04/2022
 Date : 11/04/2022
 :onn Dt: 26/04/2022
 ff : LT-6A MDon
 ose : Educational Ins
 posit : 38250
 r(MM) Status OK
 : 80 KW
 iand : 79.505 KVA
 l : 3
 id Dt : 02/03/2022
 d Dt : 01/04/2022
 (OHF): 20

iv. Payment

id Dt : 04-03-2022
 id Amt : 27520

dings & Cons.

Curr	Prev	Cons	Avg
464	265	3980	173
454	453	20	9

Details

arges	nt	arges	nt
5270.00	0.00	29740.00	29740.00
		33514.00	33514.00



Make Payment

[Signature]

20/6/22

[Signature]
PRINCIPAL
 Kerambayil Ahamed Haji
 Memorial Unity Women's
 College, Manjeri


Remarks
 aster

KORAMBAYIL AHAMED HAJI MEMORIAL UNITY WOMEN'S COLLEGE, MANJERI

STUDENTS STRENGTH AS ON FEBRUARY 2023

Sl. No	Nature & Name of	At the beginning of the			Admission during the			Withdrawal during			At the end of the Month		
		3	4	5	6	7	8	9	10	11	12	13	14
1	2	1 Year	II Year	III Year	1 Year	II Year	III Year	1 Year	II Year	III Year	1 Year	II Year	III Year
		46	41	47				1	1		45	40	47
1	B.Sc. Computer Sc	41	45	50							41	45	50
2	B. Sc. Chemistry	43	48	46							43	48	46
3	B. Sc. Botany												
4	B. Sc. Family & Community Science	40	39	44							40	39	44
5	B. Sc. Mathematic	39	45	50							39	45	50
6	B.A. English	64	53	47							64	53	47
7	B.A. History	69	64	63							69	64	63
8	B. Com. Co-operati	67	66	60							67	66	60
9	M. A. Englih	29	3	0							29	3	0
10	M. Sc. Chemistry	19	20	0	1						20	20	0
11	M. Sc. Botany	19	11	0							19	11	0
	Year - wise Total	476	462	407	1			1	1		476	461	407
	Grand Total	1345			1			2			1344		




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