

JAMAL MOHAMED COLLEGE (*Autonomous*)

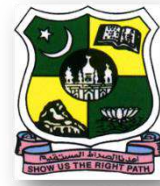
COLLEGE WITH POTENTIAL FOR EXCELLENCE

Accredited (3rd Cycle) with 'A' Grade By NAAC

(Affiliated to Bharathidasan University)

TIRUCHIRAPPALLI – 620020

TAMILNADU, INDIA



ENERGY AUDIT REPORT 2021-2022



AUDIT / REPORT BY



ALCHEME GREEN ENERGY COMPANY

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ACKNOWLEDGEMENT

We at ALCHEME GREEN ENERGY COMPANY, Madurai are thankful to the Principal for giving us the opportunity to carry out Energy audit at Jamal Mohamed College, Trichy -620 020, Tamilnadu, India. Alcheme Green Energy Company team is also thankful to all other supporting Officers / Staffs of the above institute for their wholehearted support, hospitality and the courtesy extended to the Audit team during the course of the visit.

The following officers from Alcheme Green Energy Company under the guidance of Mr. C. Jebaraj, B.Tech., have carried out the Energy Audit.

Name	Qualifications	Certification Number
Mr. C. Jebaraj	B.Tech., PDGEM., DIS., BEE Certificated Energy Auditor, IRCA Certified Lead Auditor –OHSMS, Internal Auditor-QMS CII Certified Carbon footprint Professional	EA-9847
Mr. S. Lakshmana Kumaran	B. Tech., MSc., (Env. Science), MBA., IRCA Certified Lead Auditor ISO 14001 EMS	UID - 351851

The following staff from the Institution participated in the audit process

Name	Designation
Dr. D. I. George Amalarethnam	Associate Professor of Computer Science Coordinator, IQAC
Dr. A. Jafar Ahamed	Associate Professor of Chemistry Core Member, IQAC
Dr. S. Nagoor Gani	Associate Professor of Tamil Coordinator, Khajamian Hostel
Dr. B. Sirajudeen	Assistant Professor of Tamil In-Charge, Campus Maintenance
Mr. M. Shaik Mohideen	Electrician – (Training Instructor- Sp. Gr.)

2
27/7/22



Summary of Audit

Energy audit of Jamal Mohamed College and Hostel was carried by Alcheme Green Energy Company. The Audit team has gone through the data related to TNEB GRID Electrical Energy, Renewable Energy, Diesel and LPG consumption. A study was also carried out on Renewable energy utilisation and Energy Conservation measures to reduce energy consumption.

During the visit it was observed that Jamal Mohamed College strictly follows reduce, reuse and recycle policy to limit energy usage. The concept of energy conservation is disseminated among the students and staffs through various seminars/workshops and training programs.

We hope that the results presented in the energy auditing report will serve as a guide for the institution on the existing energy related practices and resource usage.

Noteworthy

- **Green Energy generation from 50KW of Solar Power Plant**
- **Utilisation of Solar Thermal energy from 3000 LPD Solar Water Heater**
- **Reduction of LPG fuel by utilising Biogas plant**
- **Applying technology to SAVE WATER and ENERGY by Auto power cut off system in waters pumping**

The audit outputs and recommendations are summarised as follows

- Electrical Energy consumption from TNEB during the year 2021-2022 – 11,04,486 units.
- Electrical Energy consumption from Diesel Generator – 14,535 units.
- Solar Power Electrical energy consumption (Women's Hostel)- 40,019 units
- Total Electrical Energy consumption from EB, DG and Solar – 11,59,040 units.
- LPG consumption -20,995 Kgs
- Diesel Consumption for transport -14,690 Litres
- Biogas generation- 15,300 M³
- Replacement of Conventional lights with Energy Efficient LED lights are done on phased manner
- Solar power plant shall be planned in future for HT service.
- More Green energy utilisation shall be planned in the coming years.

ENERGY SAVING POTENTIALS

1. Conventional tube lights shall be replaced with LED tube lights

Replacement cost for 100 LED tube lights-Rs 200x100= RS 20,000

Payback period-5.5 months

Cost savings for 100 LED tube lights-Rs 44,000 / year

Energy savings for 100 LED tube lights-5,500 units/ year

2. Conventional fans shall be replaced with energy efficient fans

Replacement cost for 100 Nos. ENERGY EFFICIENT FAN-Rs 2,800x100= RS 2,80,000

Cost savings for 100 Nos. ENERGY EFFICIENT FAN -Rs 1,65,600 / year

Energy savings for 100 Nos. ENERGY EFFICIENT FAN -20,700 units/ year

Payback period 20 months

- Remaining Conventional Tube lights shall be replaced with LED tube lights in a phased manner
- 5 Star rated Energy efficient electrical equipments shall be procured in future

We are happy to submit this detailed energy audit report to the Jamal Mohamed College

Alcheme Green Energy Company
Madurai



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1. College TNEB HT Service connection Tariff, Connected Load and Energy consumption details for the year 2021-2022

TNEB HT SERVICE CONNECTION DETAILS	
Service Number	06 909 442 0210
Tariff	HT II B
Maximum Demand Permitted	250 KVA

Service no 06909440210													Total
Tariff HT IIB,		Permitted MD-250 KVA					Demand charges Rs 350/KVA						
	Rate Rs/ units	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	
Industrial consumption	6.35	3153	5176	9445	21400	19081	17522	23574	10187	12065	31988	21503	175094
Peak Hr consumption	1.27	0	0	0	0	0	0	0	0	0	0	0	0
Night hr consumption	0.3175	0	0	0	0	0	0	0	0	0	0	0	0
Quarters consumption	0	0	0	0	0	0	0	0	0	0	0	0	0
Commercial consumption	8.05	1095	472	430	484	484	595	442	268	388	580	389	5627
Temp supply consumption	12	840	642	761	892	585	665	910	816	841	1218	1050	9220
Total units		5088	6290	10636	22776	20150	18782	24926	11271	13294	33786	22942	189941
Total amount in Rs		130400	130243	158534	246397	222729	217982	256808	165413	178277	328940	248355	2284078
overall unit cost in Rs		25.63	20.71	14.91	10.82	11.05	11.61	10.30	14.68	13.41	9.74	10.83	

HT Service Energy Consumption details for the year 2021-2022

HT Tariff II B- Consumption	175094	units
HT Commercial Consumption	5627	units
HT Temp Supply	9220	units
Total	189941	units

2.College TNEB LT Service connection Tariff, Connected Load and Energy consumption details for the year 2021-2022

TNEB LT SERVICE CONNECTION DETAILS				
Sl.No	SERVICE NO	Department	Tariff	connected load in KW
1	06 222 207 544	Computer	LM2B2/ LTCT	94.99
2	06 222 207 1131	MBA	LM2B2/ LTCT	82
3	06 222 207 509	Tamil	LM 2B1/ LT	48
4	06 222 207 13	General Library COE Office	LM 2B1/ LT	36
5	06 222 207 14	Maths	LM 2B1/ LT	48
6	06 222 207 15	Main Gate	LM 2B1/ LT	5.99
7	06 222 207 16	Principal Office	LM 2B1/ LT	40.08
8	06 222 207 17	Main Building	LM 2B1/ LT	48
	Total			403.06

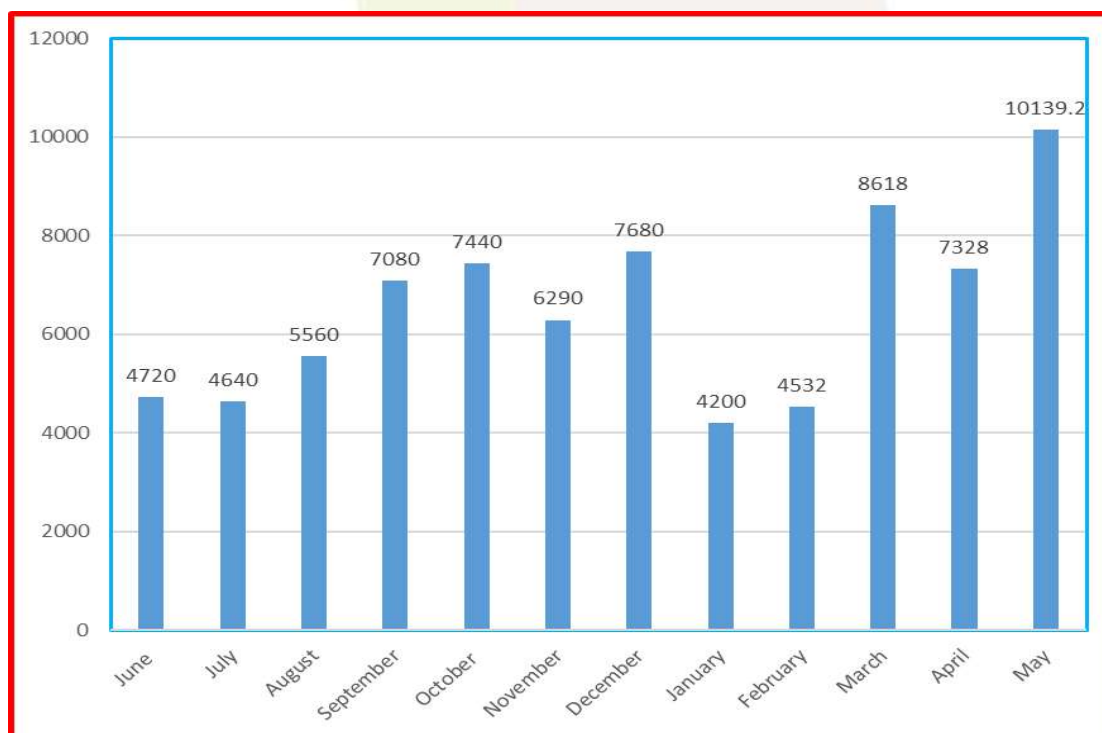
TNEB ENERGY CONSUMPTION					
Sl. No	SERVICE NO	Tariff	Units Consumed	Bill Amount -Rs	Average Unit cost-Rs
1	06 222 207 544	LM2B2/ LTCT	78227.2	685792	8.77
2	06 222 207 1131	LM2B2/ LTCT	57640	515515	8.94
3	06 222 207 509	LM 2B1/ LT	16890	137151	8.12
4	06 222 207 13	LM 2B1/ LT	30291	209445	6.91
5	06 222 207 14	LM 2B1/ LT	44380	303111	6.83
6	06 222 207 15	LM 2B1/ LT	3620	26278	7.26
7	06 222 207 16	LM 2B1/ LT	61520	411364	6.69
8	06 222 207 17	LM 2B1/ LT	64500	427256	6.62
	Total		357068.2	2715912	

3.Total TNEB Electrical Energy Consumption in the college

	HT Service units	
1	HT II B	175094
2	HT Commercial	5627
3	HT Temp	9220
	LT SERVICE	
1	LM 2B2- 2 Nos	135867
2	LM 2B1- 6 Nos	221201
	Total	547009

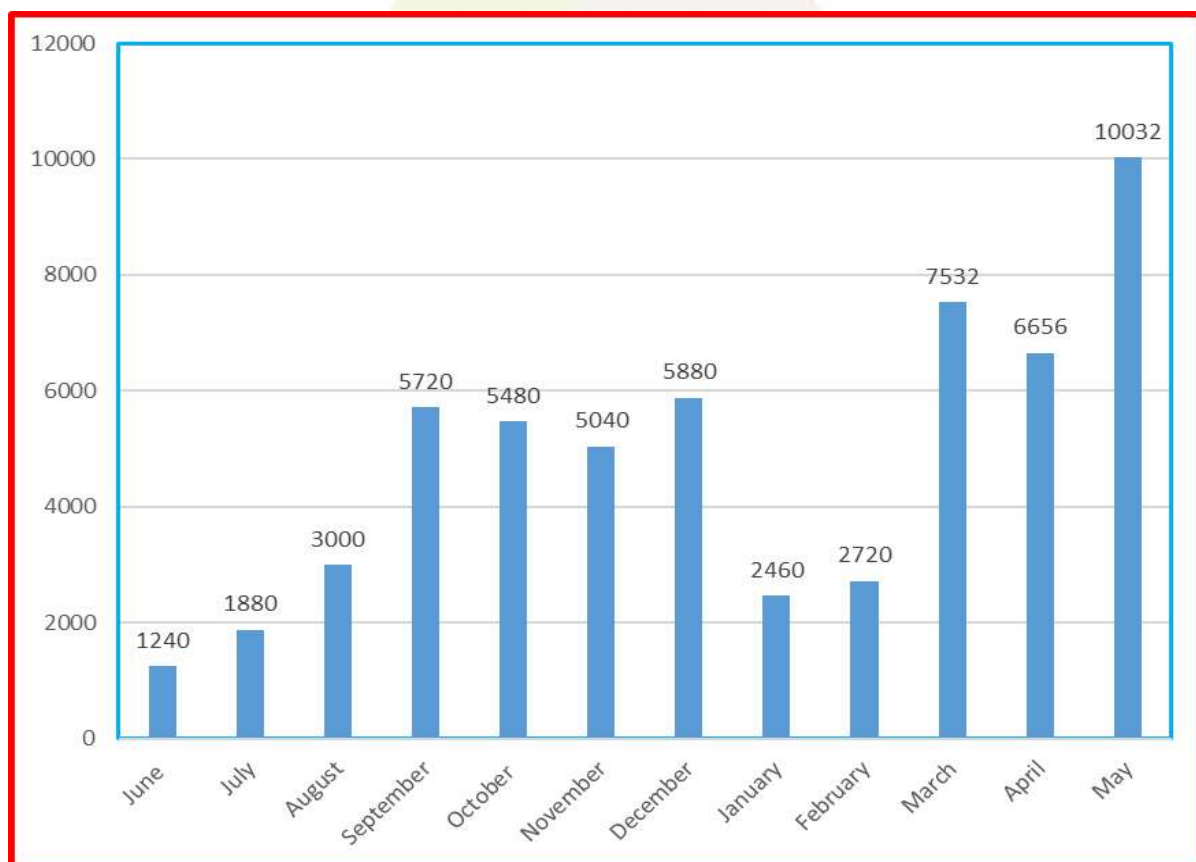
4.College TNEB LT service number wise energy consumption

1.Service No 06 222 207 544 94.99 KW 3 Phase Tariff LM2B2					
Sl. No.	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	30.06.2021	June	4720	42921	9.09
2	31.07.2021	July	4640	42300	9.12
3	31.08.2021	August	5560	49569	8.92
4	30.09.2021	September	7080	61626	8.70
5	30.10.2021	October	7440	64470	8.67
6	30.11.2021	November	6290	55005	8.74
7	31.12.2021	December	7680	66354	8.64
8	31.01.2022	January	4200	38904	9.26
9	28.02.2022	February	4532	41537	9.17
10	31.03.2022	March	8618	73678	8.55
11	30.04.2022	April	7328	63645	8.69
12	30.05.2022	May	10139.2	85783	8.46
	Total		78227.2	685792	8.77



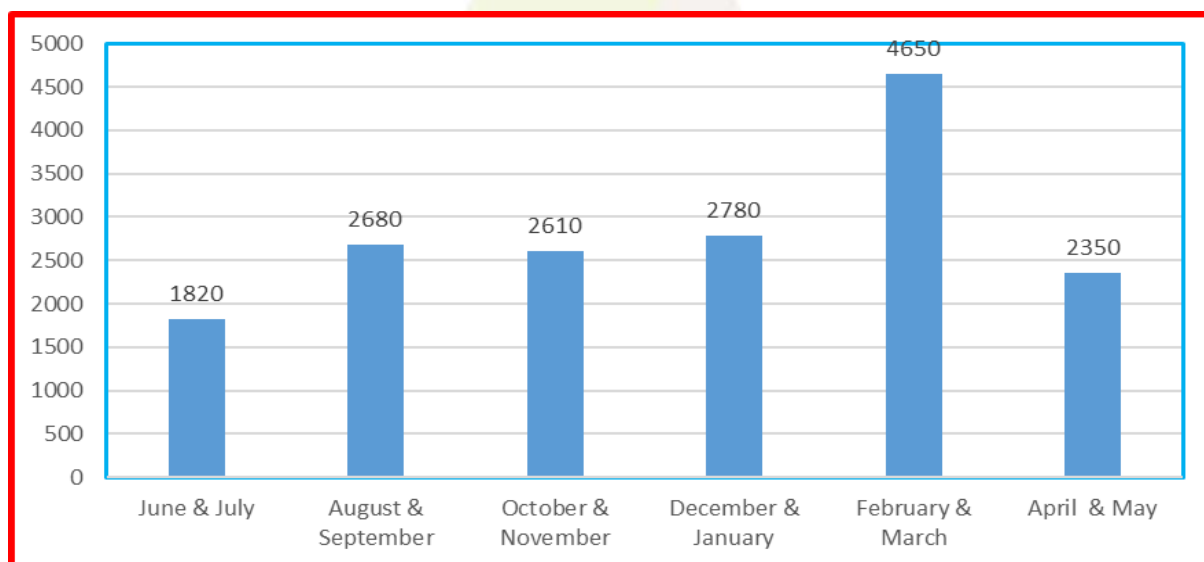
Month wise Energy Consumption

2.Service No 06 222 207 1131 82 KW 3 Phase Tariff LM2B2					
Sl. No.	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	30.06.2021	June	1240	14751	11.90
2	31.07.2021	July	1880	19800	10.53
3	31.08.2021	August	3000	28629	9.54
4	30.09.2021	September	5720	50109	8.76
5	30.10.2021	October	5480	48228	8.80
6	30.11.2021	November	5040	44748	8.88
7	31.12.2021	December	5880	51384	8.74
8	31.01.2022	January	2460	24413	9.92
9	28.02.2022	February	2720	26481	9.74
10	31.03.2022	March	7532	64764	8.60
11	30.04.2022	April	6656	58046	8.72
12	30.05.2022	May	10032	84162	8.39
	Total		57640	515515	8.94



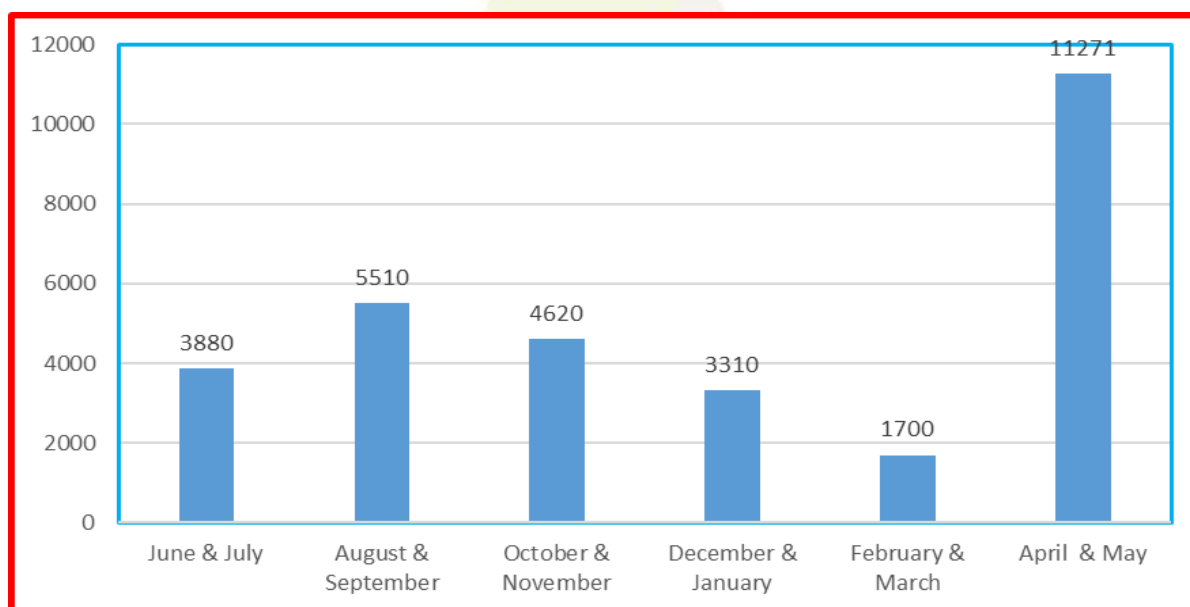
Month wise Energy Consumption

3.Service No 06 222 207 509 48 KW 3 Phase Tariff LM 2B1					
Sl.No	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	24.08.2021	June & July	1820	16802	9.23
2	27.10.2021	August & September	2680	22037	8.22
3	22.12.2021	October & November	2610	21632	8.29
4	24.02.2022	December & January	2780	22646	8.15
5	23.04.2022	February & March	4650	34014	7.31
6	22.06.2022	April & May	2350	20020	8.52
	Total		16890	137151	8.12



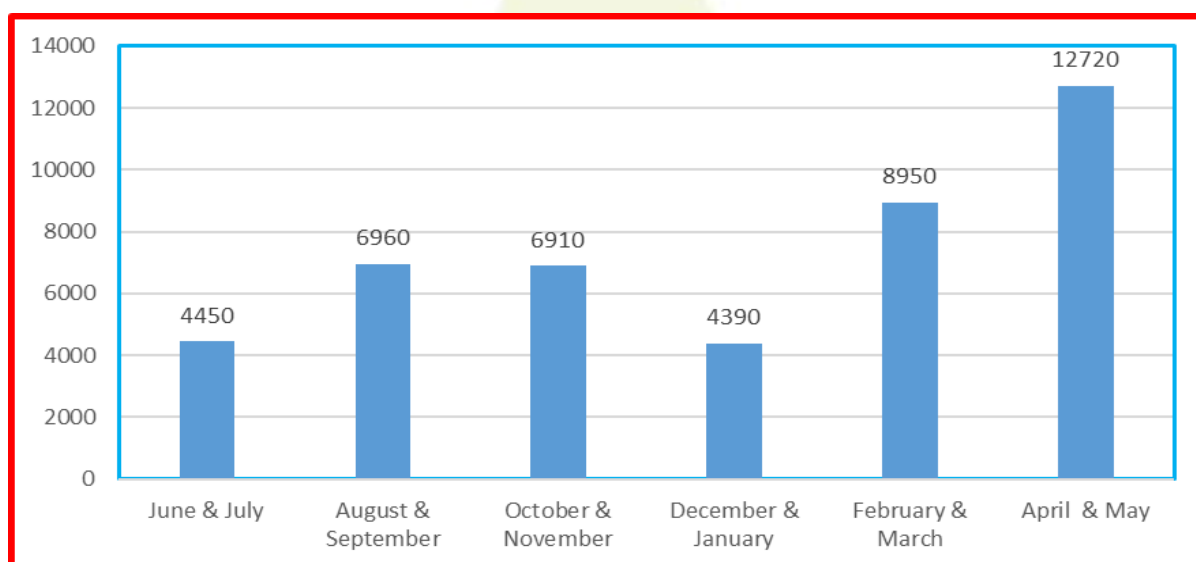
Bi Monthly Energy Consumption

4.Service No 06 222 207 13 36 KW 3 Phase Tariff LM 2B1					
Sl.No	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	24.08.2021	June & July	3880	27854	7.18
2	23.10.2021	August & September	5510	37713	6.84
3	22.12.2021	October & November	4620	32315	6.99
4	24.02.2022	December & January	3310	24364	7.36
5	21.04.2022	February & March	1700	14692	8.64
6	24.06.2022	April & May	11271	72507	6.43
	Total		30291	209445	6.91



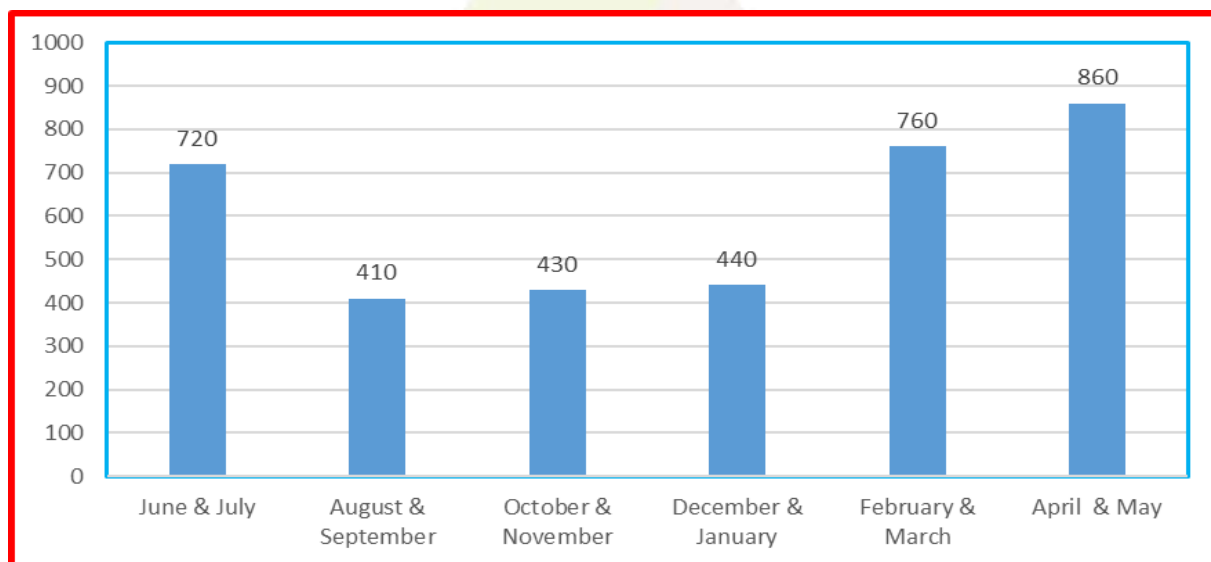
Bi Monthly Energy Consumption

5.Service No 06 222 207 14 48 KW 3 Phase Tariff LM 2B1					
Sl.No	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	24.08.2021	June & July	4450	32783	7.37
2	23.10.2021	August & September	6960	47949	6.89
3	22.12.2021	October & November	6910	47683	6.90
4	24.02.2022	December & January	4390	32331	7.36
5	21.04.2022	February & March	8950	60030	6.71
6	24.06.2022	April & May	12720	82335	6.47
	Total		44380	303111	6.83



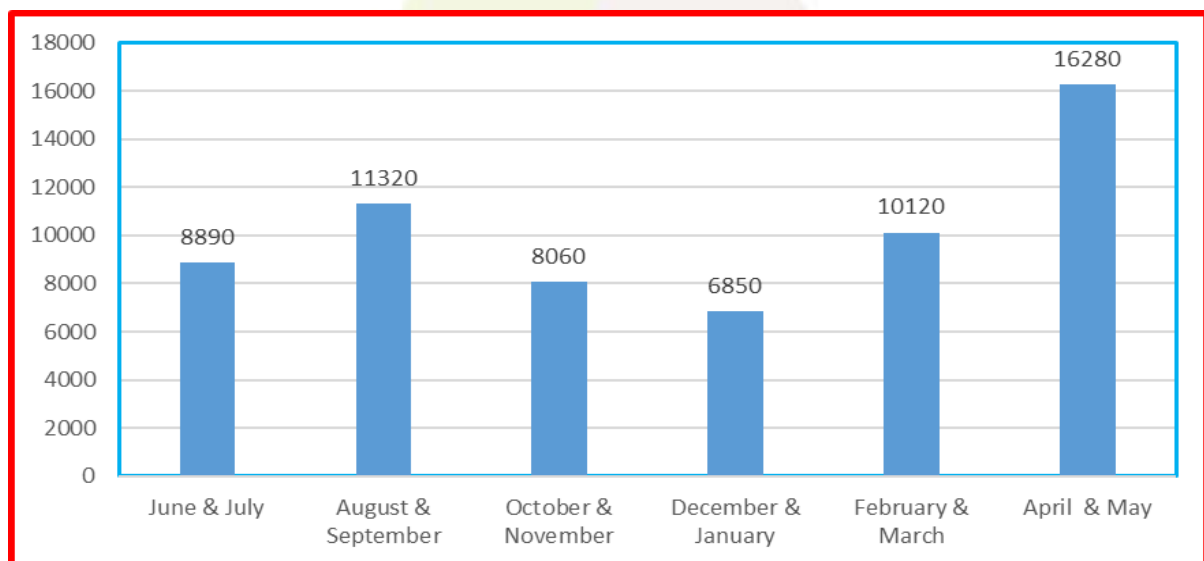
Bi Monthly Energy Consumption

6.Service No 06 222 207 15 5.99 KW 3 Phase Tariff LM 2B1					
Sl.No	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	24.08.2021	June & July	720	5085	7.06
2	23.10.2021	August & September	410	3213	7.84
3	22.12.2021	October & November	430	3322	7.73
4	24.02.2022	December & January	440	3383	7.69
5	21.04.2022	February & March	760	5339	7.03
6	24.06.2022	April & May	860	5936	6.90
	Total		3620	26278	7.26



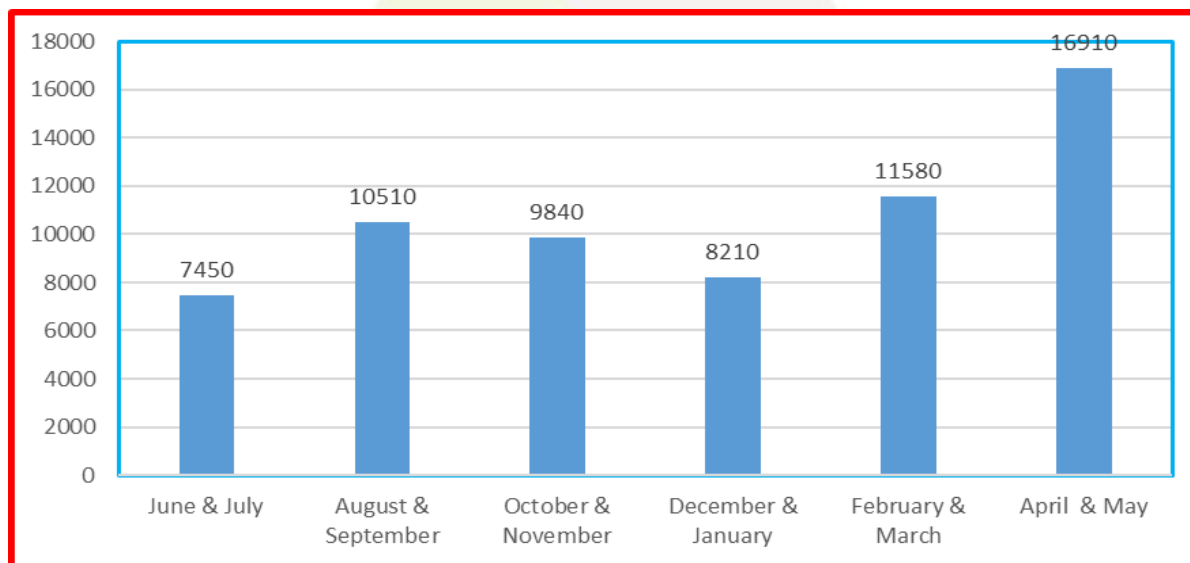
Bi Monthly Energy Consumption

7.Service No 06 222 207 16 40.08 KW 3 Phase Tariff LM 2B1					
Sl.No	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	24.08.2021	June & July	8890	58827	6.62
2	23.10.2021	August & September	11320	73475	6.49
3	22.12.2021	October & November	8060	53732	6.67
4	24.02.2022	December & January	6850	46415	6.78
5	21.04.2022	February & March	10120	67534	6.67
6	24.06.2022	April & May	16280	111381	6.84
	Total		61520	411364	6.69



Bi Monthly Energy Consumption

8.Service No 06 222 207 17 48 KW 3 Phase Tariff LM 2B1					
Sl.No	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	24.08.2021	June & July	7450	50853	6.83
2	23.10.2021	August & September	10510	69436	6.61
3	22.12.2021	October & November	9840	65379	6.64
4	24.02.2022	December & January	8210	55454	6.75
5	21.04.2022	February & March	11580	75920	6.56
6	24.06.2022	April & May	16910	110214	6.52
	Total		64500	427256	6.62



Bi Monthly Energy Consumption

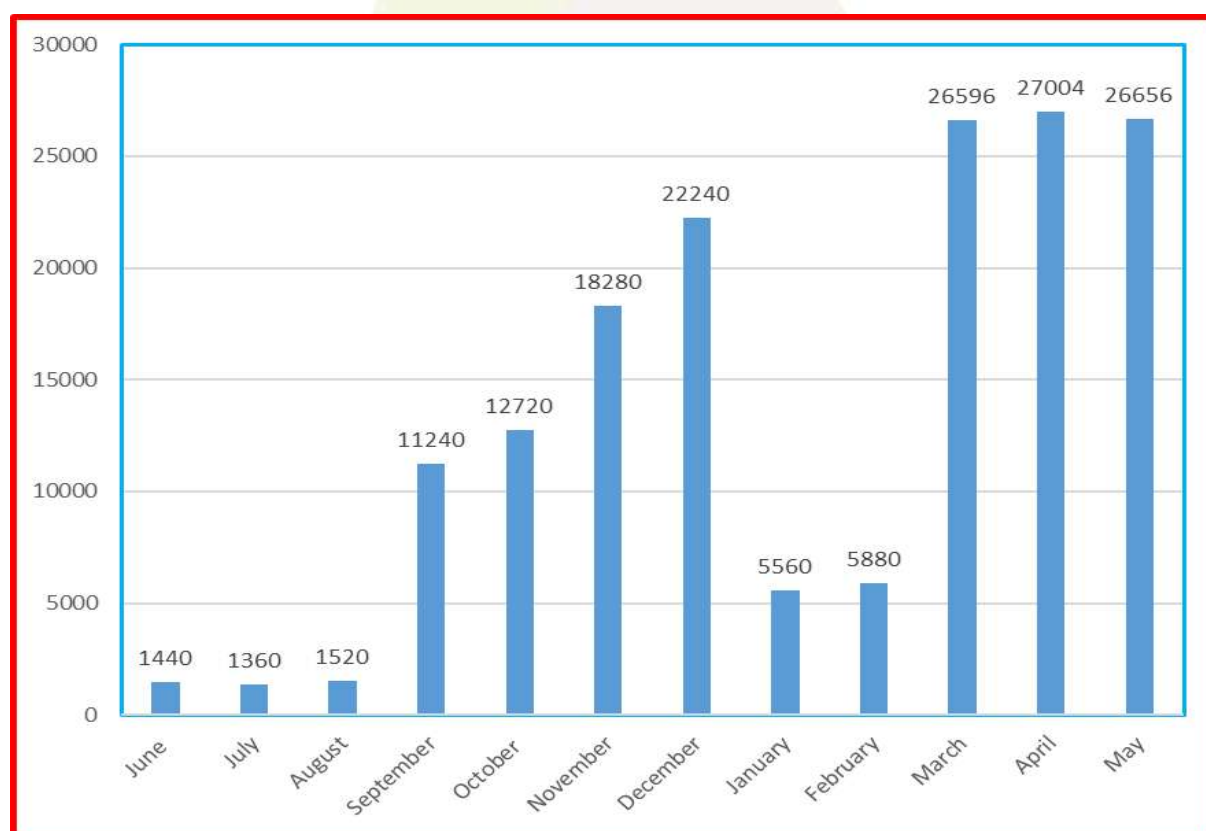
5. TNEB Electrical yearly energy consumption in the Men's hostel with respect to each service number

Sl.No	Service number	Tariff	Energy consumption in units (KWH)	Load in KW
1	06 222 207 26	LM2B2	49340	15
2	06 222 207 27	LM2B2	3440	13.73
3	06 222 207 28	LM2B2	1890	4
4	06 222 207 29	LM2B2	3800	3
5	06 222 207 30	LM61	10440	1.75
6	06 222 207 31	LM2B2	4560	3
7	06 222 207 32	LM2B2	3670	1.75
8	06 222 207 33	LM2B2	30070	21
9	06 222 207 34	LM2B2	48740	17
10	06 222 207 35	LM2B2	7440	27
11	06 222 207 36	LM2B2	3900	5.6
12	06 222 207 37	LM2B2	35040	12
13	06 222 207 38	LM2B2	14090	8
14	06 222 207 39	LM2B2	2650	4.52
15	06 222 207 350	LM51	10030	10
16	06 222 207 1046	LM2B2	14250	12
17	06 222 207 1101	LM2B2	37320	17
18	06 222 207 1289	LM2B2	96200	34
19	06 222 207 1519	LM61	1000	10
20	06 222 207 1874	LM2B2	15111	50
21	06 222 207 1875	LM 51	4000	4
	Total		396981	274.35

Service wise yearly energy consumption

6. TNEB Electrical Energy consumption in the Women's hostel

Service No 06 222 207 1045 85.5 KW 3 Phase Tariff LM2B2					
Sl. No.	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	30.06.2021	June	1440	16527	11.48
2	31.07.2021	July	1360	15900	11.69
3	31.08.2021	August	1520	17163	11.29
4	30.09.2021	September	11240	93780	8.34
5	30.10.2021	October	12720	105444	8.29
6	30.11.2021	November	18280	149271	8.17
7	31.12.2021	December	22240	180492	8.12
8	31.01.2022	January	5560	49110	8.83
9	28.02.2022	February	5880	51633	8.78
10	31.03.2022	March	26596	214811	8.08
11	30.04.2022	April	27004	217934	8.07
12	30.05.2022	May	26656	215307	8.08
	Total		160496	1327372	8.27



Month wise Energy Consumption

7. DG set Electrical Energy consumption

Electrical Energy Consumption from DG sets-14,535 units

DG sets in Aided Section

SI No	Block	Power Capacity
1	Main Gate	30 KVA
2	MBA	125 KVA
3	Controller of exam	63 KVA
4	Zoology, ARABIC	63 KVA
5	Maths, Economis	63 KVA
6	Principal Office, Aided office	63 KVA
7	Physics, Chemistry	63 KVA
8	Commerce, English	63 KVA
9	Computer science	125 KVA

DG sets in Self Finance Section

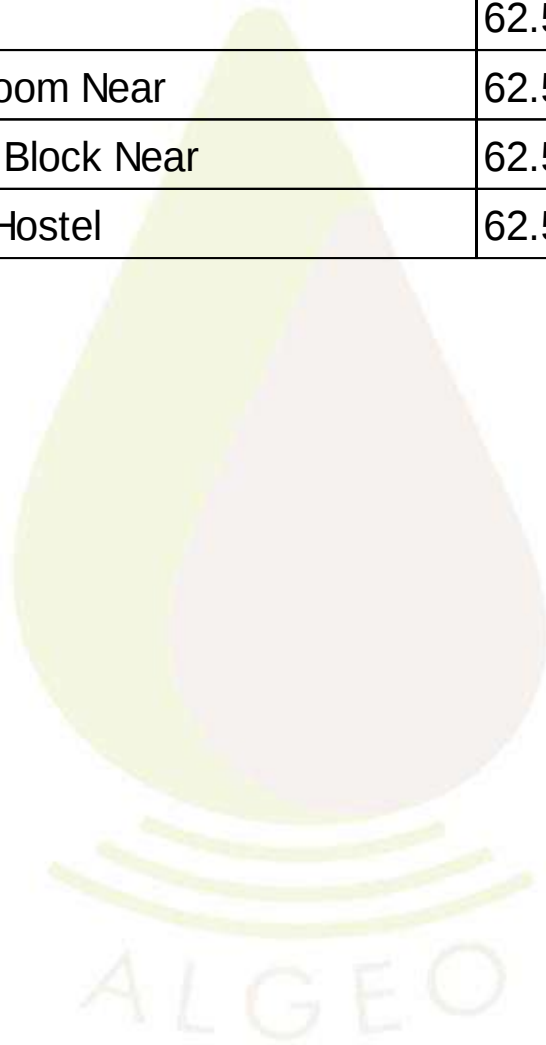
SI No	Block	Power Capacity
1	Information Technology	125 KVA
2	Fashion Technology	63 KVA
3	English, Maths, Tamil	63 KVA
4	Microbiology, Biotech	63 KVA
5	BBA, Physics	63 KVA
6	Auditorium, Commerce, Hotel Management	125 KVA

DG sets in women's Hostel

SI No	Block	Power Capacity
1	Dubai Block, Dubai Alumini Block	120 KVA
2	UGC Block , New mess	83 KVA

DG sets in Men's Hostel

SI No	Block	Power Capacity
1	Mess 5	63 KVA
2	Mess 5	62.5 KVA
3	Motor room Near	62.5 KVA
4	Burunei Block Near	62.5 KVA
5	Sports Hostel	62.5 KVA



8.Total Conventional Electrical Energy Consumption details

	Electrical Energy Consumption -TNEB and DG	
	TNEB-College	units
1	HT service	189941
2	LT service	357068
	TNEB-Hostel	
1	Men's Hostel	396981
2	Women's Hostel	160496
	TNEB Total	1104486
	DG Set	
1	Both College and Hostel	14535
	Total	1119021

9. Renewable Electrical Energy-Solar Electrical energy Consumption

Installed capacity -50KW

Energy Generation from installation-1,69,468 units

Energy Generation during the year 2021-2022-40,019 units



10.Total Electrical Energy Consumption -Renewable and conventional

	Total Electrical Energy Consumption - Renewable and Conventional	
	TNEB-College	units
1	HT service	189941
2	LT service	357068
	TNEB-Hostel	
1	Men's Hostel	396981
2	Women's Hostel	160496
	DG Set	
1	Both College and Hostel	14535
	Solar	
	Hostel	40019
	Total	1159040

11. Conventional Thermal Energy consumption - LPG

- LPG cylinders used- commercial cylinders of 19 kgs capacity
- Total LPG consumption during the year 2021-2022- 20,995 Kgs

12. Conventional Thermal Energy consumption- Diesel

Diesel Consumption for transport during the year 2021-2022 – 14,690 Litres



13.Renewable Thermal Energy-Solar Water Heater

Solar Water Heater installed-1000 LPD- one

500 LPD- Four

Total Capacity-3,000 LPD



14. Renewable Thermal Energy- Biogas

Biogas plants installed- 25 M3 capacity X 2(Each one at Men & Women Hostel)

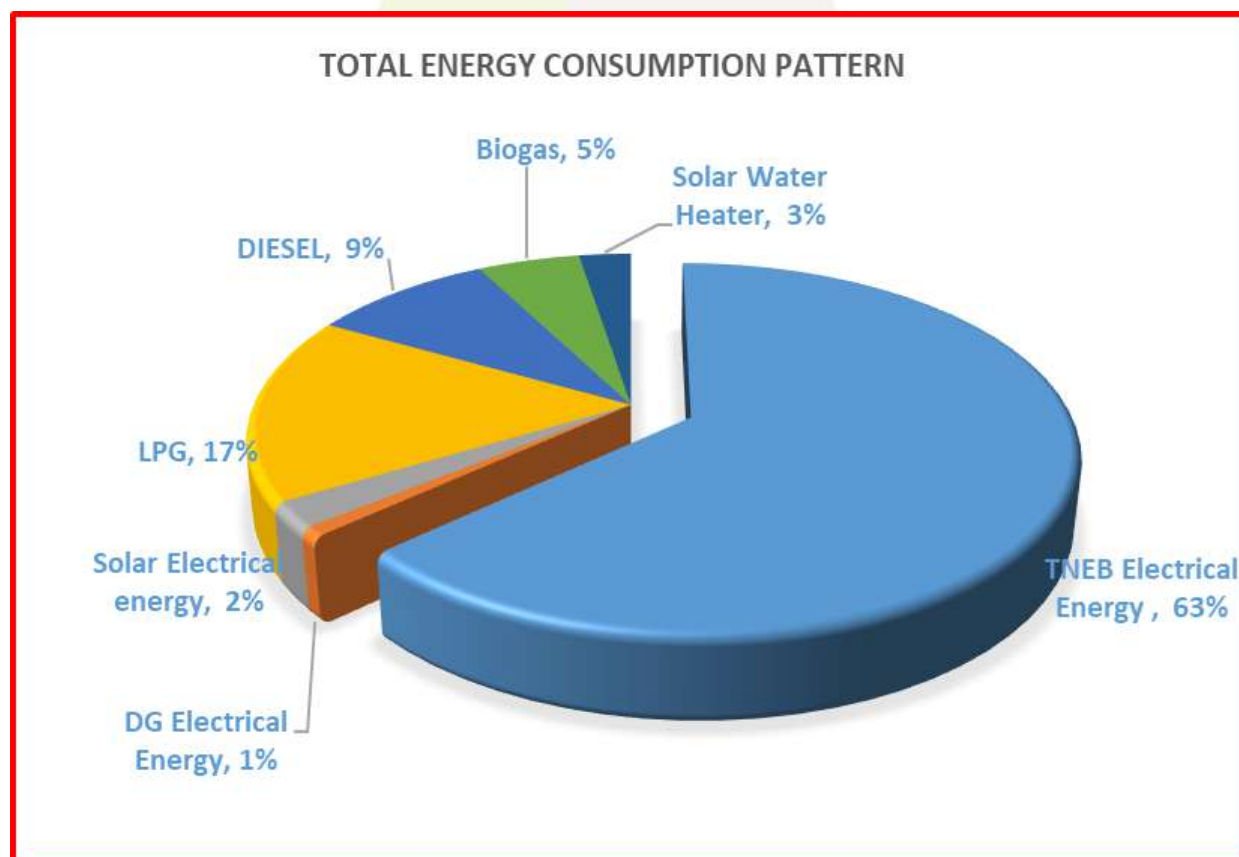
35 M3 capacity X 1(Men Hostel)



15.Total Energy consumption

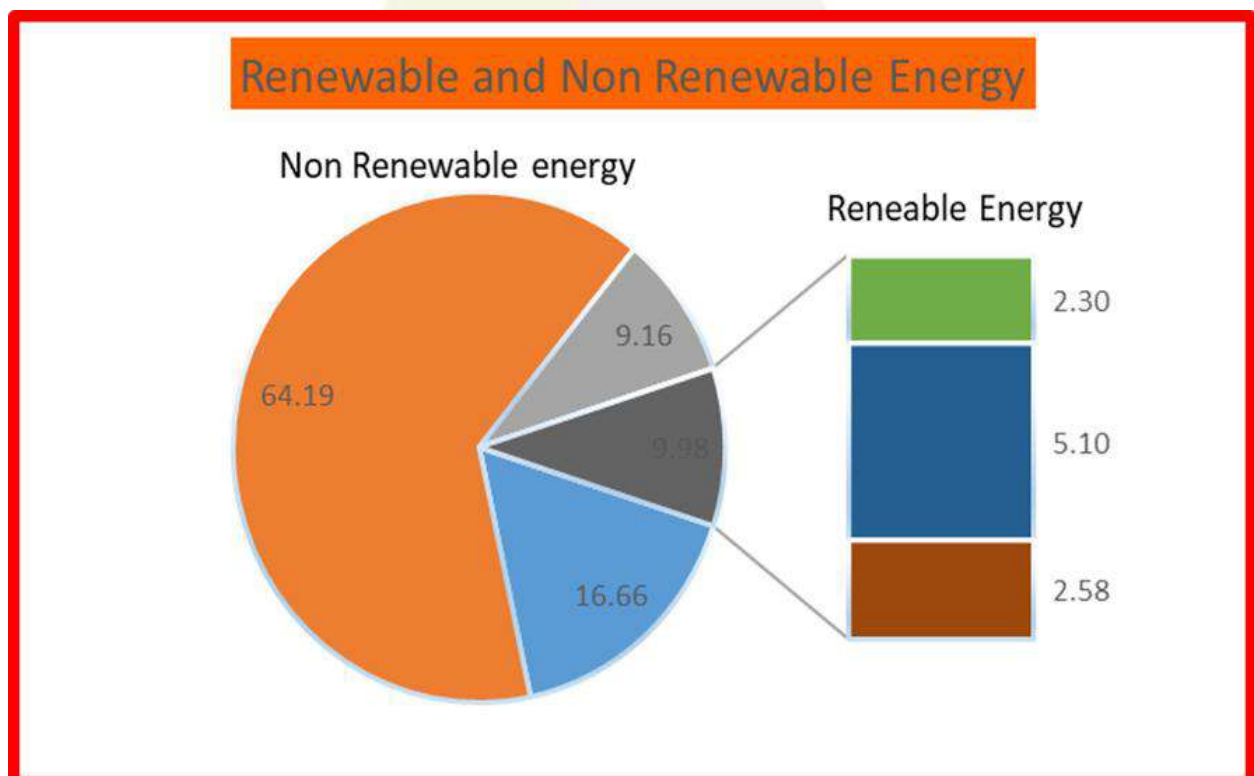
Electrical (Conventional & Renewable) and Thermal (Conventional & Renewable)

SL.NO	TYPE OF ENERGY	ENERGY -GCAL		Percentage
1	TNEB Electrical Energy	949.86	0.633572123	63.36
2	DG Electrical Energy	12.50	0.008337789	0.83
3	Solar Electrical energy	34.42	0.02295631	2.30
3	LPG	249.84	0.166648049	16.66
4	DIESEL	137.40	0.091645284	9.16
5	Biogas	76.50	0.051026858	5.10
6	Solar Water Heater	38.70	0.025813587	2.58
	Total	1499.2		100.00



16.Renewable and Non-Renewable (Conventional) energy distribution

ENERGY CONSUMPTION	PERCENTAGE		Total
NON RENEWABLE			90.02
LPG	16.66		
TNEB AND DG ELECTRICAL ENERGY	64.19		
DIESEL	9.16		
RENEWABLE			9.98
SOLAR Electrical	2.30		
Biogas	5.10		
Solar Water Heater	2.58		



17.The energy conservation measures followed

- Lights and fans are switched off by the students whenever they are out of hostel rooms.
- Work supervisor and electrician regularly check the usage of lights, fans and all other energy sources during and out of the College hours.
- Replacing conventional electrical light fittings with energy efficient Light-Emitting Diode (LED) bulbs is going on as continuous process.
- The fans, lights, air-conditioners and other electronic and electrical equipments are switched off when not in use.
- At the end of every practical session, Computer monitors are switched off.
- Periodical maintenance and overhauling of generators are being carried out.
- Computers are switched to sleep mode or hibernate mode automatically when not in use.
- Staff and Students are made aware of using public transport and College buses and individual vehicle usage is being reduced.
- Soft copies are maintained instead of hard copies, to reduce power consumption and paper.
- Periodical maintenance of UPS and Battery systems are carried out.
- Auto Level controller is provided in all water storage tanks to avoid overflow of water and to save energy.
- Maximum utilisation of day lights at the hostels and College.

18.Major Electrical loads

UPS load details

JAMAL MOHAMED COLLEGE (AIDED)

Sl.No	DEPARTMENT	CAPACITY & VDC	MAKE	TYPE	FLOOR/ PLACE
1	LIBRARY (JMC)	3KVA/96VDC	NEMERIC	DIG	GROUND FLOOR
2	ATTENDANCE	2KVA/24VDC	KEVIN	DIG	GROUND FLOOR
3	SECURITY GATE	650VA/12VDC	ASSEMBLING	REG	GROUND FLOOR
4	AUM IBRAHIM BLOCK (C.S AIDED)	10KVA/360VDC	GLOBAL	REG	GROUND FLOOR
		1KVA/36VDC	CONSUL	DIG	GROUND FLOOR
5	DEAN OFFICE	850VA/12VDC	SUKAM	DIG	DEAN OFFICE
6	MATHEMATICS	10KVA/240VDC	CONSUL	DIG	1st FLOOR
7	SECRETARY SIR ROOM	2KVA/24VDC	KEVIN	REG	GROUND FLOOR
8	COLLEGE OFFICE	2KVA/96VDC	CONSUL	REG	GROUND FLOOR
9	COLLEGE OFFICE	6KVA/120VDC	RPC	REG	GROUND FLOOR
10	PRINCIPAL ROOM	1450VA/24VDC	ASSEMBLING	REG	GROUND FLOOR
11	ARABIC	6KVA/120VDC	GLOBAL	REG	1st FLOOR
12	ECONOMICS	1KVA/36VDC	NUMERIC	DIG	1st FLOOR
13	PHYSICS	2KVA/72VDC	ASSEMBLING	DIG	1ST FLOOR
14	CHEMISTRY	5KVA/120VDC	CONSUL	REG	GROUND FLOOR
15	WI FI & CCTV UPS	5KVA/48VDC	EXIDE	REG	1st FLOOR
16	ERP ROOM	5KVA/48VDC	EXIDE	REG	GROUND FLOOR
17	INTERCOM DEPT	1450VA/24VDC	KEVIN	REG	GROUND FLOOR
18	GUESTHOUSE	850VA/12VDC	ASSEMBLING	REG	1st FLOOR
19	UGC NODAL OFFICE	1450VA/24VDC	KEVIN	REG	1st FLOOR
20	CS DEPARTMENT	850VA/12VDC	KEVIN	REG	GROUND FLOOR
21	PRINCIPAL ROOM	2KVA/96VDC	CONSUL	DIG	GROUND FLOOR

(KHAJAMIAN HOSTEL)

S.No	DEPARTMENT	CAPACITY & VDC	MAKE	TYPE	FLOOR/ PLACE
1	KHAJAMIAN NET LAB				
2	KHAJAMIAN OFFICE	3KVA/36VDC	ASSEMBLING	REG	GROUND FLOOR
3	AUDITORIUM	3KVA/36VDC	ASSEMBLING	REG	GROUND FLOOR
4	1st MESS	650VA/12VDC	KEVIN	REG	GROUND FLOOR
5	2nd MESS	650VA/12VDC	KEVIN	REG	GROUND FLOOR
6	3rd MESS	650VA/12VDC	KEVIN	REG	GROUND FLOOR
7	4th MESS	650VA/12VDC	KEVIN	REG	GROUND FLOOR
8	5th MESS	650VA/12VDC	KEVIN	REG	GROUND FLOOR
9	6th MESS	650VA/12VDC	KEVIN	REG	GROUND FLOOR

**JAMAL MOHAMED COLLEGE UPS DETAILS
(SELF FINANCE)**

S.No	DEPARTMENT	CAPACITY & VDC	MAKE	TYPE	FLOOR/ PLACE
1	NEW MBA ALMANHAL BLOCK				
		850VA/12VDC	KEVIN	REG	FRONT OFFICE
2	MBA JEDDAH ALUMNI BLOCK	5KVA/120VDC	CONSUL	REG	1st FLOOR
		20KVA/360VDC	CONSUL	DIG	GROUND FLOOR
		2KVA/96VDC	CONSUL	DIG	2nd FLOOR
		5KVA/192VDC	CONSUL	REG	GROUND FLOOR
		1.5KVA/24VDC	KEVIN	REG	GROUND FLOOR
3	SELF FINANCE OFFICE (MEN)	2KVA/96VDC	NEMERIC	DIG	MEN S.F OFFICE
		1KVA/36VDC	NEMERIC	DIG	MEN S.F OFFICE
		2KVA/96VDC	NEMERIC	DIG	WOMEN COM LAB
		1KVA/36VDC	NEMERIC	DIG	MEN S.F OFFICE
4	CONTROLLER OFFICE				
		6KVA/120VDC	GLOBAL	REG	1st FLOOR
5	IT DEPARTMENT	3KVA/96VDC	CONSUL	DIG	1 ST FLOOR
		1KVA/36VDC	NEMERIC	DIG	1st FLOOR
		5KVA/240VDC	NUMERIC	DIG	2nd FLOOR
6	STUDENT BROWSING CENTRE	5KVA/240VDC	CONSUL	DIG	1st FLOOR
7	MSW	1KVA/36VDC	NUMERIC	DIG	GROUND FLOOR
8	BIOTECH & MICRO BIOLOGY	1.5KVA/24VDC	KEVIN	REG	GROUND FLOOR
9	HUSAINUDEEN HALL	1450V A/24VDC	KEVIN	DIG	GROUND FLOOR
10	SF WOMEN OFFICE	1450VA/24VDC	KEVIN	REG	GROUND FLOOR
11	A/C AUDITORIAM	1450VA/24VDC	KEVIN	DIG	GROUND FLOOR
12	MANAGEMENT OFFICE	1KVA/36VDC	CONSUL	DIG	GROUND FLOOR
13	BIO INFORMATICS	1KVA/36VDC	CONSUL	DIG	1st FLOOR
14	POWER ROOM	850VA/12VDC	KEVIN	REG	GROUND FLOOR

(PG NEW HOSTEL)

S.No	DEPARTMENT	CAPACITY & VDC	MAKE	TYPE	FLOOR/ PLACE
1	PG OFFICE	1450VA/24VDC	ASSEMBLING	REG	GROUND FLOOR
2	OFFICE	1450VA/24VDC	KEVIN	REG	GROUND FLOOR
3	NEW MESS	1050VA/12VDC	KEVIN	REG	GROUND FLOOR
4	OLD MESS	850VA/12VDC	BASS	REG	GROUND FLOOR

AC Load details

DEPT	MAKE	MODEL		No of A.C.
		WINDOW	SPLIT	
Bio-technology	Voltas		4	14
	Voltas			
	O. G		10	
	O. G			
Microbiology	O. G	1	2	11
	O. G			
	Carrier	1		
	Bluestar		7	
Bio-informatics	Onida		4	4
Hotel Mgt	O. G	1		3
	Carrier	1		
	Voltas		1	
GCC	Voltas		4	5
	Daikin		1	
Guest House	Carrier		2	3
	Voltas		1	
Commerce	L.G.		10	14
	Carrier	4		
Zoology	O. G	2		9
	Voltas	1	2	
	LG		3	
	Blue star		1	
Physics	O. G	3		7
	Voltas		1	
	Carrier	2		
	LG		1	
Student Browsing	LG		5	5
I.T. Block	Godrej		12	44
	O. G		5	
	Blue Star		2	
	LG		25	
Principal Room	Carrier	2		6
	LG		1	
	OG		3	
V.P Room	Daikin		1	1
Secretary room	O. G		2	5

	Daikin		2	
	LG		1	
Conference hall	O. G		3	3
Botany Dept	L.G		3	7
	Voltas		2	
	Blue Star		2	
M.B.A	O. G		34	42
	Carrier	1		
	Onida		5	
	Voltas		1	
	LG		1	
Urdu CS Lab	L.G		2	2
COE	Carrier	2		17
	Samsung		1	
	LG		1	
	OG		2	
	Voltas		11	
New M.B. A	O. G		37	44
	Onida		1	
	Blue star		6	
Maintenance	O. G		1	1
Masjid	Voltas		1	11
	OG		10	
Chemistry	Daikin		1	8
	LG		4	
	Carrier	3		
K.M.H.Hostel	O. G		1	20
	LG		2	
	Voltas		1	
	Blue Star		6	
	Carrier		10	
P.G Warden	O. G		3	5
	LG		2	
Computer Science	O. G		8	21
	LG		3	
	Voltas		7	
	Blue star Cassete		1	
	Vestar		2	
A.C. Auditorium	OG		20	35
	LG		1	

	Voltas		2	
	Blue Star		5	
	Blue Star Cassete		1	
	Daikin cassette		6	
Hussain din Hall	LG		7	7
English	LG		3	3
History	LG		2	3
	Daikin		1	
Tamil	LG		2	2
FT	LG		2	5
	Blue star		3	
PD	LG		2	2
Arabic	LG		1	2
	Voltas		1	
College Office	LG		9	9
Management Office	LG		1	1
Purchase	Voltas		1	1
Economics	LG		6	7
	Onida		1	
Hindi	LG		1	1
Maths	LG		3	6
	Voltas		1	
	Godrej		2	
Nutrition	Samsung		1	2
	Voltas		1	
JMC IAS Academy	Blue star		2	2
English S.F	Voltas		3	3
Students Counselling Centre	O.G		1	1
N.M.K Auditorium	Amtrex(Ductablesplit)		2	12
	Daikin Cassette		1	
	L.G		2	
	Daikin		2	
Doctor's Room	Voltas		1	1
U.G.C			1	1
Nodal office			1	1
Director office			1	1

Lighting Load

	Description	Numbers	Watts	Total watts	Lighting Load in Watts	LED Load in Watts
1	L.E.D. Tube Lights	1976	20	39520	39520	39520
2	Ordinary tube lights	1050	40	42000	42000	0
3	ceiling fan	2069	60	124140	0	0
4	wall mount fan	55	60	3300	0	0
5	exhaust fan	25	120	3000	0	0
6	1*1 LED ceiling fitting	258	14	3612	3612	3612
7	2*2 LED ceiling fitting	145	33	4785	4785	4785
8	C.F.L Bulb	40	11	440	440	
9	L.E.D Street Lights	85	20	1700	1700	1700
10	FOCUS LAMP (INDOOR AND OUTDOOR STADIUM)					
	(i) 400w Metal Aloyed	60	400	24000	24000	24000
	(ii) 250 w Metal Aloyed(indoor)	30	250	7500	7500	7500
	(iii) 250w Metal Aloyed(outdoor)	15	250	3750	3750	3750
11	L.E.D. Bulb	12	9	108	108	108
12	C.F.L 2*2 Fitting	22	72	1584	1584	
	Total				128999	84975

- Total Connected Load- 1012.91 KW
- Total Lighting Load- 129 KW
- LED lights-2476 numbers
- LED lighting load- 84.97 KW
- Lighting load on total load -12.73 %
- LED lighting load on total Lighting load -65.86%
- LED lighting load on total load-8.39 %

19. AUDIT FINDINGS & ENERGY SAVING POTENTIAL

19.1 Findings

- Annual electricity consumption from TNEB GRID is 11,04,486 units during the year 2021-2022.
- Electrical Energy consumption from Diesel Generator – 14,535 units.
- Solar Power Electrical energy consumption- 40,019 units
- Total Electrical Energy consumption from EB, DG and Solar – 11,59,040 units.
- LPG consumption -20.995 Kgs
- Diesel Consumption for transport -14,690 Litres
- Biogas generation- 15,300 M³
- Replacement of Conventional lights with Energy Efficient LED lights are done on phased manner
- Additional Solar power plant shall be planned in future for HT service.
- More Green energy utilisation shall be planned in the coming years
- Conduct more awareness programs on importance of energy saving for students and staff
- Remaining Conventional Tube lights shall be replaced with LED tube lights in a phased manner
- 5 Star rated Energy efficient electrical equipments shall be procured in future

19.2 Renewable Energy

- Solar power plant shall be planned in a phased manner in future to achieve 50 % renewable energy target
- 50 KW Solar Power plant is utilised to the maximum
- 1KW solar plant generates 1500 units per year, Avoids 0.79 KG CO₂ per unit,

Energy saving potentials

1. Conventional tube lights shall be replaced with LED tube lights

Conventional tube light (with electronic choke) energy consumption-40 watts/hr

LED Tube lights energy consumption-20 watts/ hr

Savings per tube light -20 watts/hr

No of hours usage per day in the hostel– 10 hrs

No of days hostel occupied with students-275 days

Energy savings per tube light per year - $275 \times 10 \times 20 = 55,000 \text{wh} = 55 \text{ units}$

Average energy cost- Rs 8/unit

Cost saving per year per tube light- $55 \times 8 = \text{Rs } 440$

Cost savings per month-Rs 36.6

Approximate Cost of LED tube light -Rs 200

Payback period-5.5 months

Replacement cost for 100 LED tube lights-Rs $200 \times 100 = \text{RS } 20,000$

Cost savings for 100 LED tube lights-Rs 44,000 / year

Energy savings for 100 LED tube lights-5,500 units/ year

Payback period-5.5 months

2. Conventional fans shall be replaced with energy efficient fans

Conventional FAN energy consumption-75 watts/hr

ENERGY efficient fan energy consumption-28 watts/ hr

Savings per fan -47 watts/hr

No of hours usage per day in the hostel– 16 hrs

No of days hostel occupied with students-275 days

Energy savings per fan per year - $275 \times 16 \times 47 = 206,800 \text{wh} = 207 \text{ units}$

Average energy cost- Rs 8 /unit

Cost saving per year per FAN- $207 \text{ units} \times 8 = \text{Rs } 1656$

Cost saving per month-Rs 138

Cost of ENERGY EFFICIENT FAN -Rs 2800

Payback period 20 months

Replacement cost for 100 Nos. ENERGY EFFICIENT FAN-Rs $2,800 \times 100 = \text{RS } 2,80,000$

Cost savings for 100 Nos. ENERGY EFFICIENT FAN -Rs 1,65,600 / year

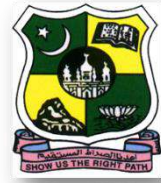
Energy savings for 100 Nos. ENERGY EFFICIENT FAN -20,700 units/ year

Payback period 20 months

JAMAL MOHAMED COLLEGE (*Autonomous*)

*COLLEGE WITH POTENTIAL FOR EXCELLENCE
Accredited (3rd Cycle) with 'A' Grade By NAAC
(Affiliated to Bharathidasan University)*

**TIRUCHIRAPPALLI – 620020,
TAMILNADU, INDIA.**



ENVIRONMENTAL AUDIT REPORT 2021-2022



AUDIT/REPORT BY



ALCHEME GREEN ENERGY COMPANY

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ACKNOWLEDGEMENT

We at Alcheme Green Energy Company, Madurai are thankful to the Principal for giving us the opportunity to carry out Environmental audit at Jamal Mohamed College Trichy -620 020. Alcheme Green Energy Company team is also thankful to all other supporting Officers / Staffs of the above institute for their wholehearted support, hospitality and the courtesy extended to the Audit team during the course of the visit.

The following officers from Alcheme Green Energy Company under the guidance of Mr. C. Jebaraj, B.Tech., have carried out the Environmental Audit.

Name	Qualifications	Certification Number
Mr. C. Jebaraj	B.Tech., PDGEM., DIS., BEE Certificated Energy Auditor, IRCA Certified Lead Auditor - OHSMS Internal Auditor - QMS CII Certified Carbon footprint Professional	EA-9847
Mr. S. Lakshmana Kumaran	B. Tech., MSc.,(Env. Science), MBA., IRCA Certified Lead Auditor ISO 14001 EMS	UID - 351851

The following staff from the Institution were participated in the audit process

Name	Designation
Dr. D. I. George Amalarethnam	Associate Professor of Computer Science Coordinator, IQAC
Dr. A. Jafar Ahamed	Associate Professor of Chemistry Core Member, IQAC
Dr. S. Nagoor Gani	Associate Professor of Tamil Coordinator, Khajamian Hostel
Dr. B. Sirajudeen	Associate Professor of Tamil In-Charge, Campus Maintenance
Mr. M. Shaik Mohideen	Electrician – (Training Instructor- Sp. Gr.)


21/7/22



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Summary of Environment Audit

Environment audit of Jamal Mohamed College and its Hostel was carried by Alcheme Green Energy Company. Audit team has gone through the data related to Water and Electrical Energy, Waste generation, Waste Management, Waste Recycling and Reuse, Green Belt Development of the Institution both inside and outside the campus. The team also carried out the study of Pollution abatement measures, Rainwater harvesting, Water and Energy Conservation measures taken to reduce the pollution, noise level, Greenhouse gas emission and maintain Ambient Air quality.

During the visit, it is observed that cleanliness in the campus is well maintained through proper disposal of wastes, utilization of eco-friendly supplies and effective recycling program. The concept of eco-friendly culture is disseminated among the students through various seminars/workshops and community-oriented programs. The Institution strictly follows reduce, reuse and recycle method to limit energy usage and partially replace non-renewable energy sources with renewable energy resources.

The environment audit report is a very powerful and valuable communications tool to use while working with various stakeholders who need to be convinced that systems and procedures in place are suited to cope with natural changes and modifications.

It is hoped that the results presented in the environment audit report will serve as a guide for educating the College community on the existing environment related practices and resource usage at the College as well as spawn new activities and innovative practices.

The audit outputs and recommendations are summarised as follows:

Noteworthy activities

- Clean, Green and plastic free campus
- Excellent Waste management system
- Milk for the hostel mess is brought through milk cans only. No pocket milks
- Biogas generation from Night soil and food waste
- Renewable energy utilisation both thermal and electrical
- Very good exhaust system arrangement has been made at Women's Hostel's incinerator to disperse the smoke and vapours to improve Indoor Air Quality
- Excellent drinking water distribution system throughout the College and Hostels

The audit outputs and recommendations are summarised as follows:

- Air pollution impact on Ambient Air quality is negligible since the quantity of fuel used for combustion in the institution is very less
- Noise levels inside the campus are within the prescribed limit
- Very good initiative is taken by the institution to reduce paper consumption, collection of waste paper and disposal for recycling
- Lot of initiatives are taken to conserve Water and Energy by the Institution.
- Flow meters are to be provided for better water management
- Total water consumption for Jamal Mohamed College and Hostel –238 KL/Day
- Electrical Energy consumption from TNEB GRID alone –11,04,486 units
- Diesel Generator electrical energy consumption- 14535 units
- Solar Power electrical energy consumption-40019 units
- Total Electrical Energy consumption is 11,59,040 units
- Total Green House Gas Emission is 1456.4 t CO₂e
- Green House gas offset by grown up trees is 16.1 t CO₂e
- Net Green House Gas emission is 1440.3 t CO₂e
- Green chemistry procedure is followed in the department of chemistry to carry out research work thereby reducing the use of harmful solvents

We are happy to submit this detailed Environmental audit report to the Jamal Mohamed College



For Alcheme Green Energy Company
Madurai



1. Introduction

1.1 Environmental Policy

Jamal Mohamed College has well formulated Environmental Policy to guide all its activities.

The main objectives are as follows:

- ❖ To Reduce, Reuse, and Recycle the resources consumed by our institution
- ❖ To achieve sound environmental practices across our entire operation.
- ❖ To minimise our waste and reduce our water consumption wherever possible.
- ❖ To create awareness among our faculty members and students, training them to meet our objectives.

The Institution vouchsafes:

- ❖ Identifying the environmental impacts and aspects of operations and ensuring that we meet our compliance obligations.
- ❖ Establishing environment programs that are consistent with our commitment to the continual improvement of the environment management system.
- ❖ Compliance with applicable environmental policies and prevention of pollution by applying the best available practices



2. WATER

2.1 Water usage at Jamal Mohamed College

Total number of students studied during the academic year 2021-2022: 12,225

Teaching & non-Teaching staff in the institution during the academic year 2021-2022: 774

Total number of stake holders: 12,999

Water for college and hostel

Corporation water through Tanker Lorry for college - 6,000 litres/day

Corporation water through Tanker Lorry for Men's Hostel - 60,000 litres/day

Corporation water through Tanker Lorry for Women's Hostel - 60,000 litres/day

Borewell water for Hostel and college – 1,12,000 litres/day

Total water usage - 2,38,000 litres/day

Main water uses in the College campus are Drinking, Rest room, Canteen and Lab

Water usage in the College- 90 KL / Day

Water usage per day per stakeholder in the college – 6.92 litres

Water usage at College

Sl. No	Place	Water usage Quantity Litres / Day
1	Drinking	13,000
2	Rest room	48,000
3	Canteen	12,000
4	Lab	8,000
5	Garden	8,000
6	Construction	1,000
	Total	90,000

Waste water generation in the college – 68 KL/day

Water usage at Hostels

Number of students and staff residing in the hostel in the year 2021-2022: 2106

Main water uses in the Hostel are Drinking, Washing of clothes, Cooking & Vessel cleaning and for Rest room

Water usage at Hostels (Men and Women) - 148 KL / Day

Water consumption per day per stakeholder in the hostel – 70.27 litres

Water usage at Hostel(Men and Women)

Sl. No	Place	Water usage Quantity Litres / Day
1	Drinking	4000
2	Cooking	4000
3	Rest room	42,000
4	Bathing	38,000
5	Clothes washing	48,000
6	Vessel Cleaning	12,000
	Total	148,000

Waste water generation in the Hostels – 140 KL /day

3. Electrical Energy

3.1 ELECTRICAL ENERGY CONSUMPTION TNEB and DG IN THE COLLEGE AND HOSTEL in 2021-2022

	Electrical Energy Consumption - TNEB and DG	
	TNEB-College	units
1	HT service	189941
2	LT service	357068
	TNEB-Hostel	
1	Men's Hostel	396981
2	Women's Hostel	160496
	DG Set	
1	Both College and Hostel	14535
	Total	1119021

Total Electrical Energy consumption from TNEB grid and DG in the College and Hostel 11,19,021 units

Electrical Energy consumption per stakeholder per year – 86.08 units/year

4. FUEL CONSUMPTION

4.1 LPG

LPG gas is used in the hostel for cooking and used in the College lab for heating

LPG cylinders used- commercial cylinders of 19 kgs capacity

- Total LPG consumption during the year 2021-2022- 20995 KGs

5. Waste Generations and Management

5.1 Liquid and Solid Waste Generation

- Waste water generation in the College - 68 KL /day
- Waste water generation in the Hostel – 148 KL /day

College

- Biodegradable—<5 kg/day

Office

- Non-biodegradable —< 0.5kg/day

College Canteen

- Biodegradable —< 15 kg/day
- Non-biodegradable —<0.5kg/day
- Aluminium foil —<0.1kg/day

Hostel

- Biodegradable(Food waste) – 100-300 kg/day
- Non-biodegradable – <0.5kg/day

Open area

- Biodegradable (Dry leaves)- 10-20 Kgs/Day

Plastic waste

- Less than 1Kg per day

e-Waste

- Less than 200 kgs/year

5.2 Waste Management

5.2.1 Liquid waste Management

- The night soil produced by the hostels are directed to a total of three biogas plants from which fuel gas(Biogas) is produced.
- College has a large mechanical filtering system to process grey water



The grey water produced is preliminarily treated and filtered through a stagnation filter assisted by live herbaceous plants which absorb nitrate, phosphate and other pollutants. Then the treated water is let into the coconut farm for irrigation. RO plant reject from industrial type is used for gardening purpose.

5.2.2 Bio-degradable waste management

- ❖ Bio-Degradable and non-biodegradable waste are collected in separate bins provided. ,
- ❖ Compost pit has been constructed to decompose kitchen waste by employing enriched microbial culture as well as vermicompost method
- ❖ Dry leaves are collected separately, dumped in the pits and converted into Bio fertilizer and used as bio fertiliser
- ❖ The egg shell waste are separately dried and powdered in grinder and used as an additive in compost produce. This mixture is used as manure for organic recovery plot, where vegetable are grown without chemical fertilizers.

5.2.3 Plastic Waste Management

- The College has been declared as a 'Plastic Free' zone.
- Milk for the hostel mess is brought through milk cans only. No pocket milks
 - Use of polythene bags, plastic cubs and laminated papers are prohibited.
- Students and staff are advised to bring cloth bags
- All the stake holders are motivated to use stainless steel water bottles and lunch boxes.
- Plastic utensils in the stores, canteen and hostel kitchen are replaced with stainless steel plates, tumblers etc
- Plastic waste that comes in through lab equipment's package, empty chemical containers etc. are collected separately and disposed periodically for recycling

5.2.4 Used Battery Management

- Used batteries are disposed through Buy back method

5.2.5 e-Waste Management

- All electronic machineries are purchased under Buy-Back agreement for proper disposal of e waste to recycler

5.2.6 Other Solid Waste Management

- Egg cells are collected separately and used for calcium enrichment
- Solid wastes generated from damaged furniture are sent to waste wood collection centre. Useful furniture and other wooden materials are made from the waste
- Glass wastes are disposed periodically through municipal waste collection system.

6. Pollution abatement measures

6.1 Waste Reduction

- ❖ Green Chemistry is followed in the chemistry lab to reduce the hazardous waste generation
- ❖ Students are instructed not to waste paper while writing examinations.
- ❖ Reusing one side paper
- ❖ Where ever possible, printing on both sides of papers
- ❖ In order to reduce the use of paper the following initiative were taken by E - Governance
 - Attendance
 - Payment of fees
 - Submission of e-assignment through email
 - Digitalisation of Staff profiles and details about students
 - E – Circular through SMS, WhatsApp or Email
 - Online Admission Process – Printing of applications reduced & submission of applications through admission portal.
 - All inter department communications are through intranet
 - Online exams are conducted to reduce the paper usage.

6.2 Waste Recycling

- Recyclable papers are collected and kept and disposed as mixed waste to paper mills through authorized Vendors.
- The answer scripts after the publication of results are sent for recycling.
- e wastes are collected and sent to authorised recycler.

6.3 Waste Reuse

- Reuse one sided paper
- Reuse Envelopes

6.4 Waste to wealth

Kitchen waste are converted into bio fertilizer

Compost plot has been constructed to decompose kitchen waste by employing enriched microbial culture as well as vermicompost method

The vermicompost along with enriched microbial compost method is used to process the kitchen waste from the hostels



Compost plot for decomposing kitchen wastes



vermicompost facility.

The processed kitchen waste is effectively used to fertilize the organic farm in the recovery plot

Biogas plants installed- 25 M3 capacity X 2(Each one at Men & Women Hostel)

35 M3 capacity X 1(Men Hostel)

Men's Hostel- 2004	
Men's Hostel- 2010	
Women's Hostel- 2005	

The night soil produced by the hostels are directed to a total of three biogas plants from which fuel gas is produced. The gas is used in the mess kitchen at an average of 12 Kg methane per day.

- The egg shell waste are separately dried and powdered in grinder and used as an additive in compost produce. This mixture is used as manure for organic recovery plot, where vegetable are grown without chemical fertilizers.



6.5 Water Conservation initiatives

- Level controller are provided to reduce the wastage of water
- Industrial type RO Plant water rejects are used for garden
- Periodical preventive maintenance are carried out to avoid leakages



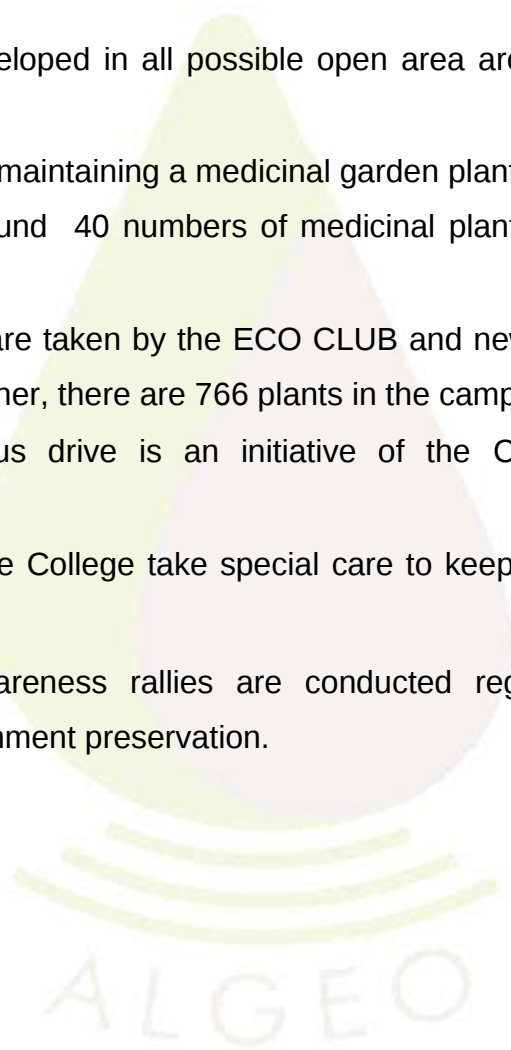
6.6 Energy conservation activities followed

- Auto Level controller is provided in all water storage tanks to avoid overflow of water and to save energy
- Replacing conventional electrical light fittings with energy efficient Light-Emitting Diode (LED) bulbs is going on as continuous process
- Maximum utilisation of day lights at the hostel and Colleges
- Staff and Students are made aware of using public transport and College buses and individual vehicle usage is being reduced
- Periodical maintenance and overhauling of generators is being carried out
- Periodical maintenance of UPS and Battery systems are carried out.
- The fans, lights, air-conditioners and other electronic and electrical equipments are switched off when not in use.
- Computers are switched to sleep mode or hibernate mode automatically when not in use.
- At the end of every practical session, Computer monitors are switched off.
- Soft copies are maintained instead of hard copies, to reduce power consumption and paper.
- Work supervisor and electrician regularly check the usage of lights, fans and all other energy sources during and out of the College hours.
- Lights and fans are switched off by the students whenever they are out of hostel rooms

7.Green Belt Development

Jamal Mohamed College, Trichy being located in the regime surrounded by agriculture based villages, naturally the institute is overwhelmed with the atmosphere of greenery. The Institution too does ever take meticulous efforts to maintain and retain the Nature given atmosphere with planting of new saplings The campus is lush green with gardens, lawns and plants wherever there is open space

- The eco-friendly ambience of the campus is a noteworthy feature of Jamal Mohamed College
- Green belt is developed in all possible open area are being converted into greenery
- The ECO CLUB is maintaining a medicinal garden plants which is spread over 300 sqft area. Around 40 numbers of medicinal plants are there inside the campus
- Special initiatives are taken by the ECO CLUB and new saplings are planted every year. Altogether, there are 766 plants in the campus.
- The Green campus drive is an initiative of the College to protect the environment.
- The Eco club of the College take special care to keep the campus neat and green.
- Environmental awareness rallies are conducted regularly to spread the message of environment preservation.



Green Belt Development



8.Rainwater Harvesting

Rainwater Harvesting

At Jamal Mohamed College, rainwater harvesting is done effectively to enhance the ground water level. The institution has rainwater harvesting pits at various locations and they are being maintained properly. The water drained during the rainy season is allowed to flow into the pits constructed in various places inside the campus including the Hostel Premises.

Rainwater recharge pit- 53 Numbers



Rainwater collection sumps-3 Numbers

Rain water Storing sump in Department of Chemistry:

This Rain water utilized by the **Chemistry Laboratory Since 2005.**

Capacity of the tank: 25.65KL

Size: 15x10

Since the rainwater is similar to distilled water which is utilized by students throughout the year

Rain water collection sump in front of chemistry department



9. AMBIENT AIR

9.1 Green House Gas Emission

Release of carbon dioxide into the atmosphere is contributes to the global warming and increasing the pace of climate change. More trees in the campus will make a source of sink for the carbon dioxide and for other greenhouse gases

Green House Gas -Emission during the year 2021-2022

• Green House Gas emission due to diesel	52.16 t CO ₂ e
• Green House Gas emission due to petrol	434.94 t CO ₂ e
• Green House Gas emission due to LPG	63.62 t CO ₂ e
• Green House Gas emission due to Grid power	905.68 t CO ₂ e
• Total GHG emission	1456.4 t CO ₂

9.2 Ambient Air Quality

Flue gas emission sources

- LPG combustion at hostel, canteen and labs
- Diesel generator at College and Hostel
- Incinerator at Women's Hostel

Fuel consumption per year

- LPG -20,995 Kgs
- Diesel for generator – 4,845 litres

Fuel consumption per day

- College workings days -180
- Hostel occupied with students -233 days
- Average LPG consumption per day- 90.1 kgs
- Average diesel consumption per day-26.9 litres

Combustion of LPG is NOT CONTINUOUS process

DIESEL Generator will run only when TNEB grid power fails

Considering the above situation, the quantity of flue gas emission and the impact on ambient air quality from the above combustions are negligible

Incinerators at the Women's Hostel

In the Hostel, incinerators have been kept in all the floors and all the incinerators are connected through exhaust duct.

Inside the College campus, 2 Nos Napkin Vending Machines and 4 Nos incinerators are available

The exhaust duct has been extended to the top of the building to disperse the smoke



Incinerators arrangements at women's hostel

9.3 Noise level

Noise level inside the campus

Sl. No	Location	Max value in dB	Average Value in dB
1	Near Main Entrance	87	56
2	BSc Maths Class room	72	59
3	Library	69	58
4	Vehicle Shed	67	57
5	College Ground	72	62
6	Office	69	62

- Diesel Generators (DG) sets do not run on a continuous basis. Only during power failure, DG sets are operated during the working hours of the College.
- Generally Power failure occurs for a very short time period.
- During planned shutdown hours, DGs run continuously based on the load
- Noise disturbance due to DG set is negligible.

10. Audit Findings & Recommendations

Noteworthy activities

- Clean, Green and plastic free campus
- Excellent Waste management system
- Milk for the hostel mess is brought through milk cans only. No pocket milks
- Biogas generation from Night soil and food waste
- Renewable energy utilisation both thermal and electrical
- Very good exhaust system arrangement at Women's Hostel's incinerator to disperse the smoke and vapours to improve Indoor Air Quality
- Excellent drinking water distribution system throughout the College and Hostels

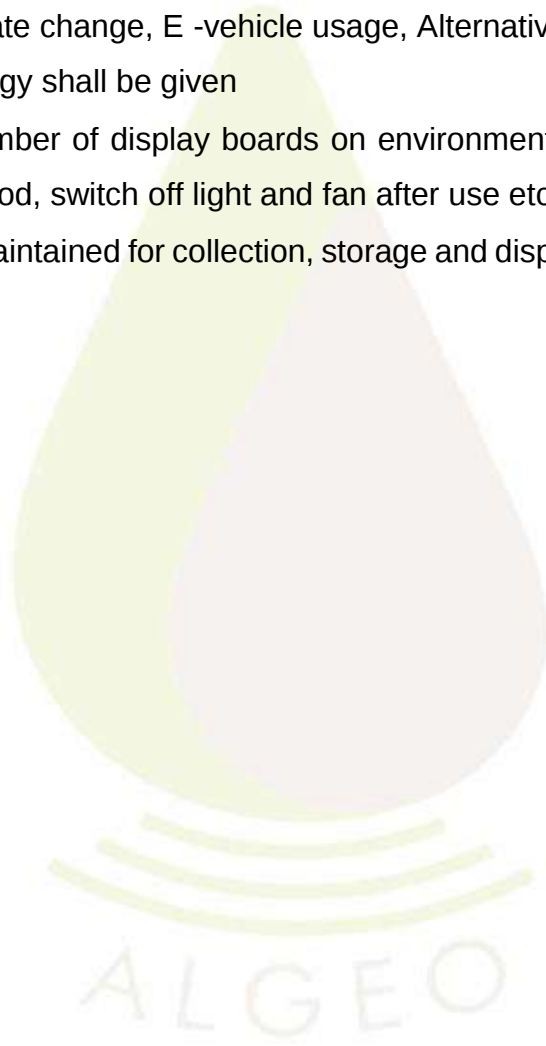
Findings

- Air pollution impact on Ambient Air quality is negligible since the quantity of fuel used for combustion in the institution is very less
- Noise levels inside the campus are within the prescribed limit.
- Very good initiative is taken by the institution to reduce paper consumption, collection of waste paper and disposal for recycling.
- Lot of initiatives are taken to conserve Water and Energy by the Institution.
- Flow meters are to be provided for better water management
- Total water consumption for Jamal Mohamed College and Hostel –238 KL/Day
- Electrical Energy consumption from TNEB GRID alone –11,04,486 units
- Diesel Generator electrical energy consumption- 4,845 units
- Solar Power electrical energy consumption-40,019 units
- Total Electrical Energy consumption is 11,19,021 units
- Total Green House Gas Emission is 1456.4 t CO₂e
- Green House gas reduction due to renewable energy utilisation and grown up trees is 16.1 t CO₂e

- Net Green House Gas emission is 1440.3 t CO₂ e

Recommendations

- More Electrical Energy reduction through Solar PV Power Plant Shall be planned
- Flow meter to be installed to know the exact usage of water.
- Flow meter for Bio gas generation shall be provided
- Training programs in Carbon footprint concepts, Awareness on Global warming & Climate change, E -vehicle usage, Alternative Fuel usage, Renewable Energy shall be given
- Increase the number of display boards on environmental awareness such as no wastage of food, switch off light and fan after use etc.
- Register to be maintained for collection, storage and disposal of E waste & used batteries



JAMAL MOHAMED COLLEGE (Autonomous)

COLLEGE WITH POTENTIAL FOR EXCELLENCE

Accredited (3rd Cycle) with 'A' Grade By NAAC

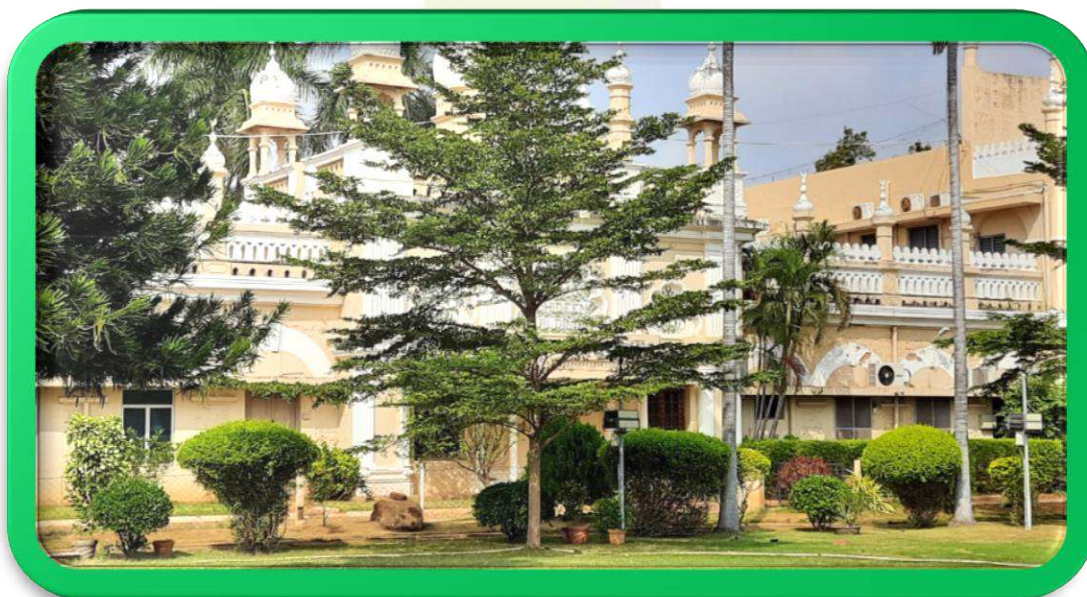
(Affiliated to Bharathidasan University)

TIRUCHIRAPPALLI – 620020

TAMILNADU, INDIA



GREEN AUDIT REPORT 2021-2022



AUDIT / REPORT BY



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ACKNOWLEDGEMENT

We at Alcheme Green Energy Company, Madurai are thankful to the Principal for giving us the opportunity to carry out Green audit at Jamal Mohamed College, Trichy -620 020. Alcheme Green Energy Company team is also thankful to all other supporting Officers / Staffs of the above institute for their wholehearted support, hospitality and the courtesy extended to the Audit team during the course of the visit.

The following officers from Alcheme Green Energy Company under the guidance of Mr. C. Jebaraj, B.Tech., have carried out the Green Audit.

Name	Qualifications	Certification Number
Mr. C. Jebaraj	B.Tech., PDGEM., DIS., BEE Certificated Energy Auditor, IRCA Certified Lead Auditor - OHSMS Internal Auditor-QMS CII Certified Carbon footprint Professional	EA-9847
Mr. S. Lakshmana Kumaran	B. Tech., MSc.,(Env. Science), MBA., IRCA Certified Lead Auditor ISO 14001 EMS	UID - 351851

The following staff from the Institution participated in the audit process

Name	Designation
Dr. D. I. George Amalarethinam	Associate Professor of Computer Science & Coordinator, IQAC
Dr. A. Jafar Ahamed	Associate Professor of Chemistry Core Member, IQAC
Dr. S. Nagoor Gani	Associate Professor of Tamil Coordinator, Khajamian Hostel
Dr. B. Sirajudeen	Assistant Professor of Tamil In-Charge, Campus Maintenance
Mr. M. Shaik Mohideen	Electrician – (Training Instructor- Sp. Gr.)



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I. Summary of the Green Audit

Green audit of Jamal Mohamed College and its Hostel was carried by Alcheme Green Energy Company. The green audit reports assist in the process of attaining an eco-friendly approach to the sustainable development of the college. Green audit report is a very powerful and valuable communications tool to use when working with various stakeholders who need to be convinced that things are running smoothly and systems and procedures are coping with natural changes and modifications that occur.

A few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques. This will lead to a prosperous future in context of Green Campus leading to sustainable environment and community development. It has been proved frequently that the practical suggestions, alternatives and observations that have resulted from audits have added positive value to the audited organisation. It is hoped that the results presented in the Green Audit Report will serve as a guide for educating Jamal Mohamed College, on the existing environment related practices and resource usage and spawn new activities and innovative practices.

Noteworthy activities

- Clean , Green and plastic free campus
- Renewable energy utilisation through Solar Power Plant and Solar water Heater
- Rainwater harvest system to recharge the ground level at various locations
- Excellent waste to wealth management system through Biogas plant using Nightsoil and food waste

The audit outputs and recommendations are summarised as follows:

- Total water consumption for Jamal Mohamed College and Hostel –238 KL/Day
- Electrical Energy consumption from TNEB GRID alone –11,04,486 units
- Diesel Generator electrical energy consumption -14,535 units
- Solar Power electrical energy consumption-40019 units
- Total Electrical Energy consumption is 11,59,040 units
- Total Green House Gas Emission is 1456.4 t CO₂e
- Green House gas reduction due to grown up trees is 16.1 t CO₂e

- Net Green House Gas emission is 1440.3 t CO₂e

We are happy to submit this detailed green audit report to the Jamal Mohamed College



For Alcheme Green Energy Company
Madurai



1.1 Green Policy

Jamal Mohamed College has formulated a Green Policy to guide all its green initiatives. Cleanliness in the campus is maintained through proper disposal of wastes, utilization of eco-friendly supplies and effective recycling program. The concept of eco-friendly culture is disseminated among the students through various seminars/workshops and community-oriented programs. Institution strictly follows reduce, reuse and recycle method to limit energy usages

The main objectives are as follows:

- To ensure that energy and water are used responsibly and conserved
- To develop and maintain environmental management programs to minimize adverse environmental impacts.
- Effective waste management and convert waste to wealth

The Institution vouchsafes:

- Its commitment to sustainability and environmental management
- It reiterates the stand that managing environmental issues is a high priority for the College
- Its commitment to prevent pollution and to continuously improve upon environmental protection.
- A commitment to keeping students and staffs safe from any environmental hazards.

1.2 Total Campus Area & Building Spread Area

- Campus area -**60 Acres**
- Build up area – **2,24,398 Sq. ft.**

1.3 NAAC Grading

- Accredited with 'A' Grade by NAAC

1.4 Campus Infrastructure

Jamal Mohamed College is located in calm and quiet surroundings that are conducive to learning. It helps to stimulate both personal and professional growth of the students. The campus is located about 3 Kms from Trichy Central Bus Stand and Railway Junction.

CLASS ROOMS

Spacious, well ventilated and well-equipped classrooms with projectors and screens facilitate and reinforce effective teaching-learning experience for the faculty and students.

LABORATORIES

Jamal Mohamed College has set up highly advanced science and computer laboratories attached to different departments. These are adequately equipped with the latest gadgets, instruments and apparatus with the aim of providing students conceptual as well as practical understanding of the subject through hands-on training.

LIBRARY

The college has a modern general library with a robust collection of over 216953 volumes of books in 134921 titles on many disciplines covering all major fields of Science, Humanities, and Management. Besides the general library, each department has its own library, containing a major portion of the collection of books. The Library subscribes to about 236 periodicals which include national & international journals, and magazines subscribed by various departments. Many English, Tamil and Malayalam daily newspapers are also subscribed for the enlightenment of both staff and students.

The working methodology of Library such as acquisition of books, circulation control, cataloguing and serials control have been automated using an integrated software. Open access system is implemented in the library.

A modern digital library network with a high speed internet access is also housed in the premises. Reprographic facilities with printer & CD writer are made available for the beneficiaries. Separate sections for Reference Material, Book Bank, Periodicals, and Project Reports are provided for easy access.

DRINKING WATER

Water is not just an ordinary need to the human beings. It plays a vital role in our life hence the institution gives more care towards the provision of safe water to everyone. The college has installed R.O. units in all the possible locations which supply pure and safe drinking water.

INTERNET

College is fully equipped with round the clock internet facility

TRANSPORT

The College provides transport facility for the women students at nominal rates. About 15 college buses help the students to commute to the college from various places in the Tiruchirappalli City.

COMMUNICATION LAB

Communication Training Centre offers the communication classes that offer the flexibility to study. Highly innovative and unique mix of engaging Communication course is accomplished by assessments and interactive sessions that allow the students to progress consistently. Communication training centre provides a Good approach that follows best practices for learning and practicing English Communication.

Adopt a distinct method beyond the classroom, implement an integrated training strategy, sessions are structured to be interactive and participative in a fun and dynamic environment.

Allow students to practice additionally, interactive and regular feedback sessions from trainer, for the advantage to acquire skills faster.

HOSTEL

In the hostel accommodation is provided with quality food from Modular kitchen, RO purified drinking water, 24 x7 availability of water, Recreation provisions and other amenities. Accommodation is available for undergraduate and postgraduate students. The hostels provide a calm and relaxing atmosphere to accelerate the creative talents of the students. The teachers who act as resident wardens of the hostels provide moral and emotional support and guidance to the inmates. The hostel securities ensure 24 hours safety.

The KHAJAMIAN HOSTEL (FOR MEN)

The Khajamian Hostel is one of the biggest hostels in Tamilnadu. The hostel has 9 blocks and can accommodate about 2200 students

The Khajamian Hostel gives an opportunity to the students of downtrodden families, a chance to Earn while Learn with free boarding and Lodging facilities and also monthly honorarium is given.

The Premier Rooms are available for the inmates to occupy AC or Non AC rooms and students can opt for Premier Mess / Normal Mess.

A separate wing called Mosque Hostel (Rent Free) is available for the economically poor and meritorious wards of Imam and Muadinar.

Sports Hostel cares for both body and mind of the Sports persons separately with nourishing food items to equip their sporting skills.

THE WOMEN HOSTEL

The College is running an exclusive hostel for women students which is situated inside the college premises with all infrastructure facilities

The amenities like Visitors' Room, Library, Reading Room, Clinic, Cafeteria, Ironing Room, Television Room, Prayer Hall, Auditorium, Multipurpose Hall, Guest House, Internet Browsing Centre, Play Ground, Canteen, Generators and Public Address System are available in the hostel premises, to facilitate the inmates and stake holders

2. Pre-Audit Stage

A pre-audit meeting provided an opportunity to reinforce the scope and objectives of the audit and discussions were held on the practicalities associated with the audit. This meeting is an important prerequisite for the green audit because it is the first opportunity to meet the auditee and deal with any concerns.

The meeting was an opportunity to gather information that the audit team can study before arriving on the site. The audit protocol and audit plan was handed over at this meeting and discussed in advance the audit itself.

In Jamal Mohamed College pre-audit meeting was conducted successfully and necessary documents were collected directly from the College before the initiation of the audit processes. Actual planning of audit processes was discussed in the pre-audit meeting. Audit team was also selected in this meeting with the help of staff and the college management.

The audit protocol and audit plan were handed over at this meeting and discussed in advance of the audit itself. The audit team worked together, under the leadership of the lead auditor, to ensure completion within the brief and scope of the audit.

2.1 Management's Commitment

The Management of the college has shown the commitment towards the green auditing during the pre-audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environment friendly and planting more trees on the campus etc., after the green auditing.

2.2 Scope and Goals of Green Auditing

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues.

Green Audit is the most efficient and ecological way to manage environmental problems. It is a kind of professional care which is the responsibility of each individual who are the part of economic, financial, social, environmental factor. It is necessary to conduct green audit in the College campus because students become aware of the green audit, its advantages to save the planet and they become good citizens of our country.

A very simple indigenized system has been devised to monitor the environmental performance of Jamal Mohamed College, Trichy. It comes with a series of questions to be answered. This innovative scheme is user friendly. The aim of this is to help the Institution to set environmental examples for the community and to educate the young learners.

2.3 Benefits of the Green Auditing

- More efficient resource management
- To create a green campus
- To enable waste management through reduction of waste generation, solid-waste and water recycling
- To create plastic free campus and evolve health consciousness among the stakeholders
- Recognize the cost saving methods through waste minimizing and management
- Point out the prevailing and forthcoming complications
- Authenticate conformity with the implemented laws
- Empower the organizations to frame a better environmental performance
- Enhance the alertness for environmental guidelines and duties
- Impart environmental education through systematic environmental management approach and Improving environmental standards
- Benchmarking for environmental protection initiatives
- Financial savings through a reduction in resource use
- Development of ownership, personal and social responsibility for the College and its environment
- Developing an environmental ethic and value systems in youngsters.
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the college.

2.4 Target Areas of Green Auditing

Green audit forms part of a resource management process. Although they are individual events, the real value of green audits is the fact that they are carried out, at defined intervals and their results can illustrate the improvement.

Eco-campus concept mainly focuses on the efficient use of energy and water; minimize waste generation or pollution and also economic efficiency. All these indicators are assessed in process of “Green Auditing of educational institute”. Eco-campus focuses on the reduction of contribution to emissions, procure a cost effective and secure supply of energy, encourage and enhance energy use conservation, reduce the institute’s energy and water consumption, reduce wastes to landfill and integrate environmental considerations into all contracts and services considered to have significant environmental impacts. Target areas included in this green auditing are water, energy, waste, green campus and carbon footprint.

Auditing for Water Management

Water is a natural resource; all living matters depend on water. While freely available in many natural environments, in human settlements potable (drinkable) water is less readily available. We need to use water wisely to ensure that drinkable water is available for all, now and in future. Aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible Institution should examine its water use practices.

Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water. It is therefore essential that any environmentally responsible Institution examine its water use practices.

Auditing for Energy Management

Energy cannot be seen, but we know it is there because we can see its effects in the forms of heat, light and power. This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment. An old incandescent bulb uses approximately 60 W while an energy efficient light emitting diode (LED) uses only less than 10 W. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation. It is therefore essential that any environmentally responsible institution examine its energy use practices.

Auditing for Waste Management

Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities which can cause health problems. This indicator addresses waste production and disposal of plastic waste, paper waste, food waste, and recycling.

Solid waste can be divided into two categories: general waste and hazardous waste. General wastes include what is usually thrown away in homes and schools such as garbage, paper, tins and glass bottles. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals and used oils.

Unscientific landfills may contain harmful contaminants that leach into soil and water supplies, and produce greenhouse gases contributing to global climate change. Furthermore, solid waste often includes wasted material resources that could otherwise be channelled into better service through recycling, repair, and reuse. Thus the minimization of solid waste is essential to a sustainable college. It is therefore essential that any environmentally responsible institution examine its waste processing practices.

Auditing for Green Campus Management

Unfortunately, biodiversity is facing serious threats from habitat loss, pollution, over consumption and invasive species. Species are disappearing at an alarming rate and each loss affects nature's balance and our quality of life. Without this variability in the living world, ecological systems and functions would break down, with detrimental consequences for all forms of life, including human beings.

Newly planted and existing trees decrease the amount of carbon dioxide in the atmosphere. Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. The amount of oxygen that a single tree produces is enough to provide one day's supply of oxygen for people. So while the students are busy studying and working on earning those good grades, all the trees on campus are also working hard to make the air cleaner.

Trees on our campus impact our mental health as well; studies have shown that trees greatly reduce stress, which the students feel.

Auditing for Carbon Footprint

Commutation of stakeholders has an impact on the environment through the emission of greenhouse gases into the atmosphere consequent to burning of fossil fuels (such as petrol). The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising around 415 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions.

An important aspect of doing an audit is to be able to measure your impact so that we can determine better ways to manage the impact. In addition to the water, waste, energy and biodiversity audits we can also determine what our carbon footprint is, based on the amount of carbon emissions created. One aspect is to consider the distance and method travelled between home and college every day. It undertakes the measure of bulk of carbon dioxide equivalents exhaled by the organization through which the carbon accounting is done. It is necessary to know how much the organization is contributing towards sustainable development. It is therefore essential that any environmentally responsible institution examine its carbon footprint.

3. Audit Stage

In Jamal Mohamed College green auditing was done with the help of Alcheme Green Energy Company involving different student groups, teaching and non-teaching staff. The green audit began with the teams walking through all the different facilities at the college, determining the different types of appliances and utilities as well as measuring the usage per item and identifying the relevant consumption patterns and their impacts.

The staff and learners were interviewed to get details of usage, frequency or general characteristics of certain appliances. Data collection was done in the sectors such as Energy, Waste, Greening, Carbon footprint and Water use. College records and documents were verified to clarify the data received through survey and discussions.

3.1 Student Clubs and Forums Involved

- ECO Club, National Service Scheme(NSS)

3.2 Comments on Site Tour

Site inspection was done along with students and staff. Questionnaires were answered during the site tour. Students and staff took much interest in the data collection processes. It was quite interesting and fascinating. It was an environmental awareness program for the students who participated in the green auditing. The experience of green auditing was totally a new experience for most of the students. They have shared their expectations about a green campus and gave suggestions for the audit recommendations.

3.3 Review of Documents and Records

Documents such as electricity and water charge remittance, laboratory equipment registers, audited statements and office registers were examined and data were collected. College calendars, college magazines, annual report of the college and NAAC self-assessment reports, UGC report etc. were also verified as a part of data collection.

3.4 Review of Policies

Discussions were made with the College management regarding their policies on environmental management. Future plans of the college were also discussed. The management would formulate an environment /green policy for the college in the light of green auditing. The purpose of the green audit was to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the Institution.

3.5 Interviews

In order to collect information for green auditing different audit groups interviewed teaching and non-teaching staff, students and other stakeholders of the college.

3.6 Site inspection

College and its premises were visited and analysed by the audit-teams several times to gather information. Campus trees were counted and identified. Medicinal /Herbal plants garden, play grounds, canteen, library, office rooms and parking grounds were also visited to collect data. Number and type of vehicles used by the stakeholders were counted. Number of LPG cylinders used in labs, canteen and hostel kitchen were also counted.



4. Post Audit Stage

The base of any green audit is that its findings are supported by documents and verifiable information. The audit process seeks, on a sampled basis, to track past actions, activities, events, and procedures to ensure that they are carried out according to systems requirements and in the correct manner.

Green audits form a part of a process. Although they are individual events, the real value of green audits is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time. Although green audits are carried out using policies, procedures, documented systems and objectives as a test, there is always an element of subjectivity in an audit.

The essence of any green audit is to find out how well the environmental organisation, environmental management and environmental equipment are performing. Each of the three components is crucial in ensuring that the organisation's environmental performance meets the goals set in its green policy. The individual functioning and the success of integration will all play a role in the degree of success or failure of the organisation's environmental performance.

4.1 Key Findings, Observations and Evaluations

a) Water Usage at Jamal Mohamed College

Total number of students studied during the academic year 2021-2022: 12,225

Teaching & non-Teaching staff in the institution during the academic year 2021-2022: 774

Total number of stake holders: 12,999

Water for college and hostel

Corporation water through Tanker Lorry for college - 6,000 litres/day

Corporation water through Tanker Lorry for Men's Hostel - 60,000 litres/day

Corporation water through Tanker Lorry for Women's Hostel - 60,000 litres/day

Borewell water for Hostel and college – 1,12,000 litres/day

Total water usage -2,38,000 litres/day

Main water uses in the College campus are Drinking, Rest room, Canteen and Lab

Water usage in the College- 90 KL / Day

Water usage per day per stakeholder in the college – 6.92 litres

Water usage at College

Sl. No	Place	Water usage Quantity Litres / Day
1	Drinking	13,000
2	Rest room	48,000
3	Canteen	12,000
4	Lab	8,000
5	Garden	8,000
6	Construction	1,000
	Total	90,000

Waste water generation in the college – 68 KL/day

Water usage at Hostels

Number of students and staff residing in the hostel in the year 2021-2022: 2106

Main water uses in the Hostel are Drinking, Washing of clothes, Cooking & Vessel cleaning and for Rest room

Water usage at Hostels (Men and Women) - 148 KL / Day

Water consumption per day per stakeholder in the hostel – 70.27 litres

Water usage at Hostel(Men and Women)

Sl. No	Place	Water usage Quantity Litres / Day
1	Drinking	4000
2	Cooking	4000
3	Rest room	42,000
4	Bathing	38,000
5	Clothes washing	48,000
6	Vessel Cleaning	12,000
	Total	148,000

Waste water generation in the Hostels – 140 KL /day

For drinking water: RO water system of both industrial and commercial type were installed in college and hostels.



In addition to industrial RO plants, small size domestic models of RO units are installed in all the floors of all Blocks to cater the needs of drinking water inside the college campus

- Analysis of Drinking water and bore well water samples are done periodically
- The quality of Drinking water is within the norms.
- Microbial test for Drinking water is carried out on periodical manner.



Rainwater Harvesting

At Jamal Mohamed College, rainwater harvesting is done effectively to enhance the ground water level. The institution has rainwater harvesting pits at various locations and they are being maintained properly. The water drained during the rainy season is allowed to flow into the pits constructed in various places inside the campus including the Hostel Premises.

Rainwater recharge pit- 53 Numbers





RAINWATER HARVEST PITS

Rainwater collection sumps-3 Numbers

Rain water Storing sump in Department of Chemistry:

This Rain water utilized by the **Chemistry Laboratory Since 2005.**

Capacity of the tank: 25.65KL

Size: 15x10

Since the rainwater is similar to distilled water which is utilized by students throughout the year

Rain water collection sump in front of chemistry department



Water Conservation initiatives

- Level controller are provided to reduce the wastage of water
- Industrial type RO Plant water rejects are used for garden
- Periodical preventive maintenance are carried out to avoid leakages

Water Level Controllers



b)Energy

Total Conventional Electrical Energy Consumption details

	Electrical Energy Consumption - TNEB and DG	
	TNEB-College	units
1	HT service	1,89,941
2	LT service	3,57,068
	TNEB-Hostel	
1	Men's Hostel	3,96,981
2	Women's Hostel	1,60,496
	DG Set	
1	Both College and Hostel	14,535
	Total	11,59,040

Renewable Electrical Energy-Solar Electrical energy Consumption

Installed capacity -50KW

Energy Generation from installation-1,69,468 units

Energy Generation during the year 2021-2022-40,019 units only



Conventional Thermal Energy consumption -Liquified Petroleum Gas (LPG)

- LPG cylinders used- commercial cylinders of 19 kgs capacity
- Total LPG consumption during the year 2021-2022- 20,995 Kgs

Conventional Thermal Energy consumption- Diesel

Diesel Consumption for transport during the year 2021-2022 – 14,690 Litres

Renewable Thermal Energy-Solar Water Heater

Solar Water Heater installed-1000 LPD- one

500 LPD- Four

Total Capacity-3,000 LPD



Renewable Thermal Energy- Biogas

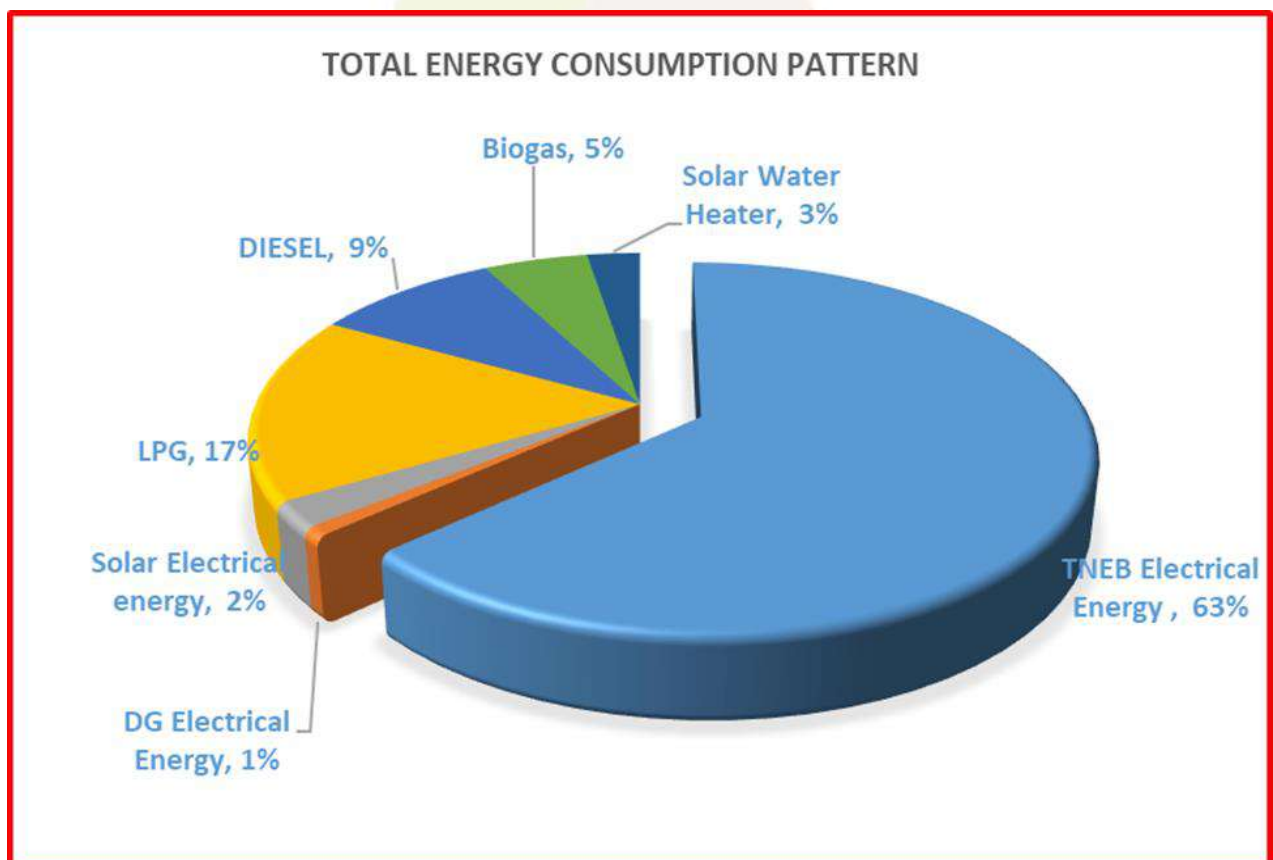
Biogas plants installed- 25 M3 capacity X 2(Each one at Men & Women Hostel)
35 M3 capacity X 1(Men Hostel)



15.Total Energy consumption

Electrical (Conventional & Renewable) and Thermal (Conventional & Renewable)

SL.NO	TYPE OF ENERGY	ENERGY -GCAL		Percentage
1	TNEB Electrical Energy	949.86	0.633572123	63.36
2	DG Electrical Energy	12.50	0.008337789	0.83
3	Solar Electrical energy	34.42	0.02295631	2.30
3	LPG	249.84	0.166648049	16.66
4	DIESEL	137.40	0.091645284	9.16
5	Biogas	76.50	0.051026858	5.10
6	Solar Water Heater	38.70	0.025813587	2.58
	Total	1499.2		100.00



The energy conservation measures followed

- Auto Level controller is provided in all water storage tanks to avoid overflow of water and to save energy
- Replacing conventional electrical light fittings with energy efficient Light-Emitting Diode (LED) bulbs is going on as continuous process
- Maximum utilisation of day lights at the hostel and colleges
- Staff and Students are made aware of using public transport and college buses and individual vehicle usage is being reduced
- Periodical maintenance and overhauling of generators is being carried out
- Periodical maintenance of UPS and Battery systems are carried out.
- The fans, lights, air-conditioners and other electronic and electrical equipments are switched off when not in use.
- Computers are switched to sleep mode or hibernate mode automatically when not in use.
- At the end of every practical session, Computer monitors are switched off.
- Soft copies are maintained instead of hard copies, to reduce power consumption and paper.
- Work supervisor and electrician regularly check the usage of lights, fans and all other energy sources during and out of the college hours.
- Lights and fans are switched off by the students whenever they are out of hostel rooms

c) WASTE

Quantity of waste generated:-

- Waste water generation in the College - 68 KL /day
- Waste water generation in the Hostel – 140 KL /day

College

- Biodegradable—<5 kg/day

Office

- Non-biodegradable —< 0.5kg/day

College Canteen

- Biodegradable —< 15 kg / day
- Non-biodegradable —<0.5kg / day
- Aluminium foil —<0.1kg / day

Hostel

- Biodegradable(Food waste) - 100-300 kg / day
- Non-biodegradable – <0.5kg / day

Open area

- Biodegradable (Dry leaves)- 10-20 kg / day

Plastic waste

- Less than 1000 grams / day

e-Waste

- Less than 200 kgs / year

Waste Management

Liquid waste Management

- The night soil produced by the hostels are directed to a total of three biogas plants from which fuel gas(Biogas) is produced. The gas is used in the mess kitchen at an average of 12 Kg methane per day on normal college working days
- College has a large mechanical filtering system to process grey water
The grey water produced is used to irrigate the coconut farm situated behind the hostel. The grey water produced is first processed is mechanically filtered and pumped out to the coconut farm. Due to long term use, the nitrate content in grey water is increasing due to usage of detergents. For this purpose, the

mechanically filtered grey water discharge is passed through a stagnation filter assisted by live herbaceous plants that are capable of absorbing and accumulating nitrogenous wastes. For this purpose, four stagnation filter units have been constructed

- RO plant reject from industrial type is used for gardening purpose.

Bio-degradable waste management

- ❖ Bio-Degradable and non-biodegradable waste are collected in separate bins provided. ,
- ❖ Compost pit has been constructed to decompose kitchen waste by employing enriched microbial culture as well as vermicompost method
- ❖ Dry leaves are collected separately, dumped in the pits and converted into Bio fertilizer and used as bio fertiliser
- ❖ The egg shell waste are separately dried and powdered in grinder and used as an additive in compost produce. This mixture is used as manure for organic recovery plot, where vegetable are grown without chemical fertilizers.

Plastic Waste Management

- The college has been declared as a 'Plastic Free' zone.
- Milk for the hostel mess is brought through milk cans only. No pocket milks
- Use of polythene bags, plastic cubs and laminated papers are prohibited
- Students and staff are advised to bring cloth bags
- All the stake holders are motivated to use stainless steel water bottles and lunch boxes.
- Plastic utensils in the stores, canteen and hostel kitchen are replaced with stainless steel plates, tumblers etc
- Plastic waste that comes in through lab equipment's package, empty chemical containers etc. are collected separately and disposed periodically for recycling.

Used Battery Management

- Used batteries are disposed through Buy back method

e-Waste Management

- All electronic machineries are purchased under Buy-Back agreement for proper disposal of e waste to recycler

Other Solid Waste Management

- Egg cells are collected separately and used for calcium enrichment
- Solid wastes generated from damaged furniture are sent to waste wood collection centre. Useful furniture and other wooden materials are made from the waste
- Glass wastes are disposed periodically through municipal waste collection system.

Waste Reduction

- ❖ Students are instructed not to waste paper while writing examinations.
- ❖ Reusing one side paper
- ❖ Where ever possible, printing on both sides of papers
- ❖ In order to reduce the use of paper the following initiative were taken by E - Governance
 - Attendance
 - Payment of fees
 - Submission of e-assignment through email
 - Digitalisation of Staff profiles and details about students
 - E – Circular through SMS, WhatsApp or Email
- Online Admission Process – Printing of applications reduced & submission of applications through admission portal.
- All inter department communications are through intranet
- Online exams are conducted to reduce the paper usage.

Waste Recycling

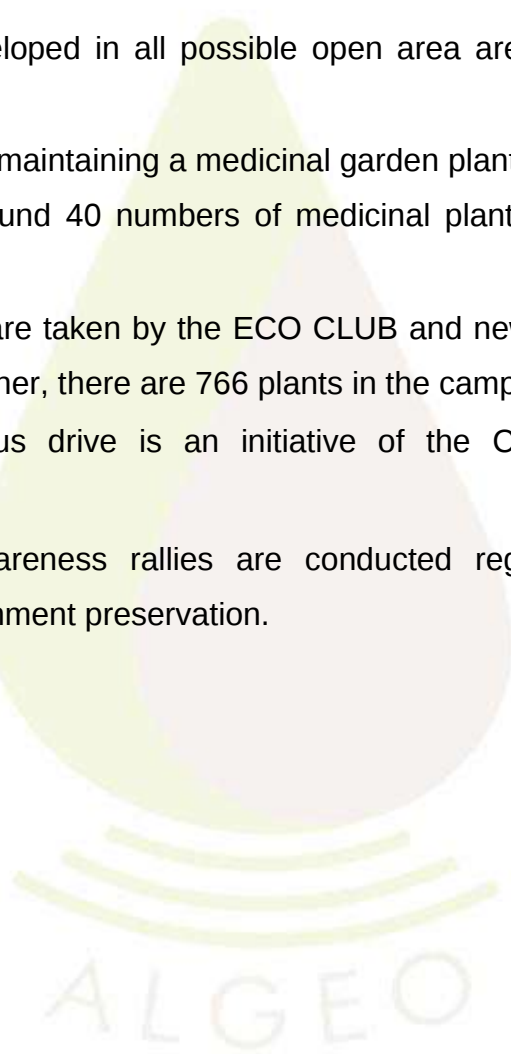
Recyclable papers are collected and kept and disposed as mixed waste to paper mills through authorized Vendors.

- The answer scripts after the publication of results are sent for recycling.
- e wastes are collected and sent to authorised recycler.

d) Green Campus

Jamal Mohamed College, Trichy being located in the regime surrounded by agriculture based villages, naturally the institute is overwhelmed with the atmosphere of greenery. The Institution too does ever take meticulous efforts to maintain and retain the Nature given atmosphere with planting of new saplings The campus is lush green with gardens, lawns and plants wherever there is open space

- The eco-friendly ambience of the campus is a noteworthy feature of Jamal Mohamed College
- Green belt is developed in all possible open area are being converted into greenery
- The ECO CLUB is maintaining a medicinal garden plants which is spread over 300 sqft area. Around 40 numbers of medicinal plants are there inside the campus
- Special initiatives are taken by the ECO CLUB and new saplings are planted every year. Altogether, there are 766 plants in the campus.
- The Green campus drive is an initiative of the College to protect the environment.
- Environmental awareness rallies are conducted regularly to spread the message of environment preservation.



Hostel Campus Tree Details (2021-22)

Sl No	Tree Name in Tamil	Tree Name in English	Quantity
1	வேப்ப மரம்	Neem Tree	121
2	தென்னை மரம்	Coconut Tree	280
3	புளிய மரம்	Tamarind Tree	3
4	பாதாம் மரம்	Almond Tree	12
5	பாக்கு மரம்	Beetlenut Tree	6
6	தேக்கு மரம்	Teakwood Tree	18
7	வாகை மரம்	Substitute Tree	13
8	சிகப்பு அரளி மரம்	Red	7
9	நெல்லிக்காய் மரம்	Gooseberry Tree	2
10	மாமரம்	Mango Tree	18
11	எலுமிச்சை மரம்	Lemon Tree	2
12	அரச மரம்	Peepul Tree	1
13	பப்பாளி மரம்	Papaya Tree	1
14	நெட்டிலின் மரம்	Ashoka Tree	28
15	புங்க மரம்	Punga maram	6
16	முந்திரி மரம்	Cashew Tree	4
17	காக்கரட்டான் மரம்	Cactus Tree	1

Sl No	Tree Name in Tamil	Tree Name in English	Quantity
18	ஆவி மரம்	Spirit Tree	1
19	கொடுக்காப்பள்ளி மரம்		1
20	வாதமோடக்கி மரம்		3
21	மூங்கில் மரம்	Bamboo Tree	1
22	கொய்யா மரம்	Guava Tree	7
23	முருங்கை மரம்	Drumstick Tree	10 67
24	இளவம்பஞ்சு மரம்	Cotton Tree	1
25	நொனா மரம்	Nuna Tree	17
26	எழந்த மரம்	Locust Tree	1

27) No of Trees in PANH - 94

GREEN BELT DEVELOPMENT



e) Carbon Footprint

Release of carbon dioxide into the atmosphere is contributes to the global warming and increasing the pace of climate change. More trees outside the campus will make a source of sink for the carbon dioxide and for other greenhouse gases.

• No of students and staff stayed in the hostel	2106
• Diesel consumption by college buses	14,690 L
• Diesel consumption by DG in the hostel & college	4845 L
• Total Diesel Consumption	19,535 L
• Radius of Trichy city	14 KM
• Average distance travelled by staff and students per day	28 Km
• No of Four wheelers being used by students and staff	61
• No of Two wheelers being used by students and staff	2011
• Average Fuel efficiency of four wheelers –	20 Km/ L
• Average Fuel efficiency of Two Wheelers -	60 Km/ L
• Average Petrol consumption by four wheelers-	15,372 L
• Average Petrol consumption by two wheelers-	1,68,924 L
• Total Petrol consumption-	1,84,296 L
• Total LPG consumption(Hostel & canteen) per year -	20,995 Kgs
• Total electrical power consumed from Grid-	11,04,486 units

Green House Gas -Emission

• Green House Gas emission due to diesel	52.16 t CO ₂ e
• Green House Gas emission due to petrol	434.94 t CO ₂ e
• Green House Gas emission due to LPG	63.62 t CO ₂ e
• Green House Gas emission due to Grid power	905.68 t CO ₂ e
• Total GHG emission	1456.4 t CO ₂

Green House avoided

• Total Solar power generation -	40,019 units
• Total capacity of solar water heater installed -	3,000 LPD
• Biogas generation	15,300 M ³
• Green House Gas avoided due to solar power plant	31.61 t CO ₂ e
• Green House Gas avoided due to solar water heater	35.55 t CO ₂ e
• Green House Gas avoided due to biogas	26.75 t CO ₂ e
• Total GHG emission avoided	93.91 t CO ₂

Green House Gas-Reduction

• No of fully grown up tress	766
• Green House Gas offset by tress	16.1 t CO ₂ e

Net Green House Gas emission- (1456.4.- 16.1) 1440.3 t CO₂ e

4.2 Consolidation of Audit Findings

We hope that students would have developed a greater appreciation and understanding of the impact of their actions on the environment. They have successfully been able to determine the impacts on the environment through the various auditing exercises. Participating in this green auditing procedure they have gained knowledge about the need of sustainability of the college campus. It will create awareness on the use of the Earth's resources in their home, college, local community and beyond.

General

- Green Policy is stated and objectives are reflected very well in the functioning of the College and Hostel
- Gardens inside the college premises are found to be well maintained.
- Campus is declared plastic free and lot of initiatives and innovative actions are taken to maintain the green policy.

Water

- Total water consumption -238 KL/day
- Excellent Water Management & Waste Water Management .

Water Conservation

- Level controllers are provided to all water storage tanks to avoid overflow
- Periodical Maintenance of water taps are carried out to avoid leakages

Rain water Harvest system

- Appreciable work has been carried out for harvesting the rainwater both from college buildings & hostel for charging the ground water level and usage.

Energy

- Total electrical energy consumption from TNEB Grid alone is 11,04,486 units
- Lot of Energy saving activities are implemented
- More number of conventional tube lights are replaced with LED lights
- 50KW Solar plant installation is highly appreciable.
- 3,000 LPD Solar water heater to supply hot water to students are good
- Biogas is generated from Nightsoil and food waste and used it at Kitchen

Waste to Wealth

- From night soil and Food waste biogas is generated and used in the kitchen
- 1 X 35 and 2 X 25 M³ Biogas plant is functioning well

Waste Recycle

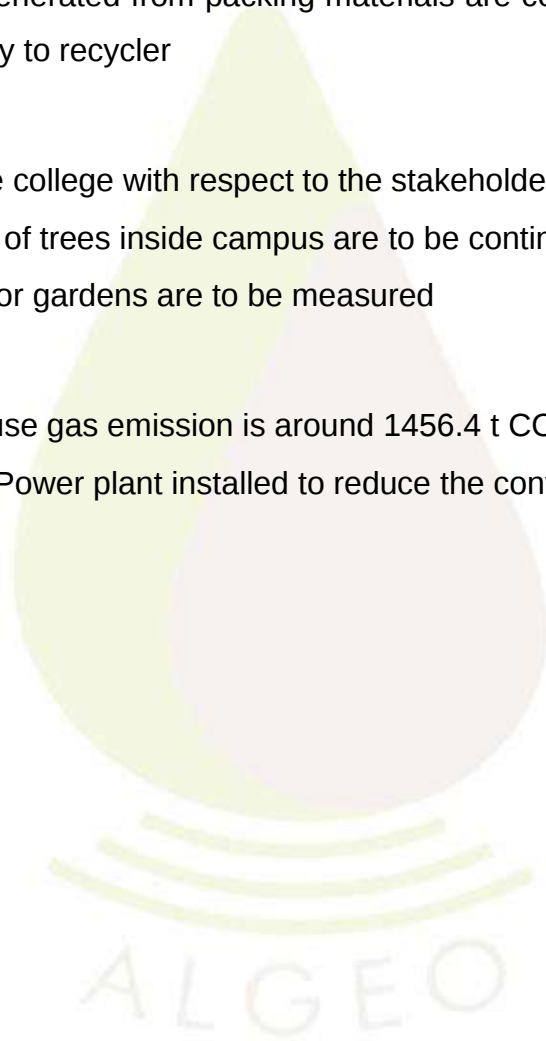
- Paper wastes are collected in a proper manner and sent for recycling
- E - wastes are collected and kept separately to send to authorised recycler
- Plastic wastes generated from packing materials are collected separately and disposed properly to recycler

Green Campus

- Tree cover of the college with respect to the stakeholder strength is excellent
- Regular planting of trees inside campus are to be continued
- Usage of water for gardens are to be measured

Carbon Foot Print

- Yearly Greenhouse gas emission is around 1456.4 t CO₂e
- 50KW Solar PV Power plant installed to reduce the conventional EB power



4.3 Preparation of Action Plan

Policies referring to college's management and approach towards the use of resources need to be considered. The college green policy/environmental policy for its sustainable development to be monitored consciously.

4.4 Follow-up Action and Plans

Green Audits are exercises which generate considerable quantities of valuable management information. The time, effort and cost involved in this exercise is often considerable and in order to be able to justify this expenditure, it is important to ensure that the findings and recommendations of the audit are considered at the correct level within the organisation and that action plans and implementation programs result from the findings. Audit follow up is part of the wider process of continuous improvement.

4.5 Environmental Education

The following environmental education program may be implemented in the college before the next green auditing:-

- Training programs in Water & Waste management , Solids and e-Waste Management, Carbon footprint concepts, Awareness on Global warming
- Increase the number of display boards on environmental awareness such as no wastage of food/water, switch off light and fan after use, plastic free campus etc.

Awareness on Carbon Emission

- Students and Staff members are made totally aware of pollution caused by use of vehicles.
- The awareness programs on carbon emission at individual as well as social level will help to avoid air and noise pollution due to vehicles.

4.6 Recommendations

Common Recommendations

- Targets for Green policy shall be fixed

Criteria Wise Recommendations

Water

- Water consumption monitoring system has to be implemented in the college campus and hostel
- Water Flow meter to be introduced to measure the quantity of water used
- More awareness programs on water conservation to be conducted.
- More display on water conservation shall be displayed

Energy

- Target for more percentage of Renewable Energy contribution
- Remaining old Tube lights shall be replaced with LED tube lights.
- Conventional fans shall be replaced with BLDC fan
- Conduct more awareness programs on importance of energy saving for students and staff
- More display on energy conservation shall be displayed
- Five star rated energy efficient ACs to be procured in the future

Waste

- Conduct exhibition of recyclable waste products
- Every six months, e-waste to be disposed as per e-waste Management rules 2016.
- Register to be maintained for collection, storage and disposal of e-waste & used batteries
- Biodiesel project shall be given to students from used cooking oil

Green Campus

- Keep continuously encouraging students for making the campus green
- Roof garden for hostel building shall be planned in future
- Maintenance of Green house building to be improved
- Training/awareness on Global warming, Climate Change shall be given to students

Carbon footprint

- Fix a target to reduce Green House Gas emission
- Present Net Green House gas emission per year is 1440.3 t CO₂ e
- Aim for Net Zero emission from the institution in the coming years
- Green building approach for one building shall be planned in the future
- Training / awareness on Carbon foot print concepts to be given to students and staffs



JAMAL MOHAMED COLLEGE (*Autonomous*)

COLLEGE WITH POTENTIAL FOR EXCELLENCE
Reaccredited (3rd Cycle) with 'A' Grade By NAAC
(Affiliated to Bharathidasan University)

TIRUCHIRAPPALLI – 620020
TAMILNADU, INDIA



ENERGY AUDIT REPORT 2020-2021



AUDIT / REPORT BY



ALCHEME GREEN ENERGY COMPANY

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ACKNOWLEDGEMENT

We at ALCHEME GREEN ENERGY COMPANY, Madurai are thankful to the Principal for giving us the opportunity to carry out Energy audit of Jamal Mohamed College , Trichy -620 020, Tamilnadu, India. Alcheme Green Energy Company team is also thankful to all other supporting Officers / Staffs of the above institute for their wholehearted support, hospitality and the courtesy extended to the Audit team during the course of the visit.

The following officers from Alcheme Green Energy Company under the guidance of Mr. C. Jebaraj, B.Tech., have carried out the Energy Audit.

Name	Qualifications	Certification Number
Mr. C. Jebaraj	B.Tech., PDGEM., DIS., BEE Certificated Energy Auditor, IRCA Certified Lead Auditor - OHSMS Internal Auditor-QMS	EA-9847
Mr. S. Lakshmana Kumaran	B. Tech., MSc.,(Env. Science), MBA. Lead Auditor-Environment	-

The following staff from the Institution participated in the audit process

Name	Designation
Dr. T. Abdul Razak	Coordinator, IQAC
Dr. A. Jafar Ahamed	Associate Professor of Chemistry Core Member, IQAC
Dr.M. Syed Ali Padusha	Associate Professor of Chemistry Coordinator, Khajamian Hostel
Dr. B. Sirajudeen	Associate Professor of Tamil In-Charge, Campus Maintenance
Mr. M. Shaik Mohideen	Electrician – (Training Instructor- Sp. Gr.)

Summary of Audit

Energy audit of Jamal Mohamed College and Hostel was carried by Alcheme Green Energy Company. The Audit team has gone through the data related to TNEB GRID Electrical Energy, Renewable Energy , Diesel and LPG consumption. A study was also carried out on Renewable energy utilisation and Energy Conservation measures to reduce energy consumption.

During the visit it was observed that Jamal Mohamed College strictly follows reduce, reuse and recycle policy to limit energy usage. The concept of energy conservation is disseminated among the students and staffs through various seminars/workshops and training programs.

We hope that the results presented in the energy auditing report will serve as a guide for the institution on the existing energy related practices and resource usage.

Noteworthy

- **Solar Power Plant installed at Women's Hostel-50KW**
- **Solar Water Heater installed at Hostel -3000 LPD**
- **Biogas plant installed at hostel- 25 cubic meter- 3 Numbers**
- **Auto power cut off introduced in many water pumping system to SAVE WATER and ENERGY**
- **Tracking arrangement for UPS and Battery AMC**

The audit outputs and recommendations are summarised as follows

Due to corona, more number of on line classes were conducted and the energy consumption during the year 2020-2021 is very less compare to previous years

- Electrical Energy consumption from TNEB during the year 2020-2021 –5,69,555 units.
- Electrical Energy consumption from Diesel Generator – 3261 units.
- Solar Power Electrical energy consumption(Women's Hostel)- 8,750 units
- Total Electrical Energy consumption from EB,DG and Solar – 5,81,566 units.
- LPG consumption -6,194 Kgs
- Diesel Consumption for transport -1,162 Litres
- Biogas generation- 1,051 Kgs
- Lot of Energy conservation initiatives are taken.

- Due to Corona, Solar Power plant was not operated to its full capacity. In future, solar power plant to be utilised to the maximum possible way to consume more renewable energy
- Solar power plant shall be planned in future for HT service.
- More Renewable energy utilisation shall be planned in the coming years.

ENERGY SAVING POTENTIALS

1. Conventional tube lights shall be replaced with LED tube lights

Replacement cost for 100 LED tube lights-Rs 200x100= RS 20,000
Payback period-5.5 months
Cost savings for 100 LED tube lights-Rs 44,000 / year
Energy savings for 100 LED tube lights-5,500 units/ year

2. Conventional fans shall be replaced with energy efficient fans

Replacement cost for 100 Nos. ENERGY EFFICIENT FAN-Rs 2,800x100= RS 2,80,000
Cost savings for 100 Nos. ENERGY EFFICIENT FAN -Rs 1,65,600 / year
Energy savings for 100 Nos. ENERGY EFFICIENT FAN -20,700 units/ year
Payback period 20 months

- Remaining Conventional Tube lights shall be replaced with LED tube lights in a phased manner
- 5 Star rated Energy efficient electrical equipments shall be procured in future
- Power Factor of HT service to be monitored on daily basis and to be maintained above 0.9 value

We are happy to submit this detailed energy audit report to the Jamal Mohamed College



Alcheme Green Energy Company
Madurai

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1. College TNEB HT Service connection Tariff, Connected Load and Energy consumption details for the year 2020-2021

TNEB HT SERVICE CONNECTION DETAILS	
Service Number	06 909 442 0210
Tariff	HT II B
Maximum Demand Permitted	250 KVA

Service no 06909440210														Total
Tariff HT IIB,		Permitted MD-250 KVA					Demand charges Rs 350/KVA							
	Rate Rs/ units	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	
Industrial consumption	6.35	4677	4089	4746	5325	6206	5259	7234	10254	13281	16516	26637	7755	111979
Peak Hr consumption	1.27	0	0	0	0	0	0	0	0	0	0	0	0	0
Night hr consumption	0.3175	0	0	0	0	0	0	0	0	0	0	0	0	0
Quarters consumption	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commercial consumption	8.05	506	231	306	550	445	405	320	329	379	582	560	0	4613
Temp supply consumption	12	909	728	540	768	675	930	1016	564	742	856	910	0	8638
Total units		6092	5048	5592	6643	7326	6594	8570	11147	14402	17954	28107	7755	125230
Total amount in Rs		140130	88557	200789	149980	146477	152905	172270	176831	189445	209248	276192	137312	2040136
overall unit cost in Rs		23.00	17.54	35.91	22.58	19.99	23.19	20.10	15.86	13.15	11.65	9.83	17.71	

HT Service Energy Consumption details for the year 2020-2021

HT Tariff II B- Consumption	111979	units
HT Commercial Consumption	4613	units
HT Temp Supply	8638	units
Total	125230	units

2.College TNEB LT Service connection Tariff, Connected Load and Energy consumption details for the year 2020-2021

TNEB LT SERVICE CONNECTION DETAILS				
Sl.No	SERVICE NO	Department	Tariff	connected load in KW
1	06 222 207 544	Computer	LM2B2/ LTCT	94.99
2	06 222 207 1131	MBA	LM2B2/ LTCT	82
3	06 222 207 509	Tamil	LM 2B1/ LT	48
4	06 222 207 13	General Library COE Office	LM 2B1/ LT	36
5	06 222 207 14	Maths	LM 2B1/ LT	48
6	06 222 207 15	Main Gate	LM 2B1/ LT	5.99
7	06 222 207 16	Principial Office	LM 2B1/ LT	40.08
8	06 222 207 17	Main Building	LM 2B1/ LT	48
	Total			403.06

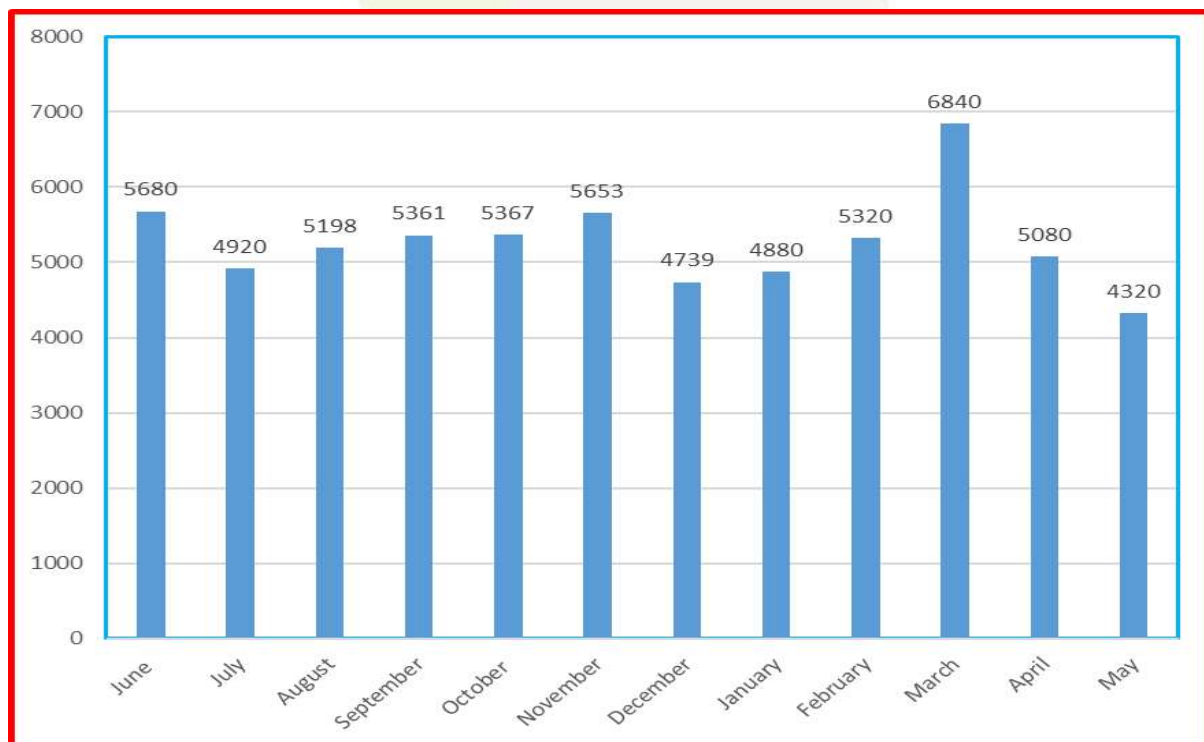
TNEB ENERGY CONSUMPTION					
Sl. No	SERVICE NO	Tariff	Units Consumed	Bill Amount - Rs	Average Unit cost-Rs
1	06 222 207 544	LM2B2/ LTCT	63358	568337	8.97
2	06 222 207 1131	LM2B2/ LTCT	23560	245309	10.41
3	06 222 207 509	LM 2B1/ LT	16890	137151	8.12
4	06 222 207 13	LM 2B1/ LT	19340	143251	7.41
5	06 222 207 14	LM 2B1/ LT	24840	185055	7.45
6	06 222 207 15	LM 2B1/ LT	4070	29096	7.15
7	06 222 207 16	LM 2B1/ LT	34230	237048	6.93
8	06 222 207 17	LM 2B1/ LT	51210	344574	6.73
	Total		237498	1889821	

3.Total TNEB Electrical Energy Consumption in the college

	HT Service	units
1	HT II B	111979
2	HT Commercial	4613
3	HT Temp	8638
	LT SERVICE	
1	LM 2B2- 2 Nos	86918
2	LM 2B1- 6 Nos	150580
	Total	362728

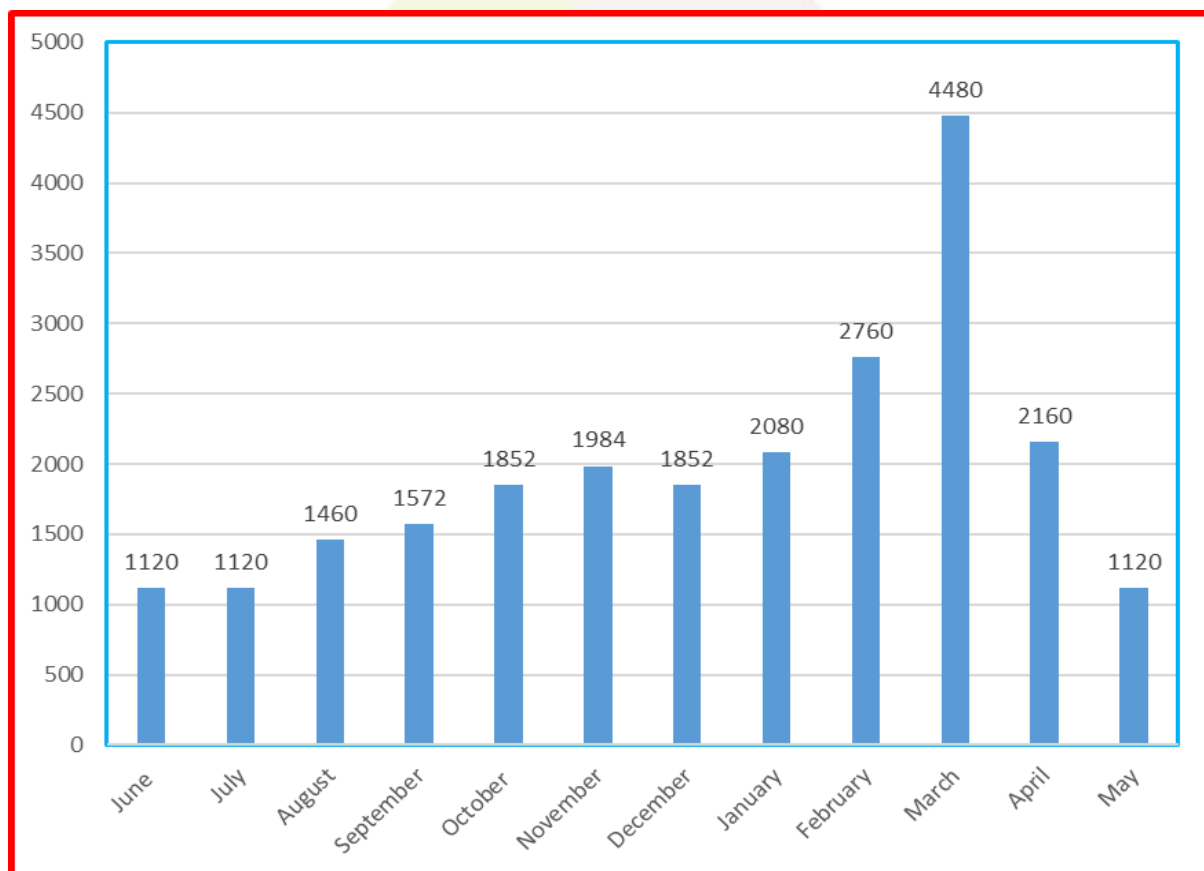
4.College TNEB LT service number wise energy consumption

1.Service No 06 222 207 544 94.99 KW 3 Phase Tariff LM2B2					
Sl. No.	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	29.06.2020	June	5680	50502	8.89
2	30.07.2020	July	4920	44517	9.05
3	31.08.2020	August	5198	46718	8.99
4	29.09.2020	September	5361	47979	8.95
5	31.10.2020	October	5367	48039	8.95
6	30.11.2020	November	5653	50303	8.90
7	31.12.2020	December	4739	43084	9.09
8	30.01.2021	January	4880	44211	9.06
9	27.02.2021	February	5320	47688	8.96
10	31.03.2021	March	6840	59721	8.73
11	30.04.2021	April	5080	45795	9.01
12	31.05.2021	May	4320	39780	9.21
	Total		63358	568337	8.97

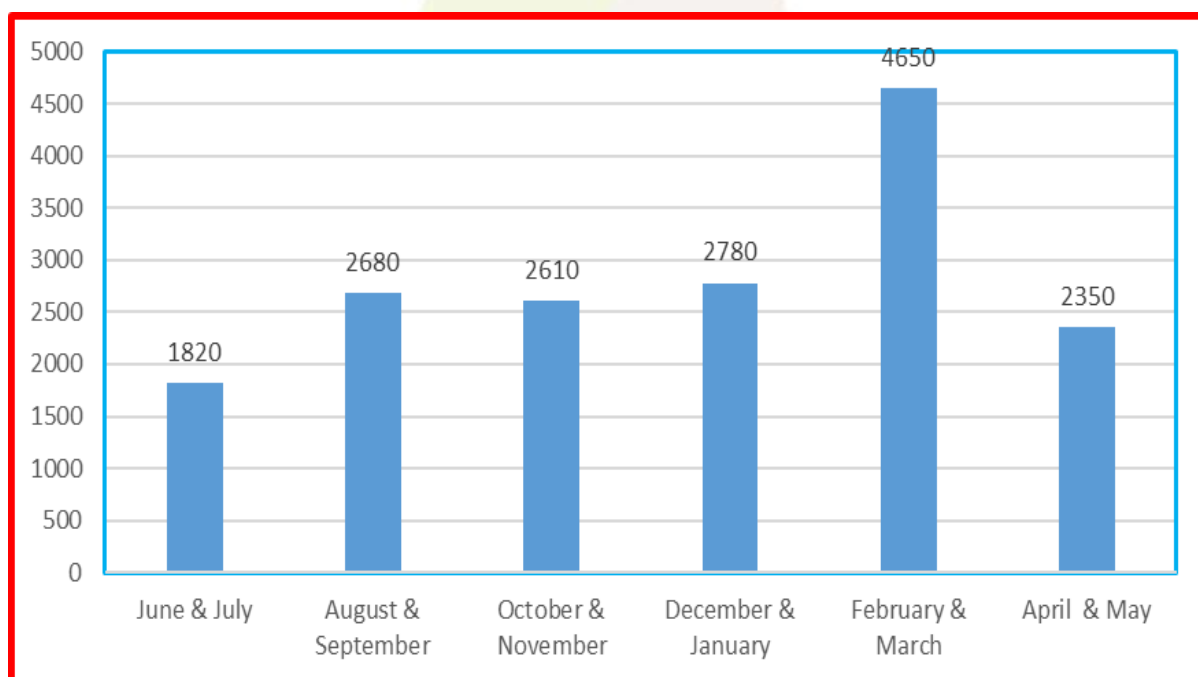


Month wise Energy Consumption

2.Service No 06 222 207 1131 82 KW 3 Phase Tariff LM2B2					
Sl. No.	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	29.06.2020	June	1120	13782	12.31
2	30.07.2020	July	1120	13782	12.31
3	31.08.2020	August	1460	16469	11.28
4	30.09.2020	September	1572	17342	11.03
5	31.10.2020	October	1852	19547	10.55
6	30.11.2020	November	1984	20592	10.38
7	31.12.2020	December	1852	19562	10.56
8	30.01.2021	January	2080	21360	10.27
9	27.02.2021	February	2760	26757	9.69
10	31.03.2021	March	4480	40317	9.00
11	30.04.2021	April	2160	22023	10.20
12	31.05.2021	May	1120	13776	12.30
	Total		23560	245309	10.41

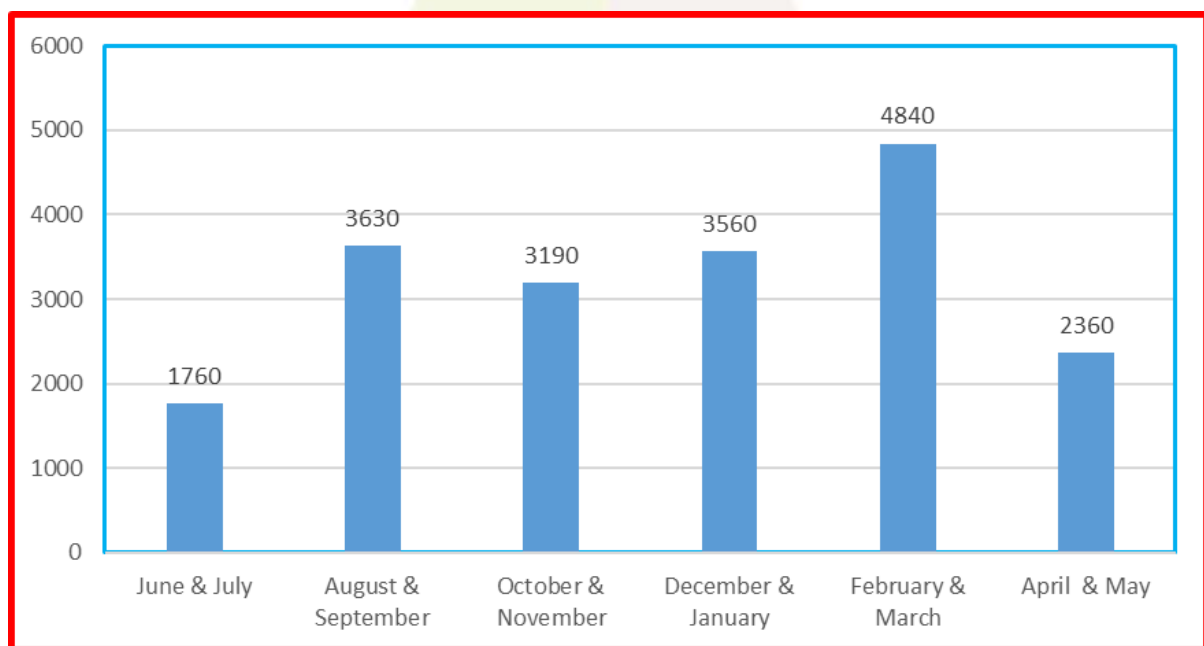


3.Service No 06 222 207 509 48 KW 3 Phase Tariff LM 2B1					
Sl.No	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	24.08.2020	June & July	1820	16802	9.23
2	27.10.2020	August & September	2680	22037	8.22
3	22.12.2020	October & November	2610	21632	8.29
4	24.02.2021	December & January	2780	22646	8.15
5	23.04.2021	February & March	4650	34014	7.31
6	22.06.2021	April & May	2350	20020	8.52
	Total		16890	137151	8.12



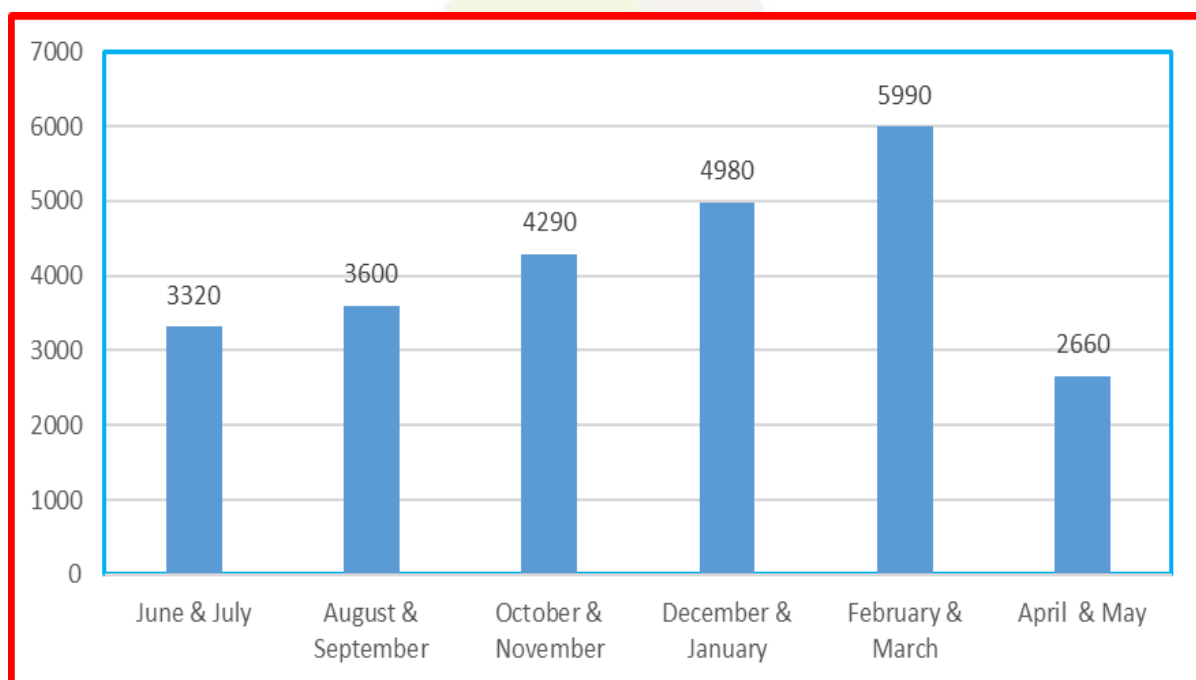
Bi Monthly Energy Consumption

4.Service No 06 222 207 13 36 KW 3 Phase Tariff LM 2B1					
Sl.No	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	24.08.2020	June & July	1760	15024	8.54
2	27.10.2020	August & September	3630	26356	7.26
3	22.12.2020	October & November	3190	23652	7.41
4	24.02.2021	December & January	3560	25910	7.28
5	23.04.2021	February & March	4840	33668	6.96
6	22.06.2021	April & May	2360	18641	7.90
	Total		19340	143251	7.41



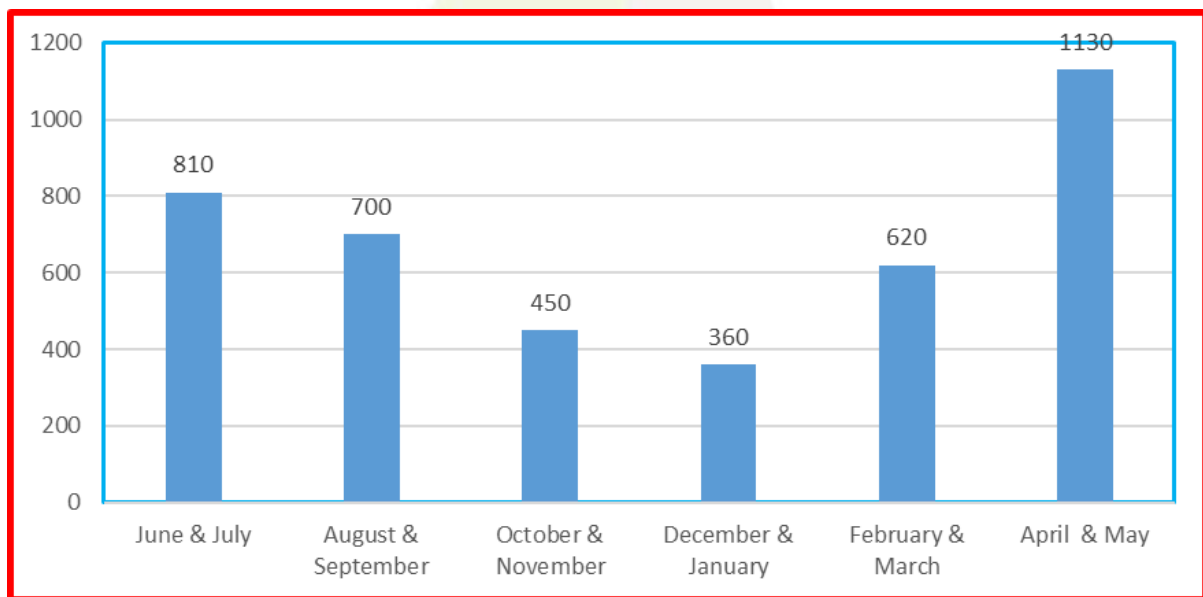
Bi Monthly Energy Consumption

5.Service No 06 222 207 14 48 KW 3 Phase Tariff LM 2B1					
Sl.No	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	24.08.2020	June & July	3320	25877	7.79
2	27.10.2020	August & September	3600	27573	7.66
3	22.12.2020	October & November	4290	31733	7.40
4	24.02.2021	December & January	4980	35929	7.21
5	23.04.2021	February & March	5990	42069	7.02
6	22.06.2021	April & May	2660	21874	8.22
	Total		24840	185055	7.45



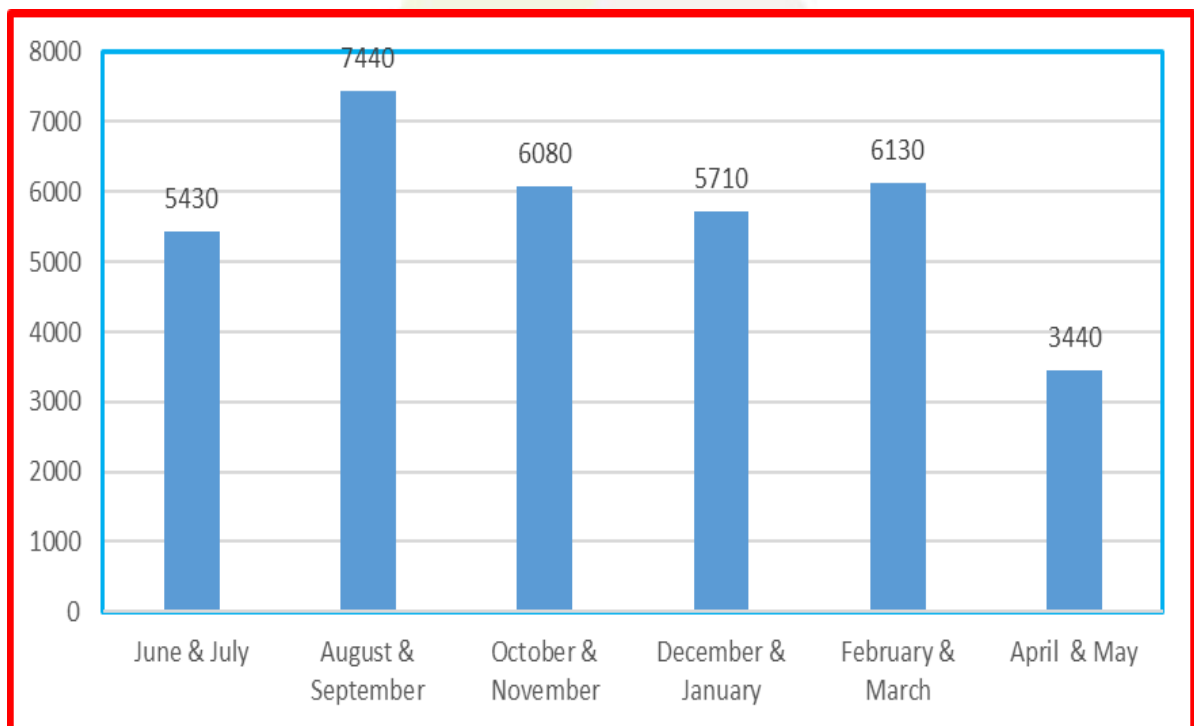
Bi Monthly Energy Consumption

6.Service No 06 222 207 15 5.99 KW 3 Phase Tariff LM 2B1					
Sl.No	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	24.08.2020	June & July	810	5706	7.04
2	27.10.2020	August & September	700	4970	7.10
3	22.12.2020	October & November	450	3455	7.68
4	24.02.2021	December & January	360	2912	8.09
5	23.04.2021	February & March	620	4487	7.24
6	22.06.2021	April & May	1130	7566	6.70
	Total		4070	29096	7.15



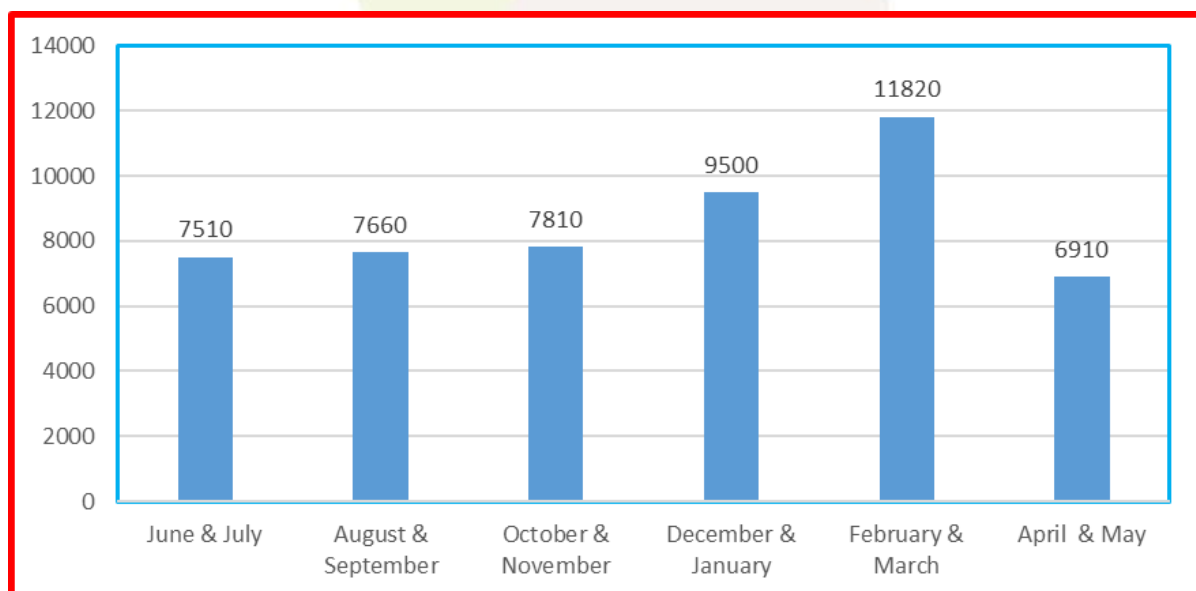
Bi Monthly Energy Consumption

7.Service No 06 222 207 16 40.08 KW 3 Phase Tariff LM 2B1					
Sl.No	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	24.08.2020	June & July	5430	37866	6.97
2	27.10.2020	August & September	7440	49989	6.72
3	22.12.2020	October & November	6080	41760	6.87
4	24.02.2021	December & January	5710	39508	6.92
5	23.04.2021	February & March	6130	42098	6.87
6	22.06.2021	April & May	3440	25827	7.51
	Total		34230	237048	6.93



Bi Monthly Energy Consumption

8.Service No 06 222 207 17 48 KW 3 Phase Tariff LM 2B1					
Sl.No	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	24.08.2020	June & July	7510	51186	6.82
2	27.10.2020	August & September	7660	52157	6.81
3	22.12.2020	October & November	7810	53057	6.79
4	24.02.2021	December & January	9500	63278	6.66
5	23.04.2021	February & March	11820	77339	6.54
6	22.06.2021	April & May	6910	47557	6.88
	Total		51210	344574	6.73



Bi Monthly Energy Consumption

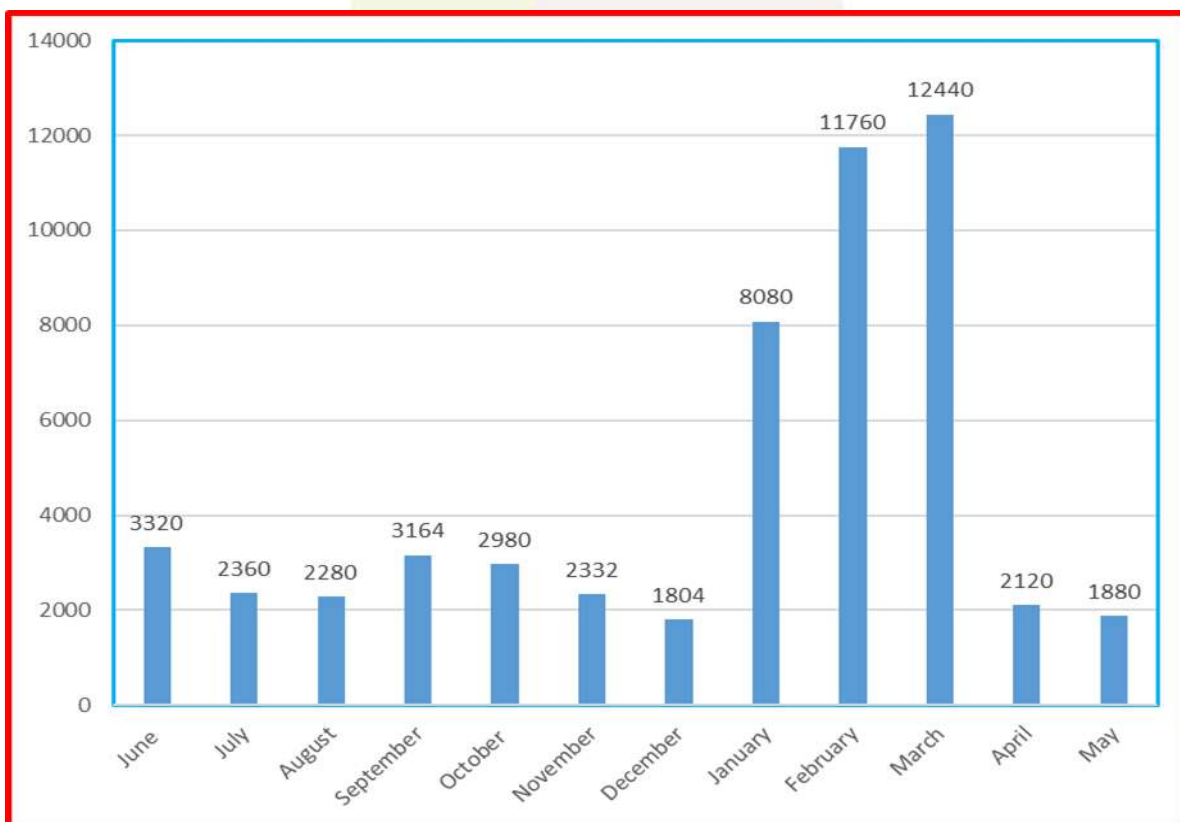
5. TNEB Electrical yearly energy consumption in the Men's hostel with respect to each service number

Sl.No	Service number	Tariff	Building	Energy consumption in units (KWH)	Load in KW
1	06 222 207 26	LM2B2	Quadrangle west	16280	15
2	06 222 207 27	LM2B2	Grinder Room	1960	13.73
3	06 222 207 28	LM2B2	Mess No-5	1670	4
4	06 222 207 29	LM2B2	Mess No-2	1570	3
5	06 222 207 30	LM61	Mess No-5	410	1.75
6	06 222 207 31	LM2B2	Mess No-3	2130	3
7	06 222 207 32	LM2B2	Mess No-5	2330	1.75
8	06 222 207 33	LM2B2	Office	17000	21
9	06 222 207 34	LM2B2	Quadrangle old building	13340	17
10	06 222 207 35	LM2B2	MBA, Drinking water	2620	27
11	06 222 207 36	LM2B2	Mess No-1	1770	5.6
12	06 222 207 37	LM2B2	Burunei Block	11390	12
13	06 222 207 38	LM2B2	Garden Bore well	6610	8
14	06 222 207 39	LM2B2	Drainage Motor	610	4.52
15	06 222 207 350	LM51	Tank Pump	3940	10
16	06 222 207 1046	LM2B2	Sulaiha Hostel	5430	12
17	06 222 207 1101	LM2B2	MH, Chennai alumni block	8870	17
18	06 222 207 1289	LM2B2	IDB & MI Block	35680	34
19	06 222 207 1519	LM61	Temporary service	110	10
20	06 222 207 1874	LM2B2	Auditorium AC (monthly)	9277	50
21	06 222 207 1875	LM 51	ATM Room (paid bank)	9310	4
	Total			152307	274.35

Service wise yearly energy consumption

6. TNEB Electrical Energy consumption in the Women's hostel

Service No 06 222 207 1045 85.5 KW 3 Phase Tariff LM2B2					
Sl. No.	Assessment Date	Months	Units Consumed	Bill Amount -Rs	Unit cost-Rs
1	29.06.2020	June	3320	31401	9.46
2	30.07.2020	July	2360	23778	10.08
3	31.08.2020	August	2280	23151	10.15
4	30.09.2020	September	3164	30122	9.52
5	31.10.2020	October	2980	28682	9.62
6	30.11.2020	November	2332	23558	10.10
7	31.12.2020	December	1804	19397	10.75
8	30.01.2021	January	8080	68907	8.53
9	27.02.2021	February	11760	97887	8.32
10	31.03.2021	March	12440	103239	8.30
11	30.04.2021	April	2120	21885	10.32
12	31.05.2021	May	1880	19998	10.64
	Total		54520	492005	9.02



Month wise Energy Consumption

7. DG set Electrical Energy consumption

Electrical Energy Consumption from DG sets-3261 units

DG sets in Aided Section

SI No	Block	Power Capacity
1	Main Gate	30 KVA
2	MBA	125 KVA
3	Controller of exam	63 KVA
4	Zoology, ARABIC	63 KVA
5	Maths, Economis	63 KVA
6	Principal Office, Aided office	63 KVA
7	Physics, Chemistry	63 KVA
8	Commerce, English	63 KVA
9	Computer science	125 KVA

DG sets in Self Finance Section

SI No	Block	Power Capacity
1	Information Technology	125 KVA
2	Fashion Technology	63 KVA
3	English, Maths, Tamil	63 KVA
4	Microbiology, Biotech	63 KVA
5	BBA, Physics	63 KVA
6	Auditorium, Commerce, Hotel Management	125 KVA

DG sets in women's Hostel

SI No	Block	Power Capacity
1	Dubai Block, Dubai Alumini Block	120 KVA
2	UGC Block , New mess	83 KVA

DG sets in Men's Hostel

Sl No	Block	Power Capacity
1	Mess 5	63 KVA
2	Mess 5	62.5 KVA
3	Motor room Near	62.5 KVA
4	Burunei Block Near	62.5 KVA
5	Sports Hostel	62.5 KVA



8.Total Conventional Electrical Energy Consumption details

	Electrical Energy Consumption - TNEB and DG	
	TNEB-College	units
1	HT service	125230
2	LT service	237498
	TNEB-Hostel	
1	Men's Hostel	152307
2	Women's Hostel	54520
	DG Set	
1	Both College and Hostel	3261
	Total	572816

9. Renewable Electrical Energy-Solar Electrical energy Consumption

Installed capacity -50KW

Energy Generation from installation-1,29,449 units

Energy Generation during the year 2020-2021-8750 units only

(Less utilisation due to more online classes because of Corona)



10.Total Electrical Energy Consumption -Renewable and conventional

	Total Electrical Energy Consumption - Renewable and conventional	
	TNEB-College	units
1	HT service	125230
2	LT service	237498
	TNEB-Hostel	
1	Men's Hostel	152307
2	Women's Hostel	54520
	DG Set	
1	Both College and Hostel	3261
	Solar	
	Hostel	8750
	Total	581566

11. Conventional Thermal Energy consumption - LPG

- LPG cylinders used- commercial cylinders of 19 kgs capacity
- Total LPG consumption during the year 2020-2021- 6194 Kgs

12. Conventional Thermal Energy consumption- Diesel

Diesel Consumption for transport during the year 2020-2021 – 1162 Litres



13.Renewable Thermal Energy-Solar Water Heater

Solar Water Heater installed-1000 LPD- one

500 LPD- Four

Total Capacity-3000 LPD



14. Renewable Thermal Energy- Biogas

Biogas plants installed- 25 M3 capacity X 2(Each one at Men & Women Hostel)

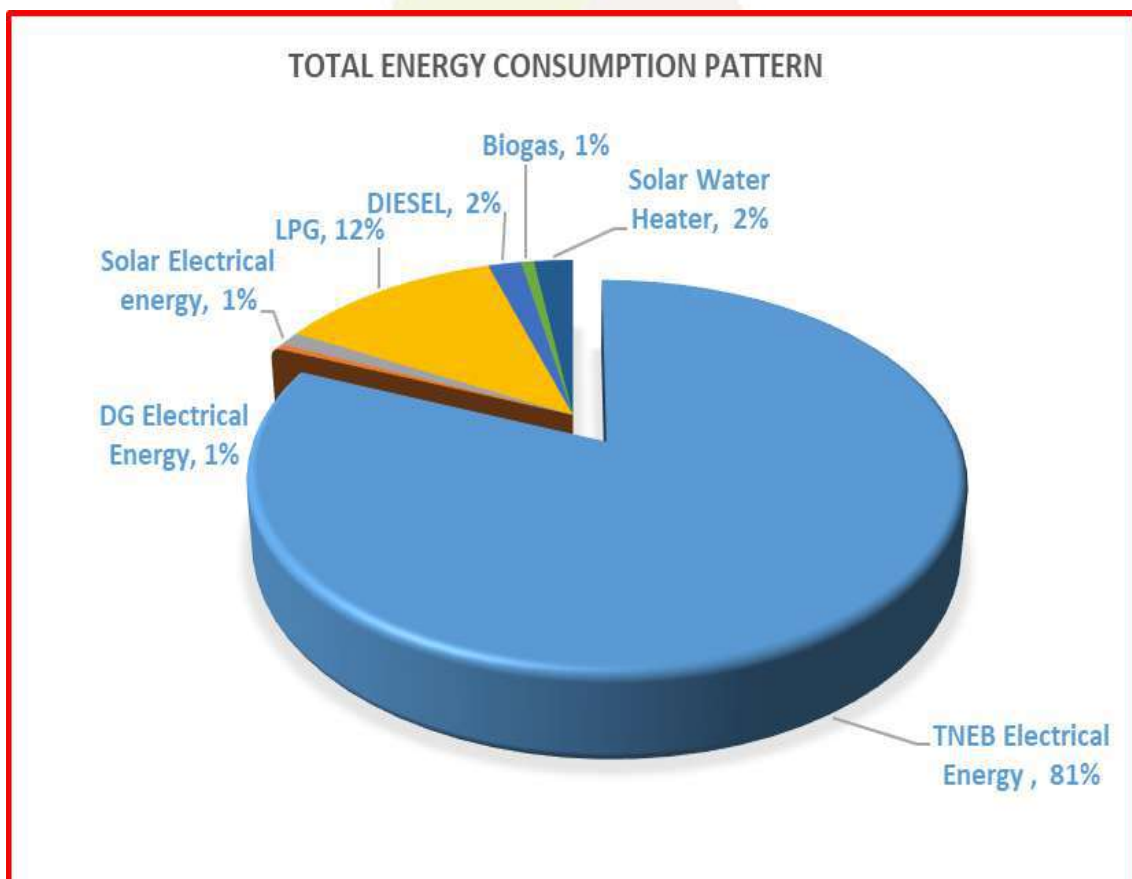
35 M3 capacity X 1(Men Hostel)



15.Total Energy consumption

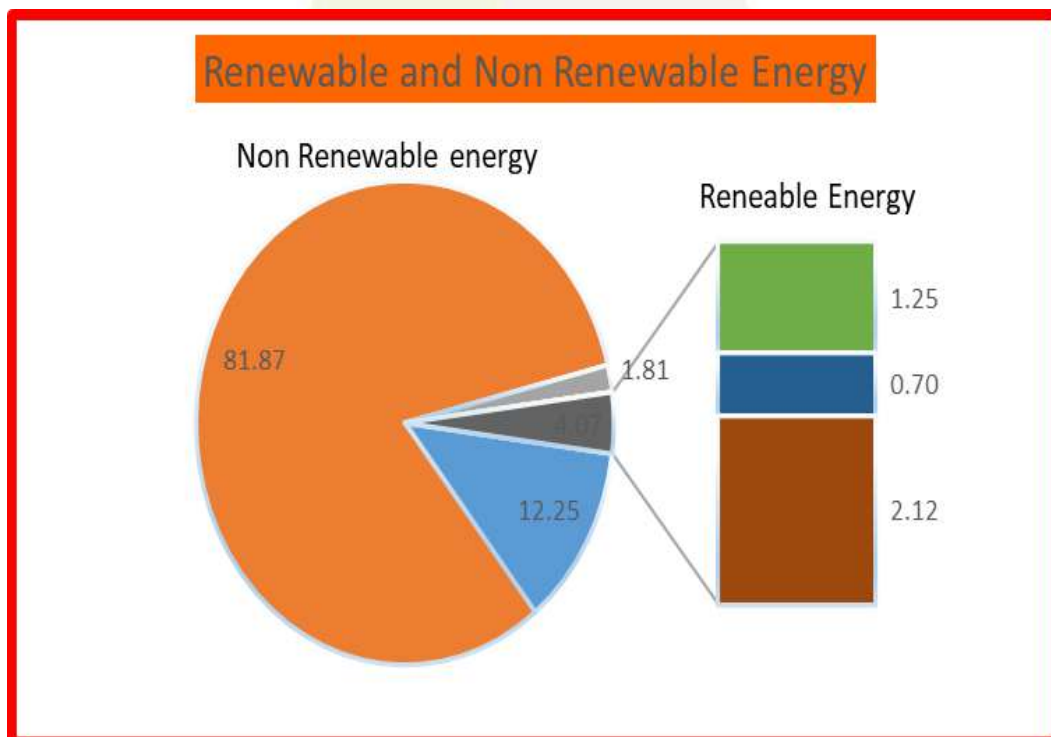
Electrical (Conventional & Renewable) and Thermal(Conventional & Renewable)

SL.NO	TYPE OF ENERGY	ENERGY -GCAL	Percentage
1	TNEB Electrical Energy	489.82	81.41
2	DG Electrical Energy	2.80	0.47
3	Solar Electrical energy	7.53	1.25
3	LPG	73.71	12.25
4	DIESEL	10.87	1.81
5	Biogas	4.20	0.70
6	Solar Water Heater	12.77	2.12
	Total	601.7	100.00



16. Renewable and Non Renewable(Conventional) energy distribution

ENERGY CONSUMPTION	PERCENTAGE	Total
NON RENEWABLE		
LPG	12.25	
TNEB AND DG ELECTRICAL ENERGY	81.87	
DIESEL	1.81	95.93
RENEWABLE		
SOLAR Electrical	1.25	
Biogas	0.70	
Solar Water Heater	2.12	4.07



17.The energy conservation measures followed

- Auto Level controller is provided in all water storage tanks to avoid overflow of water and to save energy.
- Replacing conventional electrical light fittings with energy efficient Light-Emitting Diode (LED) bulbs is going on as continuous process.
- Maximum utilisation of day lights at the hostels and college.
- Staff and Students are made aware of using public transport and college buses and individual vehicle usage is being reduced.
- Periodical maintenance and overhauling of generators is being carried out.
- Periodical maintenance of UPS and Battery systems are carried out.
- The fans, lights, air-conditioners and other electronic and electrical equipments are switched off when not in use.
- Computers are switched to sleep mode or hibernate mode automatically when not in use.
- At the end of every practical session, Computer monitors and UPS are switched off.
- Soft copies are maintained instead of hard copies, to reduce power consumption and paper.
- Work supervisor and electrician regularly check the usage of lights, fans and all other energy sources during and out of the college hours.
- Lights and fans are switched off by the students whenever they are out of hostel rooms

18.Major Electrical loads

UPS load details

JAMAL MOHAMED COLLEGE (AIDED)

Sl.No	DEPARTMENT	CAPACITY & VDC	MAKE	TYPE	FLOOR/ PLACE
1	LIBRARY (JMC)	3KVA/96VDC	NEMERIC	DIG	GROUND FLOOR
2	ATTENDANCE	2KVA/24VDC	KEVIN	DIG	GROUND FLOOR
3	SECURITY GATE	650VA/12VDC	ASSEMBLING	REG	GROUND FLOOR
4	AUM IBRAHIM BLOCK (C.S AIDED)	10KVA/360VDC	GLOBAL	REG	GROUND FLOOR
		1KVA/36VDC	CONSUL	DIG	GROUND FLOOR
5	DEAN OFFICE	850VA/12VDC	SUKAM	DIG	DEAN OFFICE
6	MATHEMATICS	10KVA/240VDC	CONSUL	DIG	1st FLOOR
7	SECRETARY SIR ROOM	2KVA/24VDC	KEVIN	REG	GROUND FLOOR
8	COLLEGE OFFICE	2KVA/96VDC	CONSUL	REG	GROUND FLOOR
9	COLLEGE OFFICE	6KVA/120VDC	RPC	REG	GROUND FLOOR
10	PRINCIPAL ROOM	1450VA/24VDC	ASSEMBLING	REG	GROUND FLOOR
11	ARABIC	6KVA/120VDC	GLOBAL	REG	1st FLOOR
12	ECONOMICS	1KVA/36VDC	NUMERIC	DIG	1st FLOOR
13	PHYSICS	2KVA/72VDC	ASSEMBLING	DIG	1ST FLOOR
14	CHEMISTRY	5KVA/120VDC	CONSUL	REG	GROUND FLOOR
15	WI FI & CCTV UPS	5KVA/48VDC	EXIDE	REG	1st FLOOR
16	ERP ROOM	5KVA/48VDC	EXIDE	REG	GROUND FLOOR
17	INTERCOM DEPT	1450VA/24VDC	KEVIN	REG	GROUND FLOOR
18	GUESTHOUSE	850VA/12VDC	ASSEMBLING	REG	1st FLOOR
19	UGC NODAL OFFICE	1450VA/24VDC	KEVIN	REG	1st FLOOR
20	CS DEPARTMENT	850VA/12VDC	KEVIN	REG	GROUND FLOOR
21	PRINCIPAL ROOM	2KVA/96VDC	CONSUL	DIG	GROUND FLOOR

(KHAJAMIAN HOSTEL)

S.No	DEPARTMENT	CAPACITY & VDC	MAKE	TYPE	FLOOR/ PLACE
1	KHAJAMIAN NET LAB				
2	KHAJAMIAN OFFICE	3KVA/36VDC	ASSEMBLING	REG	GROUND FLOOR
3	AUDITORIUM	3KVA/36VDC	ASSEMBLING	REG	GROUND FLOOR
4	1st MESS	650VA/12VDC	KEVIN	REG	GROUND FLOOR
5	2nd MESS	650VA/12VDC	KEVIN	REG	GROUND FLOOR
6	3rd MESS	650VA/12VDC	KEVIN	REG	GROUND FLOOR
7	4th MESS	650VA/12VDC	KEVIN	REG	GROUND FLOOR
8	5th MESS	650VA/12VDC	KEVIN	REG	GROUND FLOOR
9	6th MESS	650VA/12VDC	KEVIN	REG	GROUND FLOOR

**JAMAL MOHAMED COLLEGE UPS DETAILS
(SELF FINANCE)**

S.No	DEPARTMENT	CAPACITY & VDC	MAKE	TYPE	FLOOR/ PLACE
1	NEW MBA ALMANHAL BLOCK				
		850VA/12VDC	KEVIN	REG	FRONT OFFICE
2	MBA JEDDAH ALUMNI BLOCK	5KVA/120VDC	CONSUL	REG	1st FLOOR
		20KVA/360VDC	CONSUL	DIG	GROUND FLOOR
		2KVA/96VDC	CONSUL	DIG	2nd FLOOR
		5KVA/192VDC	CONSUL	REG	GROUND FLOOR
		1.5KVA/24VDC	KEVIN	REG	GROUND FLOOR
3	SELF FINANCE OFFICE (MEN)	2KVA/96VDC	NEMERIC	DIG	MEN S.F OFFICE
		1KVA/36VDC	NEMERIC	DIG	MEN S.F OFFICE
		2KVA/96VDC	NEMERIC	DIG	WOMEN COM LAB
		1KVA/36VDC	NEMERIC	DIG	MEN S.F OFFICE
4	CONTROLLER OFFICE				
		6KVA/120VDC	GLOBAL	REG	1st FLOOR
5	IT DEPARTMENT	3KVA/96VDC	CONSUL	DIG	1 ST FLOOR
		1KVA/36VDC	NEMERIC	DIG	1st FLOOR
		5KVA/240VDC	NUMERIC	DIG	2nd FLOOR
6	STUDENT BROWSING CENTRE	5KVA/240VDC	CONSUL	DIG	1st FLOOR
7	MSW	1KVA/36VDC	NUMERIC	DIG	GROUND FLOOR
8	BIOTECH & MICRO BIOLOGY	1.5KVA/24VDC	KEVIN	REG	GROUND FLOOR
9	HUSAINUDEEN HALL	1450V A/24VDC	KEVIN	DIG	GROUND FLOOR
10	SF WOMEN OFFICE	1450VA/24VDC	KEVIN	REG	GROUND FLOOR
11	A/C AUDITORIUM	1450VA/24VDC	KEVIN	DIG	GROUND FLOOR
12	MANAGEMENT OFFICE	1KVA/36VDC	CONSUL	DIG	GROUND FLOOR
13	BIO INFORMATICS	1KVA/36VDC	CONSUL	DIG	1st FLOOR
14	POWER ROOM	850VA/12VDC	KEVIN	REG	GROUND FLOOR

(PG NEW HOSTEL)

S.No	DEPARTMENT	CAPACITY & VDC	MAKE	TYPE	FLOOR/ PLACE
1	PG OFFICE	1450VA/24VDC	ASSEMBLING	REG	GROUND FLOOR
2	OFFICE	1450VA/24VDC	KEVIN	REG	GROUND FLOOR
3	NEW MESS	1050VA/12VDC	KEVIN	REG	GROUND FLOOR
4	OLD MESS	850VA/12VDC	BASS	REG	GROUND FLOOR

AC Load details

DEPT	MAKE	MODEL		No of A.C.
		WINDOW	SPLIT	
Bio-technology	Voltas		4	14
	Voltas			
	O.G		10	
	O.G			
Microbiology	O.G	1	2	11
	O.G			
	Carrier	1		
	Bluestar		7	
Bio-informatics	Onida		4	4
Hotel Mgt	O.G	1		3
	Carrier	1		
	Voltas		1	
GCC	Voltas		4	5
	Daikin		1	
Guest House	Carrier		2	3
	Voltas		1	
Commerce	L.G.		10	14
	Carrier	4		
Zoology	O.G	2		9
	Voltas	1	2	
	LG		3	
	Blue star		1	
Physics	O.G	3		7
	Voltas		1	
	Carrier	2		
	LG		1	
Student Browsing	LG		5	5
I.T. Block	Godrej		12	44
	O.G		5	
	Blue Star		2	
	LG		25	
Principal Room	Carrier	2		6
	LG		1	
	OG		3	
V.P Room	Daikin		1	1
Secretary room	O.G		2	5

	Daikin		2	
	LG		1	
Conference hall	O.G		3	3
Botany Dept	L.G		3	7
	Voltas		2	
	Blue Star		2	
M.B.A	O.G		34	42
	Carrier	1		
	Onida		5	
	Voltas		1	
	LG		1	
Urdu CS Lab	L.G		2	2
COE	Carrier	2		17
	Samsung		1	
	LG		1	
	OG		2	
	Voltas		11	
New M.B.A	O.G		37	44
	Onida		1	
	Blue star		6	
Maintenance	O.G		1	1
Masjid	Voltas		1	11
	OG		10	
Chemistry	Daikin		1	8
	LG		4	
	Carrier	3		
K.M.H.Hostel	O.G		1	20
	LG		2	
	Voltas		1	
	Blue Star		6	
	Carrier		10	
P.G Warden	O.G		3	5
	LG		2	
Computer Science	O.G		8	21
	LG		3	
	Voltas		7	
	Blue star Cassete		1	
	Vestar		2	
A.C. Auditorium	OG		20	35
	LG		1	

	Voltas		2	
	Blue Star		5	
	Blue Star Cassete		1	
	Daikin cassette		6	
Hussainudin Hall	LG		7	7
English	LG		3	3
History	LG		2	3
	Daikin		1	
Tamil	LG		2	2
FT	LG		2	5
	Blue star		3	
PD	LG		2	2
Arabic	LG		1	2
	Voltas		1	
College Office	LG		9	9
Management Office	LG		1	1
Purchase	Voltas		1	1
Economics	LG		6	7
	Onida		1	
Hindi	LG		1	1
Maths	LG		3	6
	Voltas		1	
	Godrej		2	
Nutrition	Samsung		1	2
	Voltas		1	
JMC IAS Academy	Blue star		2	2
English S.F	Voltas		3	3
Students Counseling Centre	O.G		1	1
N.M.K Auditoriam	Amtrex(Ductablesplit)		2	12
	Daikin Cassette		1	
	L.G		2	
	Daikin		2	
Doctor`s Room	Voltas		1	1
U.G.C			1	1
Nodal office			1	1
Director office			1	1

Lighting Load

- Total Connected Load- 1012.91 KW
- Total Lighting Load- 118 KW
- LED lights-1048 numbers
- LED power- 20watts
- LED lighting load- 20.96 KW
- Lighting load on total load -11.65 %
- LED lighting load on total Lighting load -17.76%
- LED lighting load on total load-2.07 %

19.COMMON OBSERVATION AND FEEDBACK

1. HT transformer area Fire Extinguishers are to be kept under weather protected cover and to be serviced
2. HT hand gloves to be maintained in a good condition
3. HT transformer area fencing to be painted
4. HT transformer area unwanted vegetation growth on earth pits and walkway area to be removed
5. Fire Extinguishers kept on college walls are easily accessible and operable
6. Fire Extinguishers kept in Hostel DG areas are to be relocated for easy access
7. Fire sand buckets to be kept in the hostel kitchen LPG storage area
8. LPG storage areas are well ventilated and neatly maintained. House -keeping is good
9. Hands on training to operate Fire Extinguishers shall be given to all teaching and non- teaching staffs on periodical manner
10. Lightning system is available inside the campus
11. Earthing system for Diesel Generator are fixed properly.
12. Women's Hostel DG sets earth pits to be maintained properly. Earth pits are covered by cement/ tiles
13. Unwanted materials to be removed from power room
14. Energy conservation program for all staffs shall be planned.
15. Display on Emergency contact numbers shall be posted on prominent places
16. Maintenance details are well maintained for all UPS and batteries.
17. Battery Purchase details, Warranty periods to be maintained.
18. Five star rated energy efficient appliances to be procured in the future

20. Power Quality Analysis

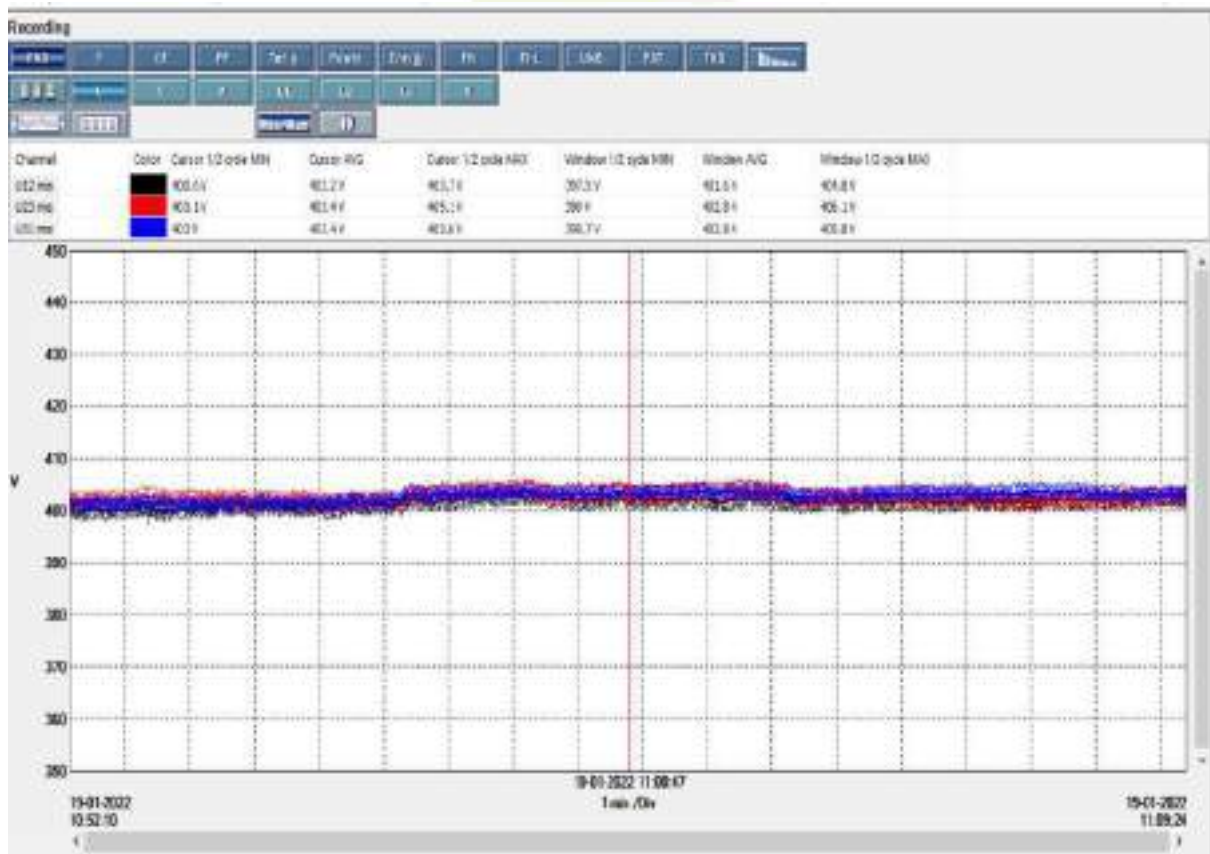
Main Incomer HT Service 06 909 442 0210

HT Service, Tariff IIB , Permitted MD 250KVA

Measurement taken at 77 % load

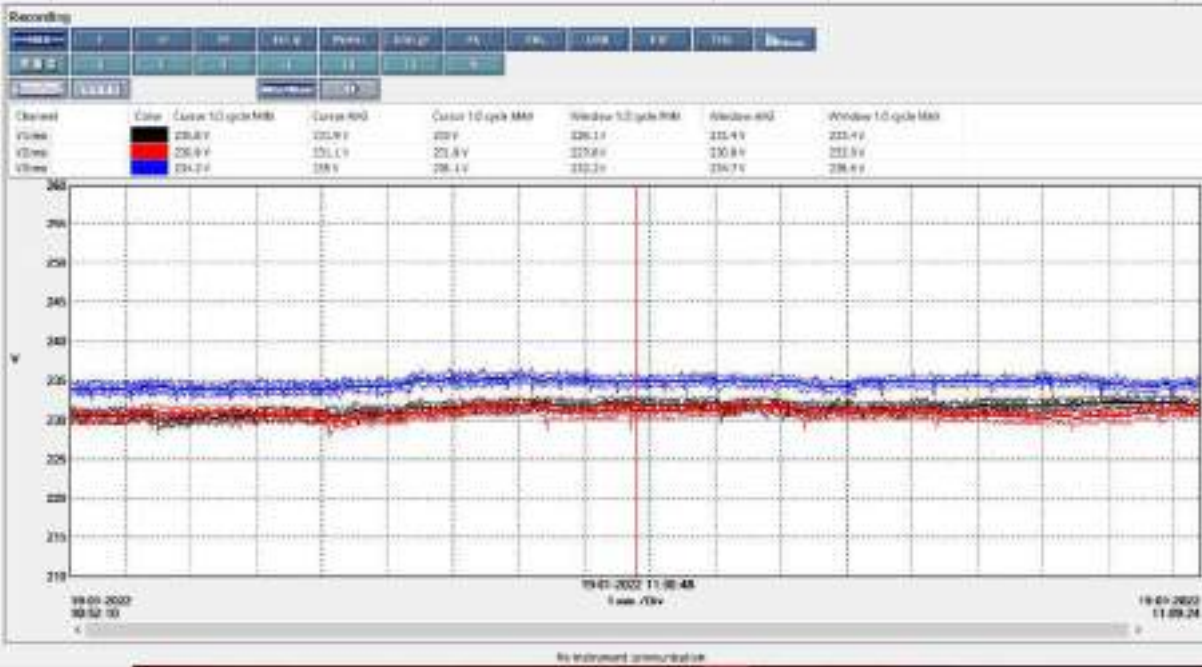
20.1. Phase to Phase Voltage Readings:

RY	YB	BR
401.6V	402.8V	402.8V



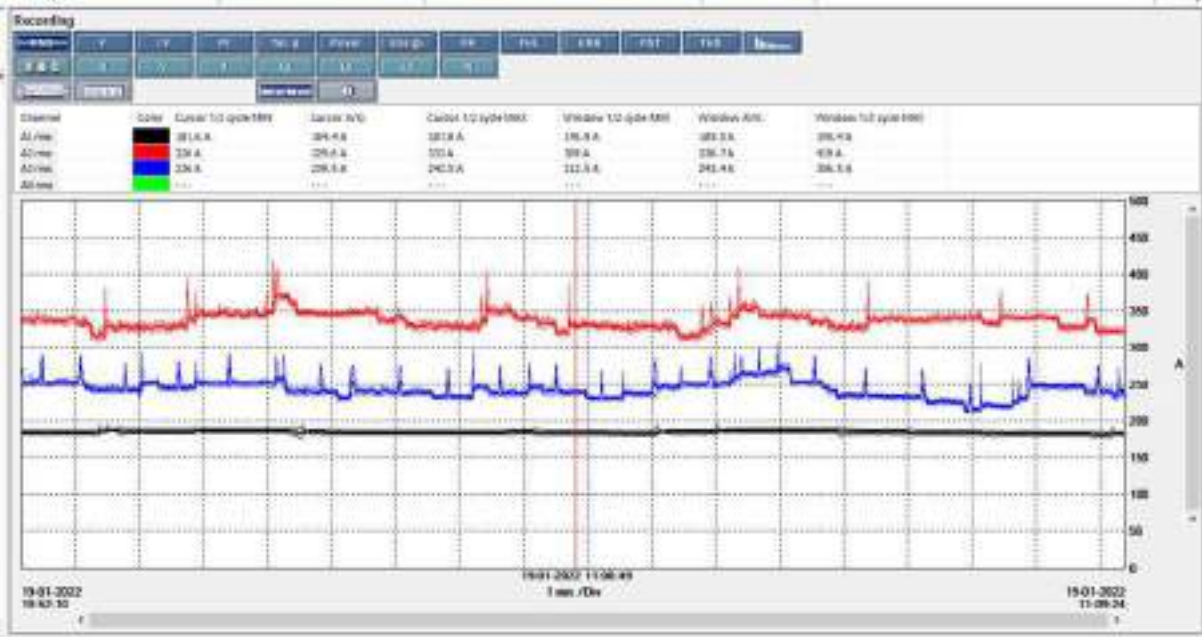
20.2. Phase to Neutral Voltage Readings:

R-N	Y-N	B-N
231.4V	230.9 V	234.7 V

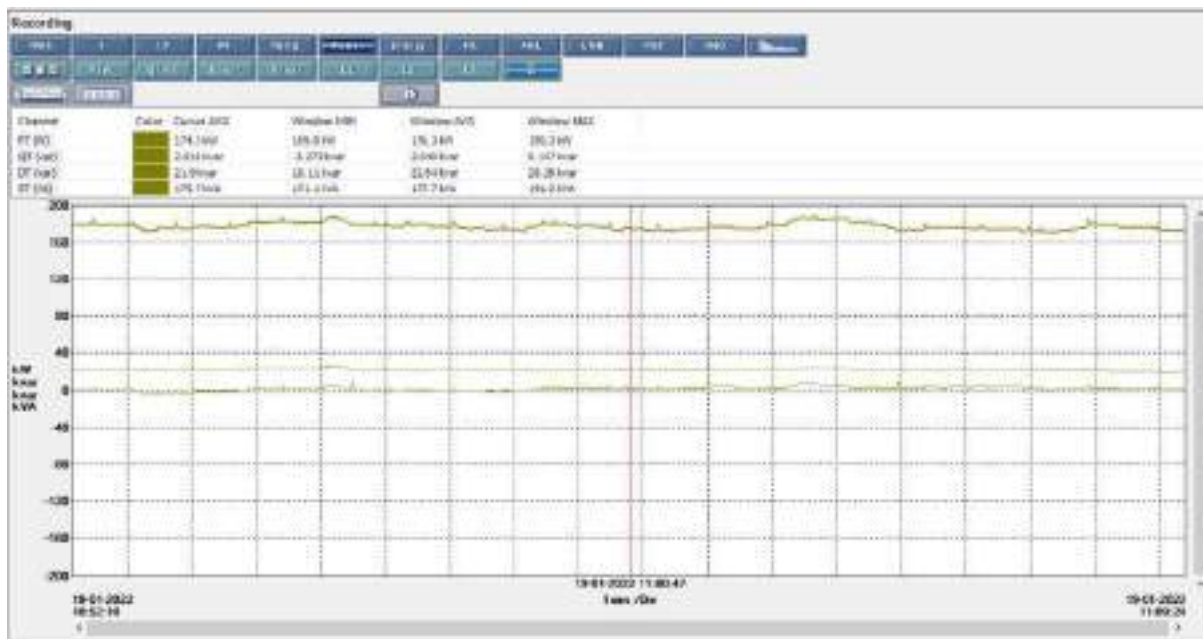


20.3. Current Readings:

R	Y	B
176.9 A	309A	212.2 A



20.4. Total Power (KW):



Maximum Power Reached is 189.3KW

20.5. Power Factor:



Power factor is 0.909- 0.994 is maintained

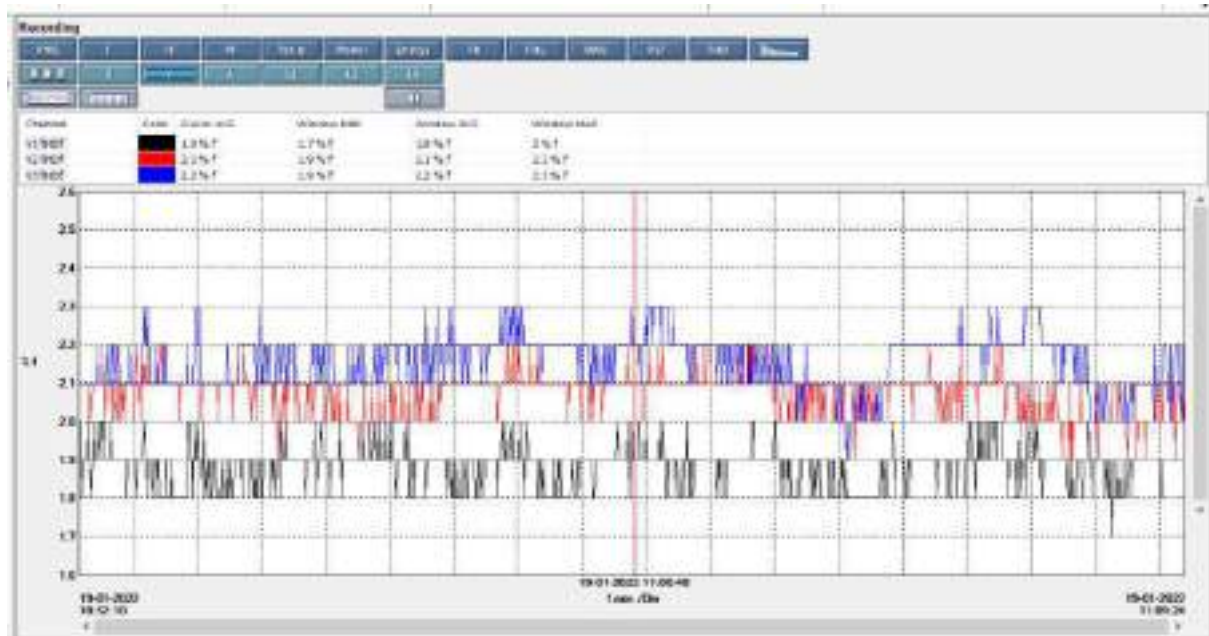
20.6.Voltage unbalance



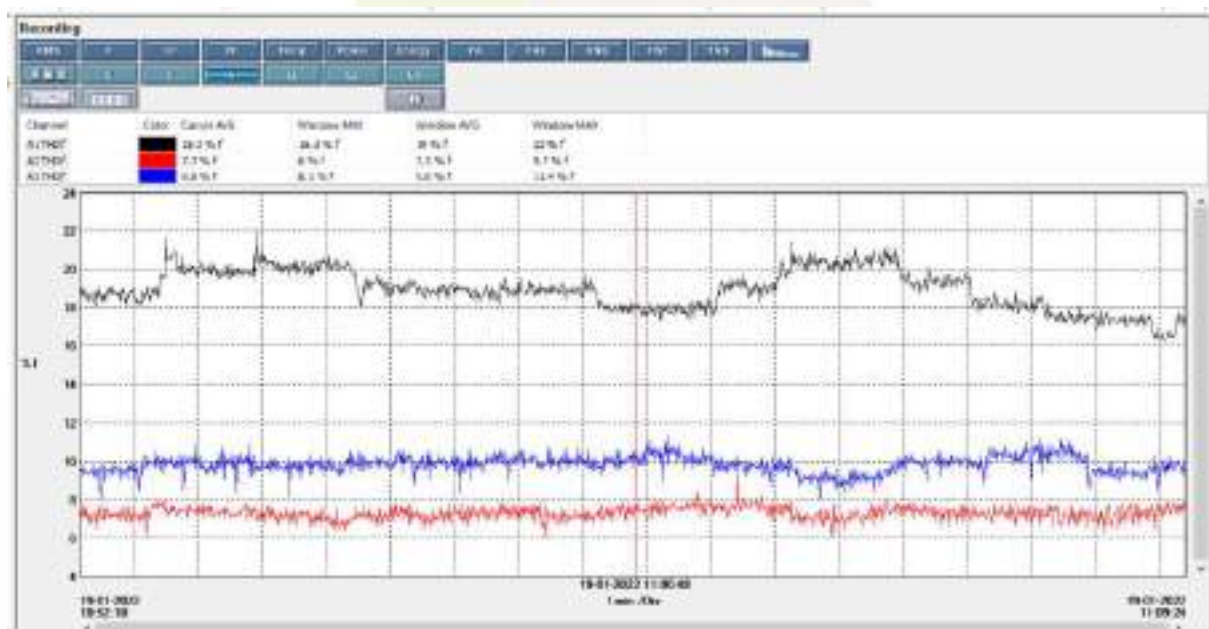
20.7 Current Unbalance



20.8 Voltage -Total Harmonics Distortion

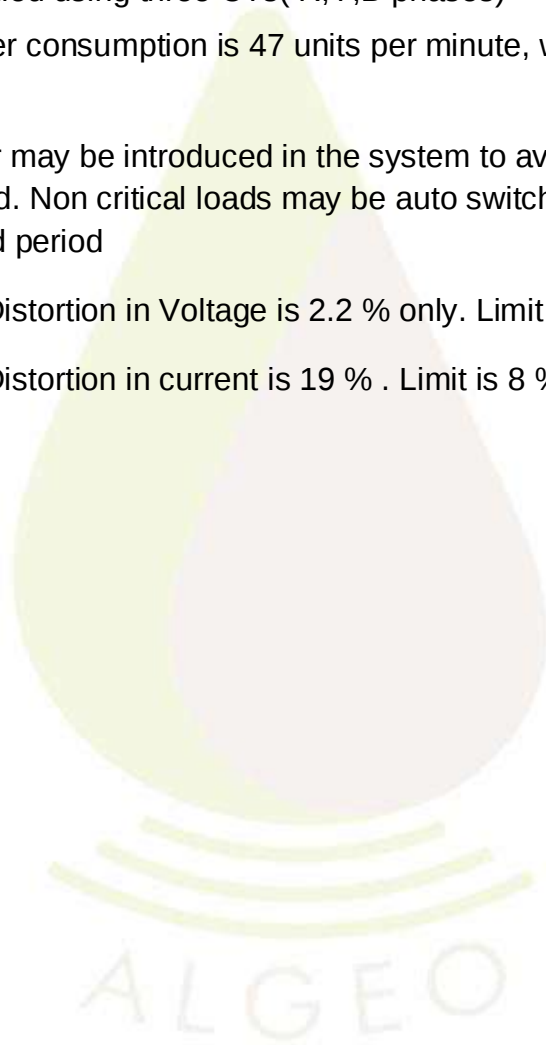


20.9 Current- Total Harmonics Distortion



20.10. Remarks & Recommendations on Power Quality

1. Voltage is balanced in three phases. Unbalance is 1%, Limit is 3%
2. Current unbalance is 31.9 % . Limit is 10%, Possibilities of Load sharing to be studied
3. Power Factor(PF) is maintained above 0.9. In the present system, Power Factor is controlled using single CT in R phase. To avoid Power factor penalty, PF is to be controlled using three CTs(R,Y,B phases)
4. At 77% load, power consumption is 47 units per minute, which is equal to 2820 units per hour
5. Demand controller may be introduced in the system to avoid penalty on Maximum Demand. Non critical loads may be auto switched off during the maximum demand period
6. Total Harmonics Distortion in Voltage is 2.2 % only. Limit is 4%
7. Total Harmonics Distortion in current is 19 % . Limit is 8 %



21. AUDIT FINDINGS & ENERGY SAVING POTENTIAL

21.1 Findings

- Annual electricity consumption from TNEB GRID is 569555 units during the year 2020-2021. **Energy consumption is less compare to previous years due to online classes**
- Electrical Energy consumption from Diesel Generator – 3261 units.
- Solar Power Electrical energy consumption (Women's Hostel)- 8,750 units
- Total Electrical Energy consumption from EB,DG and Solar – 5,81,566 units.
- LPG consumption -6,194 Kgs
- Diesel Consumption for transport -1,162 Litres
- Biogas generation- 1,051 Kgs
- Lot of Energy conservation initiatives are taken.
- Due to Corona, Solar Power plant was not operated to its full capacity. In future, solar power plant to be utilised to the maximum possible way to consume more renewable energy
- Additional Solar power plant shall be planned in future for HT service.
- More Renewable energy utilisation shall be planned in the coming years
- Conduct more awareness programs on importance of energy saving for students and staff
- Remaining Conventional Tube lights shall be replaced with LED tube lights in a phased manner
- 5 Star rated Energy efficient electrical equipments shall be procured in future
- Power Factor of HT service to be monitored on daily basis and to be maintained above 0.9 value
- May be shift over to Electric Buses (E- Vehicle) in a phased manner
- For transport buses, Part quantity of Bio Diesel shall be planned in future
- In total Lighting loads, 12.7 % lighting loads are converted into LED lighting system. Remaining Conventional Tube lights shall be replaced with LED tube lights in a phased manner

21.2 Renewable Energy

- Minimum energy consumption during Lockdown period was around 4500 units per month in HT service.
- Average energy consumption during normal days are around 30,000 units per month in HT service
- Solar power plant shall be planned in a phased manner in future to achieve 50 % renewable energy target
- Solar Power plant (50KW) available at Women's Hostel to be utilised to the maximum possible level
- 1KW solar plant generates 1500 units per year, Avoids 0.7 KG CO₂ per unit,
- 1KW solar plant 's generation energy per year is equal to 50 Grown up trees ' CO₂ absorption per year

Lighting Load

- LED lighting load on total Lighting load -17.76%

Energy saving potentials

1. Conventional tube lights shall be replaced with LED tube lights

Conventional tube light (with electronic choke) energy consumption-40 watts/hr

LED Tube lights energy consumption-20 watts/ hr

Savings per tube light -20 watts/hr

No of hours usage per day in the hostel– 10 hrs

No of days hostel occupied with students-275 days(During normal Days)

Energy savings per tube light per year -275 x10x20= 55,000wh=55 units

Average energy cost- Rs 8/unit

Cost saving per year per tube light-55 x 8 = Rs 440

Cost savings per month-Rs 36.6

Approximate Cost of LED tube light -Rs 200

Payback period-5.5 months

Replacement cost for 100 LED tube lights-Rs 200x100= RS 20,000

Cost savings for 100 LED tube lights-Rs 44,000 / year

Energy savings for 100 LED tube lights-5,500 units/ year

Payback period-5.5 months

2. Conventional fans shall be replaced with energy efficient fans

Conventional FAN energy consumption-75 watts/hr

ENERGY efficient fan energy consumption-28 watts/ hr

Savings per fan -47 watts/hr

No of hours usage per day in the hostel– 16 hrs

No of days hostel occupied with students-275 days (During normal Days)

Energy savings per fan per year - $275 \times 16 \times 47 = 206,800 \text{wh} = 207 \text{ units}$

Average energy cost- Rs 8 /unit

Cost saving per year per FAN- $207 \text{ units} \times 8 = \text{Rs } 1656$

Cost saving per month-Rs 138

Cost of ENERGY EFFICIENT FAN -Rs 2800

Payback period 20 months

Replacement cost for 100 Nos. ENERGY EFFICIENT FAN-Rs $2,800 \times 100 = \text{RS } 2,80,000$

Cost savings for 100 Nos. ENERGY EFFICIENT FAN -Rs $1,65,600 / \text{year}$

Energy savings for 100 Nos. ENERGY EFFICIENT FAN - $20,700 \text{ units/ year}$

Payback period 20 months

JAMAL MOHAMED COLLEGE (*Autonomous*)

COLLEGE WITH POTENTIAL FOR EXCELLENCE
Reaccredited (3rd Cycle) with 'A' Grade By NAAC
(Affiliated to Bharathidasan University)

**TIRUCHIRAPPALLI – 620020,
TAMILNADU, INDIA.**



ENVIRONMENTAL AUDIT REPORT 2020-2021



AUDIT/REPORT BY



ALCHEME GREEN ENERGY COMPANY

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ACKNOWLEDGEMENT

We at Alcheme Green Energy Company, Madurai are thankful to the Principal for giving us the opportunity to carry out Environmental audit of Jamal Mohamed College Trichy -620 020, Tamilnadu, India. Alcheme Green Energy Company team is also thankful to all other supporting Officers / Staffs of the above institute for their wholehearted support, hospitality and the courtesy extended to the Audit team during the course of the visit.

The following officers from Alcheme Green Energy Company under the guidance of Mr. C. Jebaraj, B.Tech., have carried out the Environmental Audit.

Name	Qualifications	Certification Number
Mr. C. Jebaraj	B.Tech., PDGEM., DIS., BEE Certificated Energy Auditor, IRCA Certified Lead Auditor - OHSMS Internal Auditor - ISO - QMS	EA-9847
Mr. S. Lakhsmana Kumaran	B. Tech., MSc (Env. Science)., M.B.A. Lead Auditor- Environment	-

The following staff from the Institution were participated in the audit process

Name	Designation
Dr. T. Abdul Razak	Coordinator, IQAC
Dr. A. Jafar Ahamed	Associate Professor of Chemistry Core Member, IQAC
Dr.M. Syed Ali Padusha	Associate Professor of Chemistry Coordinator, Khajamian Hostel
Dr. B. Sirajudeen	Associate Professor of Tamil In-Charge, Campus Maintenance
Mr. M. Shaik Mohideen	Electrician – (Training Instructor- Sp. Gr.)

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Summary of Environment Audit

Environment audit of Jamal Mohamed College and its Hostel was carried by Alcheme Green Energy Company. Audit team has gone through the data related to Water and Electrical Energy, Waste generation, Waste Management, Waste Recycling and Reuse, Green Belt Development of the Institution both inside and outside the campus. The team also carried out the study of Pollution abatement measures, Rainwater harvesting, Water and Energy Conservation measures taken to reduce the pollution, noise level, Greenhouse gas emission and maintain Ambient Air quality.

During the visit, it is observed that cleanliness in the campus is well maintained through proper disposal of wastes, utilization of eco-friendly supplies and effective recycling program. The concept of eco-friendly culture is disseminated among the students through various seminars/workshops and community-oriented programs. The Institution strictly follows reduce, reuse and recycle method to limit energy usage and partially replace non-renewable energy sources with renewable energy resources.

The environment audit report is a very powerful and valuable communications tool to use while working with various stakeholders who need to be convinced that systems and procedures in place are suited to cope with natural changes and modifications.

It is hoped that the results presented in the environment audit report will serve as a guide for educating the college community on the existing environment related practices and resource usage at the college as well as spawn new activities and innovative practices.

The audit outputs and recommendations are summarised as follows:

Noteworthy activities

- Clean, Green and plastic free campus
- Excellent Waste management system
- Milk for the hostel mess is brought through milk cans only. No pocket milks
- Biogas generation from Night soil and food waste
- Renewable energy utilisation both thermal and electrical
- Very good exhaust system arrangement has been made at Women's Hostel's incinerator to disperse the smoke and vapours to improve Indoor Air Quality
- Excellent drinking water distribution system throughout the College and Hostels

The audit outputs and recommendations are summarised as follows:

- Air pollution impact on Ambient Air quality is negligible since the quantity of fuel used for combustion in the institution is very less
- Noise levels inside the campus are within the prescribed limit
- Very good initiative is taken by the institution to reduce paper consumption, collection of waste paper and disposal for recycling
- Lot of initiatives are taken to conserve Water and Energy by the Institution.
- Flow meters are to be provided for better water management
- Total water consumption for Jamal Mohamed College and Hostel –246 KL/Day
- Electrical Energy consumption from TNEB GRID alone –5,69,555 units (Less due to more number of on line classes because of Corona)
- Diesel Generator electrical energy consumption- 3261 units
- Solar Power electrical energy consumption-8750 units
- Total Electrical Energy consumption is 5,81,566 units
- Total Green House Gas Emission is 680.9 t CO₂e
- Green House gas reduction due to renewable energy utilisation and grown up trees is 39.5 t CO₂e
- Net Green House Gas emission is 641.4 t CO₂e
- Green chemistry procedure is followed in the department of chemistry to carry out research work thereby reducing the use of harmful solvents

We are happy to submit this detailed Environmental audit report to the Jamal Mohamed College



For Alcheme Green Energy Company
Madurai

1. Introduction

1.1 Environmental Policy

Jamal Mohamed College has well formulated Environmental Policy to guide all its activities.

The main objectives are as follows:

- ❖ To Reduce, Reuse, and Recycle the resources consumed by our institution
- ❖ To achieve sound environmental practices across our entire operation.
- ❖ To minimise our waste and reduce our water consumption wherever possible.
- ❖ To create awareness among our faculty members and students, training them to meet our objectives.

The Institution vouchsafes:

- ❖ Identifying the environmental impacts and aspects of operations and ensuring that we meet our compliance obligations.
- ❖ Establishing environment programs that are consistent with our commitment to the continual improvement of the environment management system.
- ❖ Compliance with applicable environmental policies and prevention of pollution by applying the best available practices



2. WATER

2.1 Water usage at Jamal Mohamed College

Total number of students studied during the academic year 2020-2021: 12,225

Teaching & non-Teaching staff in the institution during the academic year 2020-2021: 774

Total number of stake holders: 12,999

Water for college and hostel

Corporation water through Tanker Lorry- 1,38,000 litres/day

Borewell water-1,08,000 litres/day

Total water usage -2,46,000 litres/day

Main water uses in the College campus are Drinking, Rest room, Canteen and Lab

Water usage in the College- 92 KL / Day

Water usage on College working day per stakeholder per day in the college – 7.52 litres

Water usage at College

Sl. No	Place	Water usage Quantity Litres / Day
1	Drinking	13,000
2	Rest room	48,000
3	Canteen	13,000
4	Lab	8,000
5	Garden	9,000
6	Construction	1,000
	Total	92,000

Waste water generation in the college – 69 KL/day

2.2 Water usage at Hostel

Number of students and staff residing in the hostel in the year 2020-2021: 1896

Main water uses in the Hostel are Drinking, Washing of clothes, Cooking & Vessel cleaning and for Rest room

Water usage at Hostel(Men and women) - 154 KL / Day

Water consumption per day per stakeholder in the hostel – 81.2 litres

Water usage at Hostel(Men and women)

Sl. No	Place	Water usage Quantity Litres / Day
1	Drinking	4000
2	Cooking	4000
3	Rest room	42,000
4	Bathing	40,000
5	Clothes washing	52,000
6	Vessel Cleaning	12,000
	Total	154,000

Waste water generation in the Hostel – 146 KL /day

3. Electrical Energy

3.1 ELECTRICAL ENERGY CONSUMPTION TNEB and DG IN THE COLLEGE AND HOSTEL in 2020-2021

Electrical Energy Consumption - TNEB and DG		
TNEB-College		units
1	HT service	125230
2	LT service	237498
TNEB-Hostel		
1	Men's Hostel	152307
2	Women's Hostel	54520
DG Set		
1	Both College and Hostel	3261
Total		572816

Total Electrical Energy consumption from TNEB grid and DG in the College and Hostel 5,72,816 units

Electrical Energy consumption per stakeholder per year – 44.06 units/year

4. FUEL CONSUMPTION

4.1 LPG

LPG gas is used in the hostel for cooking and used in the college lab for heating

LPG cylinders used- commercial cylinders of 19 kgs capacity

- Total LPG consumption during the year 2020-2021- 6194 KGs

5. Waste Generations and Management

5.1 Liquid and Solid Waste Generation

- Waste water generation in the College - 69 KL /day
- Waste water generation in the girls Hostel – 146 KL /day
- Boys Hostel – 66 KL / day

College

- Biodegradable—<5 kg/day

Office

- Non-biodegradable —< 0.5kg/day

College Canteen

- Biodegradable —< 15 kg/day
- Non-biodegradable —<0.5kg/day
- Aluminium foil —<0.1kg/day

Hostel

- Biodegradable(Food waste) – 100-300 kg/day
- Non-biodegradable – <0.5kg/day

Open area

- Biodegradable (Dry leaves)- 10-20 Kgs/Day

Plastic waste

- Less than 1Kg per day

e-Waste

- Less than 200 kgs/year

5.2 Waste Management

5.2.1 Liquid waste Management

- The night soil produced by the hostels are directed to a total of three biogas plants from which fuel gas(Biogas) is produced.
- College has a large mechanical filtering system to process grey water



The grey water produced is preliminarily treated and filtered through a stagnation filter assisted by live herbaceous plants which absorb nitrate, phosphate and other pollutants. Then the treated water is let into the coconut farm for irrigation. RO plant reject from industrial type is used for gardening purpose.

5.2.2 Bio-degradable waste management

- ❖ Bio-Degradable and non-biodegradable waste are collected in separate bins provided. ,
- ❖ Compost pit has been constructed to decompose kitchen waste by employing enriched microbial culture as well as vermicompost method
- ❖ Dry leaves are collected separately, dumped in the pits and converted into Bio fertilizer and used as bio fertiliser
- ❖ The egg shell waste are separately dried and powdered in grinder and used as an additive in compost produce. This mixture is used as manure for organic recovery plot, where vegetable are grown without chemical fertilizers.

5.2.3 Plastic Waste Management

- The college has been declared as a 'Plastic Free' zone.
- Milk for the hostel mess is brought through milk cans only. No pocket milks
 - Use of polythene bags, plastic cubs and laminated papers are prohibited.
- Students and staff are advised to bring cloth bags
- All the stake holders are motivated to use stainless steel water bottles and lunch boxes.
- Plastic utensils in the stores, canteen and hostel kitchen are replaced with stainless steel plates, tumblers etc
- Plastic waste that comes in through lab equipment's package, empty chemical containers etc. are collected separately and disposed periodically for recycling

5.2.4 Used Battery Management

- Used batteries are disposed through Buy back method

5.2.5 e-Waste Management

- All electronic machineries are purchased under Buy-Back agreement for proper disposal of e waste to recycler

5.2.6 Other Solid Waste Management

- Egg cells are collected separately and used for calcium enrichment
- Solid wastes generated from damaged furniture are sent to waste wood collection centre. Useful furniture and other wooden materials are made from the waste
- Glass wastes are disposed periodically through municipal waste collection system.

6. Pollution abatement measures

6.1 Waste Reduction

- ❖ Green Chemistry is followed in the chemistry lab to reduce the hazardous waste generation
- ❖ Students are instructed not to waste paper while writing examinations.
- ❖ Reusing one side paper
- ❖ Where ever possible, printing on both sides of papers
- ❖ In order to reduce the use of paper the following initiative were taken by E - Governance
 - Attendance
 - Payment of fees
 - Submission of e-assignment through email
 - Digitalisation of Staff profiles and details about students
 - E – Circular through SMS, WhatsApp or Email
 - Online Admission Process – Printing of applications reduced & submission of applications through admission portal.
 - All inter department communications are through intranet
 - Online exams are conducted to reduce the paper usage.

6.2 Waste Recycling

- Recyclable papers are collected and kept and disposed as mixed waste to paper mills through authorized Vendors.
- The answer scripts after the publication of results are sent for recycling.
- e wastes are collected and sent to authorised recycler.

6.3 Waste Reuse

- Reuse one sided paper
- Reuse Envelopes

6.4 Waste to wealth

Kitchen waste are converted into bio fertilizer

Compost plot has been constructed to decompose kitchen waste by employing enriched microbial culture as well as vermicompost method

The vermicompost along with enriched microbial compost method is used to process the kitchen waste from the hostels



Compost plot for decomposing kitchen wastes



vermicompost facility.

The processed kitchen waste is effectively used to fertilize the organic farm in the recovery plot

Biogas plants installed- 25 M3 capacity X 2(Each one at Men & Women Hostel)

35 M3 capacity X 1(Men Hostel)

Men's Hostel- 2004	
Men's Hostel- 2010	
Women's Hostel- 2005	

The night soil produced by the hostels are directed to a total of three biogas plants from which fuel gas is produced. The gas is used in the mess kitchen at an average of 12 Kg methane per day.

- The egg shell waste are separately dried and powdered in grinder and used as an additive in compost produce. This mixture is used as manure for organic recovery plot, where vegetable are grown without chemical fertilizers.



6.5 Water Conservation initiatives

- Level controller are provided to reduce the wastage of water
- Industrial type RO Plant water rejects are used for garden
- Periodical preventive maintenance are carried out to avoid leakages



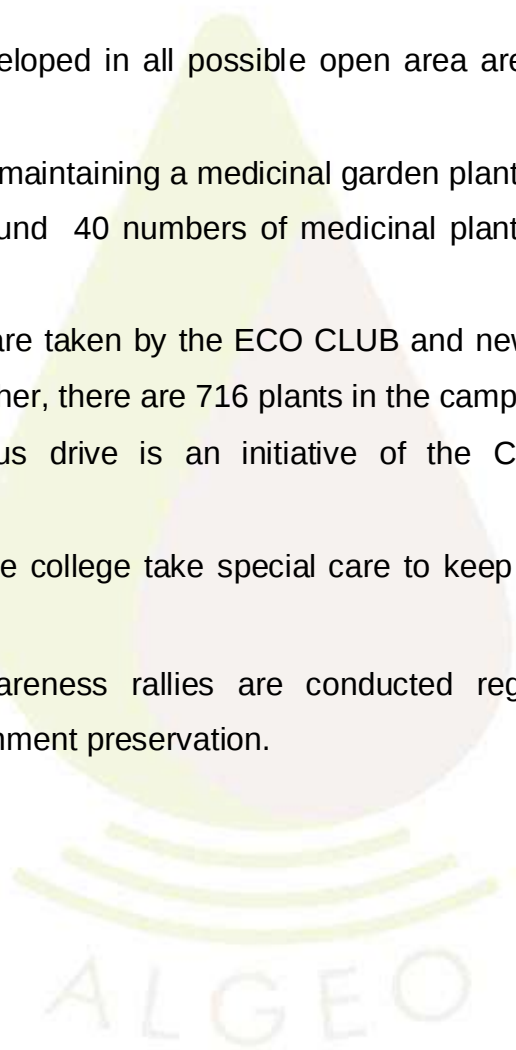
6.6 Energy conservation activities followed

- Auto Level controller is provided in all water storage tanks to avoid overflow of water and to save energy
- Replacing conventional electrical light fittings with energy efficient Light-Emitting Diode (LED) bulbs is going on as continuous process
- Maximum utilisation of day lights at the hostel and colleges
- Staff and Students are made aware of using public transport and college buses and individual vehicle usage is being reduced
- Periodical maintenance and overhauling of generators is being carried out
- Periodical maintenance of UPS and Battery systems are carried out.
- The fans, lights, air-conditioners and other electronic and electrical equipments are switched off when not in use.
- Computers are switched to sleep mode or hibernate mode automatically when not in use.
- At the end of every practical session, Computer monitors and UPS are switched off.
- Soft copies are maintained instead of hard copies, to reduce power consumption and paper.
- Work supervisor and electrician regularly check the usage of lights, fans and all other energy sources during and out of the college hours.
- Lights and fans are switched off by the students whenever they are out of hostel rooms

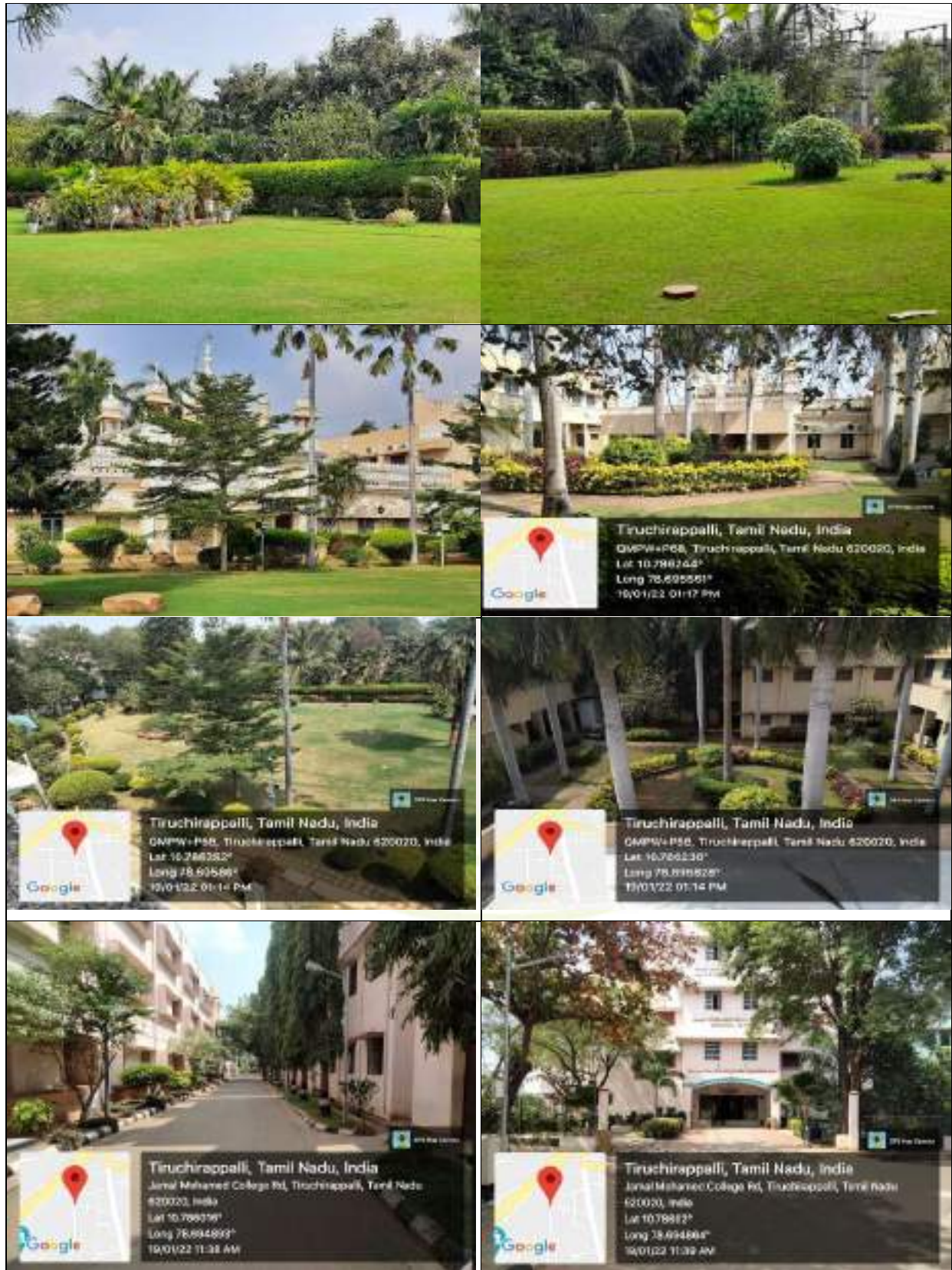
7.Green Belt Development

Jamal Mohamed College, Trichy being located in the regime surrounded by agriculture based villages, naturally the institute is overwhelmed with the atmosphere of greenery. The Institution too does ever take meticulous efforts to maintain and retain the Nature given atmosphere with planting of new saplings The campus is lush green with gardens, lawns and plants wherever there is open space

- The eco-friendly ambience of the campus is a noteworthy feature of Jamal Mohamed College
- Green belt is developed in all possible open area are being converted into greenery
- The ECO CLUB is maintaining a medicinal garden plants which is spread over 300 sqft area. Around 40 numbers of medicinal plants are there inside the campus
- Special initiatives are taken by the ECO CLUB and new saplings are planted every year. Altogether, there are 716 plants in the campus.
- The Green campus drive is an initiative of the College to protect the environment.
- The Eco club of the college take special care to keep the campus neat and green.
- Environmental awareness rallies are conducted regularly to spread the message of environment preservation.



Green Belt Development



8.Rainwater Harvesting

Rainwater Harvesting

At Jamal Mohamed College, rainwater harvesting is done effectively to enhance the ground water level. The institution has rainwater harvesting pits at various locations and they are being maintained properly. The water drained during the rainy season is allowed to flow into the pits constructed in various places inside the campus including the Hostel Premises.

Rainwater recharge pit- 53 Numbers



Rainwater collection sumps-3 Numbers

Rain water Storing sump in Department of Chemistry:

This Rain water utilized by the **Chemistry Laboratory Since 2005.**

Capacity of the tank: 25.65KL

Size: 15x10

Since the rainwater is similar to distilled water which is utilized by students throughout the year

Rain water collection sump in front of chemistry department



9. AMBIENT AIR

9.1 Green House Gas Emission

Release of carbon dioxide into the atmosphere is contributes to the global warming and increasing the pace of climate change. More trees in the campus will make a source of sink for the carbon dioxide and for other greenhouse gases

Green House Gas -Emission during the year 2020-2021

• Green House Gas emission due to diesel	6004.8 Kg CO ₂ e
• Green House Gas emission due to petrol	189149.6 Kg CO ₂ e
• Green House Gas emission due to LPG	18767.8 Kg CO ₂ e
• Green House Gas emission due to Grid power	467035.1 Kg CO ₂ e
• Total GHG emission	680957.3 Kg CO ₂ 680.9 t CO ₂ e

9.2 Ambient Air Quality

Flue gas emission sources

- LPG combustion at hostel, canteen and labs
- Diesel generator at College and Hostel
- Incinerator at Women's Hostel

Fuel consumption per year

- LPG -6,194 Kgs
- Diesel for generator – 1,162 litres

Fuel consumption per day

- College workings days -165 (On line and Offline)
- Off line working days-79 days
- Hostel occupied with students -79 days
- Average LPG consumption per day- 78.4 kgs
- Average diesel consumption per day-7.04 litres

Combustion of LPG is NOT CONTINUOUS process

DIESEL Generator will run only when TNEB grid power fails

Considering the above situation, the quantity of flue gas emission and the impact on ambient air quality from the above combustions are negligible

Incinerators at the Women's Hostel

In the Hostel, incinerators have been kept in all the floors and all the incinerators are connected through exhaust duct.

Inside the College campus, 2 Nos Napkin Vending Machines and 4 Nos incinerators are available

The exhaust duct has been extended to the top of the building to disperse the smoke



Incinerators arrangements at women's hostel

9.3 Noise level

Noise level inside the campus

Sl. No	Location	Max value in dB	Average Value in dB
1	Near Main Entrance	89	59
2	BSc Maths Class room	75	57
3	Library	73	60
4	Vehicle Shed	77	57
5	College Ground	89	67
6	Office	81	62

Noise Level Monitoring



- Diesel Generators (DG) sets do not run on a continuous basis. Only during power failure, DG sets are operated during the working hours of the College.
- Generally Power failure occurs for a very short time period.
- During planned shutdown hours, DGs run continuously based on the load
- Noise disturbance due to DG set is negligible.

10. Audit Findings & Recommendations

Noteworthy activities

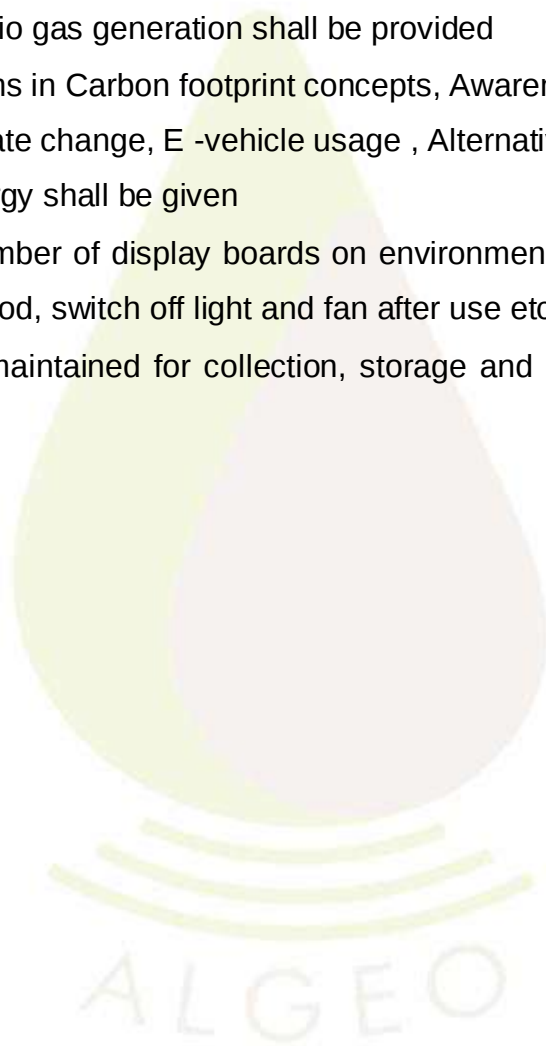
- Clean, Green and plastic free campus
- Excellent Waste management system
- Milk for the hostel mess is brought through milk cans only. No pocket milks
- Biogas generation from Night soil and food waste
- Renewable energy utilisation both thermal and electrical
- Very good exhaust system arrangement at Women's Hostel's incinerator to disperse the smoke and vapours to improve Indoor Air Quality
- Excellent drinking water distribution system throughout the College and Hostels

Findings

- Air pollution impact on Ambient Air quality is negligible since the quantity of fuel used for combustion in the institution is very less
- Noise levels inside the campus are within the prescribed limit.
- Very good initiative is taken by the institution to reduce paper consumption, collection of waste paper and disposal for recycling.
- Lot of initiatives are taken to conserve Water and Energy by the Institution.
- Flow meters are to be provided for better water management
- Total water consumption for Jamal Mohamed College and Hostel –246 KL/Day
- Electrical Energy consumption from TNEB GRID alone –5,69,555 units (Less due to more number of on line classes because of Corona)
- Diesel Generator electrical energy consumption- 3261 units
- Solar Power electrical energy consumption-8750 units
- Total Electrical Energy consumption is 5,81,566 units
- Total Green House Gas Emission is 680.9 t CO₂e
- Green House gas reduction due to renewable energy utilisation and grown up trees is 39.5 t CO₂e
- Net Green House Gas emission is 641.4 t CO₂e

Recommendations

- More Electrical Energy reduction through Solar PV Power Plant Shall be planned
- Flow meter to be installed to know the exact usage of water.
- Flow meter for Bio gas generation shall be provided
- Training programs in Carbon footprint concepts, Awareness on Global warming & Climate change, E -vehicle usage , Alternative Fuel usage , Renewable Energy shall be given
- Increase the number of display boards on environmental awareness such as no wastage of food, switch off light and fan after use etc
- Register to be maintained for collection, storage and disposal of E waste & used batteries



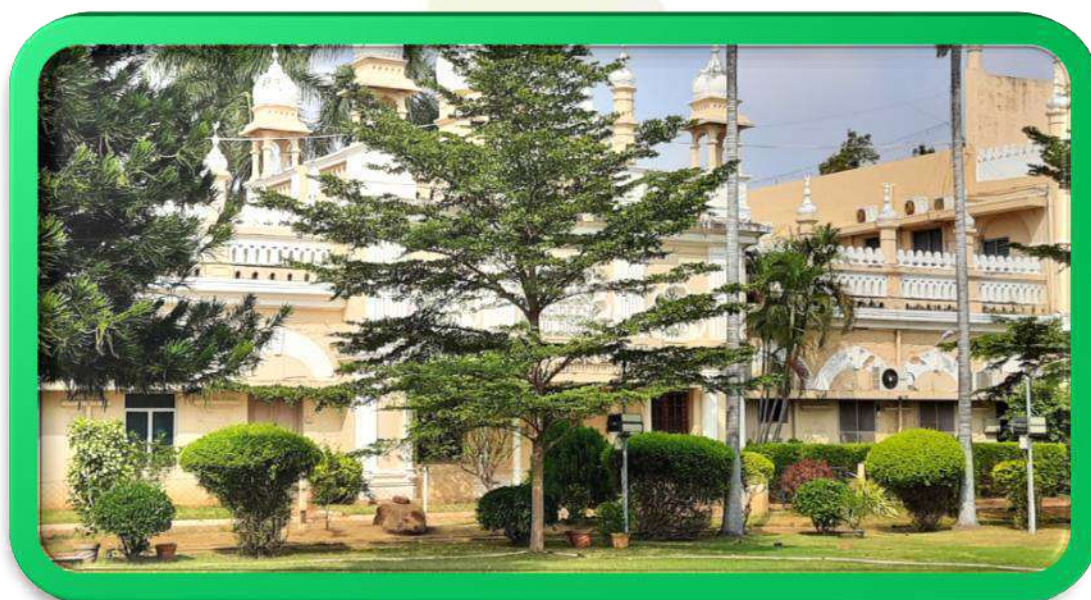
JAMAL MOHAMED COLLEGE (Autonomous)

COLLEGE WITH POTENTIAL FOR EXCELLENCE
Reaccredited (3rd Cycle) with 'A' Grade By NAAC
(Affiliated to Bharathidasan University)

TIRUCHIRAPPALLI – 620020,
TAMILNADU, INDIA.



GREEN AUDIT REPORT 2020-2021



AUDIT / REPORT BY



ALCHEME GREEN ENERGY COMPANY

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ACKNOWLEDGEMENT

We at Alcheme Green Energy Company, Madurai are thankful to the Principal for giving us the opportunity to carry out Green audit of Jamal Mohamed College, Trichy -620 020, Tamilnadu, India. Alcheme Green Energy Company team is also thankful to all other supporting Officers / Staffs of the above institute for their wholehearted support, hospitality and the courtesy extended to the Audit team during the course of the visit.

The following officers from Alcheme Green Energy Company under the guidance of Mr. C. Jebaraj, B.Tech., have carried out the Green Audit.

Name	Qualifications	Certification Number
Mr. C. Jebaraj	B.Tech., PDGEM., DIS., BEE Certificated Energy Auditor, IRCA Certified Lead Auditor - OHSMS Internal Auditor-QMS	EA-9847
Mr. S. Lakshmana Kumaran	B. Tech., MSc.,(Env. Science), MBA., Lead Auditor- Environment	-

The following staff from the Institution participated in the audit process

Name	Designation
Dr. T. Abdul Razak	Coordinator, IQAC
Dr. A. Jafar Ahamed	Associate Professor of Chemistry Core Member, IQAC
Dr.M. Syed Ali Padusha	Associate Professor of Chemistry Coordinator, Khajamian Hostel
Dr. B. Sirajudeen	Associate Professor of Tamil In-Charge, Campus Maintenance
Mr. M. Shaik Mohideen	Electrician – (Training Instructor- Sp. Gr.)

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I. Summary of the Green Audit

Green audit of Jamal Mohamed College and its Hostel was carried by Alcheme Green Energy Company. The green audit reports assist in the process of attaining an eco- friendly approach to the sustainable development of the college. Green audit report is a very powerful and valuable communications tool to use when working with various stakeholders who need to be convinced that things are running smoothly and systems and procedures are coping with natural changes and modifications that occur.

A few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques. This will lead to a prosperous future in context of Green Campus leading to sustainable environment and community development. It has been proved frequently that the practical suggestions, alternatives and observations that have resulted from audits have added positive value to the audited organisation. It is hoped that the results presented in the Green Audit Report will serve as a guide for educating Jamal Mohamed College, on the existing environment related practices and resource usage and spawn new activities and innovative practices.

Noteworthy activities

- Clean , Green and plastic free campus
- Rainwater harvest system to recharge the ground level at various locations
- Excellent waste to wealth management system through Biogas plant using Nightsoil and food waste
- Highly elevated Exhaust duct system installation at the women's hostel to disperse the smoke from incinerators to improve Indoor Air Quality
- Renewable energy utilisation through Solar Power Plant and Solar water Heater

The audit outputs and recommendations are summarised as follows:

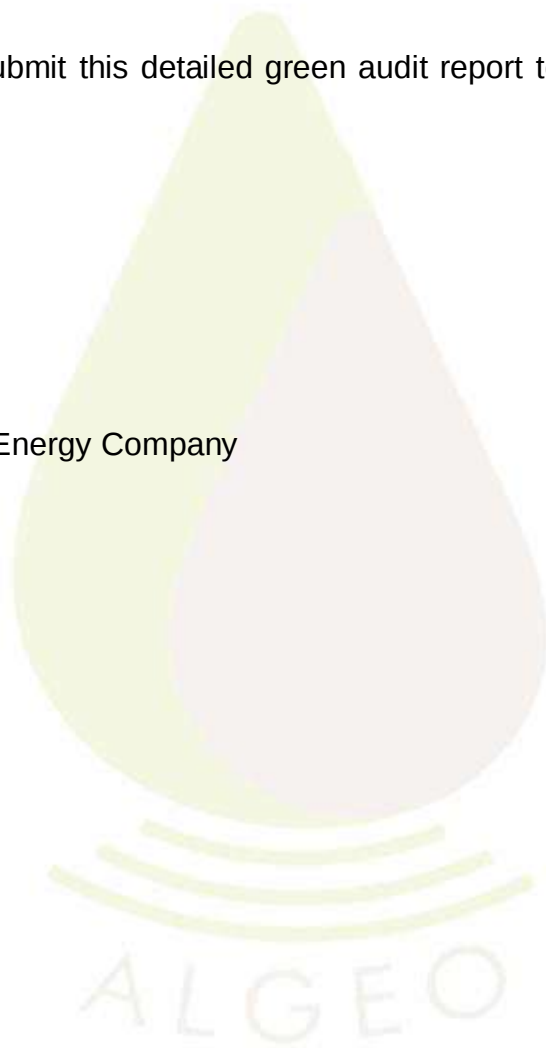
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- Net Green House Gas emission is 641.4 t CO₂ e

We are happy to submit this detailed green audit report to the Jamal Mohamed College



For Alcheme Green Energy Company
Madurai



1.1 Green Policy

Jamal Mohamed College has formulated a Green Policy to guide all its green initiatives. Cleanliness in the campus is maintained through proper disposal of wastes, utilization of eco-friendly supplies and effective recycling program. The concept of eco-friendly culture is disseminated among the students through various seminars/workshops and community-oriented programs. Institution strictly follows reduce, reuse and recycle method to limit energy usages

The main objectives are as follows:

- To ensure that energy and water are used responsibly and conserved
- To develop and maintain environmental management programs to minimize adverse environmental impacts.
- Effective waste management and convert waste to wealth

The Institution vouchsafes:

- Its commitment to sustainability and environmental management
- It reiterates the stand that managing environmental issues is a high priority for the College
- Its commitment to prevent pollution and to continuously improve upon environmental protection.
- A commitment to keeping students and staffs safe from any environmental hazards.

1.2 Total Campus Area & Building Spread Area

- Campus area -**60 Acres**
- Build up area – **2,24,398 Sq. ft.**

1.3 NAAC Grading

- Accredited with 'A' Grade by NAAC

1.4 Campus Infrastructure

Jamal Mohamed College is located in calm and quiet surroundings that are conducive to learning. It helps to stimulate both personal and professional growth of the students. The campus is located about 3 Kms from Trichy Central Bus Stand and Railway Junction.

CLASS ROOMS

Spacious, well ventilated and well-equipped classrooms with projectors and screens facilitate and reinforce effective teaching-learning experience for the faculty and students.

LABORATORIES

Jamal Mohamed College has set up highly advanced science and computer laboratories attached to different departments. These are adequately equipped with the latest gadgets, instruments and apparatus with the aim of providing students conceptual as well as practical understanding of the subject through hands-on training.

LIBRARY

The college has a modern general library with a robust collection of over 216953 volumes of books in 134921 titles on many disciplines covering all major fields of Science, Humanities, and Management. Besides the general library, each department has its own library, containing a major portion of the collection of books. The Library subscribes to about 236 periodicals which include national & international journals, and magazines subscribed by various departments. Many English, Tamil and Malayalam daily newspapers are also subscribed for the enlightenment of both staff and students.

The working methodology of Library such as acquisition of books, circulation control, cataloguing and serials control have been automated using an integrated software. Open access system is implemented in the library.

A modern digital library network with a high speed internet access is also housed in the premises. Reprographic facilities with printer & CD writer are made available for the beneficiaries. Separate sections for Reference Material, Book Bank, Periodicals, and Project Reports are provided for easy access.

DRINKING WATER

Water is not just an ordinary need to the human beings. It plays a vital role in our life hence the institution gives more care towards the provision of safe water to everyone. The college has installed R.O. units in all the possible locations which supply pure and safe drinking water.

INTERNET

College is fully equipped with round the clock internet facility

TRANSPORT

The College provides transport facility for the women students at nominal rates. About 15 college buses help the students to commute to the college from various places in the Tiruchirappalli City.

COMMUNICATION LAB

Communication Training Centre offers the communication classes that offer the flexibility to study. Highly innovative and unique mix of engaging Communication course is accomplished by assessments and interactive sessions that allow the students to progress consistently. Communication training centre provides a Good approach that follows best practices for learning and practicing English Communication.

Adopt a distinct method beyond the classroom, implement an integrated training strategy, sessions are structured to be interactive and participative in a fun and dynamic environment.

Allow students to practice additionally, interactive and regular feedback sessions from trainer, for the advantage to acquire skills faster.

HOSTEL

In the hostel accommodation is provided with quality food from Modular kitchen, RO purified drinking water, 24 x 7 availability of water, Recreation provisions and other amenities. Accommodation is available for undergraduate and postgraduate students. The hostels provide a calm and relaxing atmosphere to accelerate the creative talents of the students. The teachers who act as resident wardens of the hostels provide moral and emotional support and guidance to the inmates. The hostel securities ensure 24 hours safety.

The KHAJAMIAN HOSTEL (FOR MEN)

The Khajamian Hostel is one of the biggest hostels in Tamilnadu . The hostel has 9 blocks and can accommodate about 2200 students

The Khajamian Hostel gives an opportunity to the students of downtrodden families, a chance to Earn while Learn with free boarding and Lodging facilities and also monthly honorarium is given.

The Premier Rooms are available for the inmates to occupy AC or Non AC rooms and students can opt for Premier Mess / Normal Mess.

A separate wing called Mosque Hostel (Rent Free) is available for the economically poor and meritorious wards of Imam and Muadinar

Sports Hostel cares for both body and mind of the Sports persons separately with nourishing food items to equip their sporting skills.

THE WOMEN HOSTEL

The College is running an exclusive hostel for women students which is situated inside the college premises with all infrastructure facilities

The amenities like Visitors' Room, Library, Reading Room, Clinic, Cafeteria, Ironing Room, Television Room, Prayer Hall, Auditorium, Multipurpose Hall, Guest House, Internet Browsing Centre, Play Ground, Canteen, Generators and Public Address System are available in the hostel premises, to facilitate the inmates and stake holders

-
-

2. Pre-Audit Stage

A pre-audit meeting provided an opportunity to reinforce the scope and objectives of the audit and discussions were held on the practicalities associated with the audit. This meeting is an important prerequisite for the green audit because it is the first opportunity to meet the auditee and deal with any concerns.

The meeting was an opportunity to gather information that the audit team can study before arriving on the site. The audit protocol and audit plan was handed over at this meeting and discussed in advance the audit itself.

In Jamal Mohamed College pre-audit meeting was conducted successfully and necessary documents were collected directly from the College before the initiation of the audit processes. Actual planning of audit processes was discussed in the pre-audit meeting. Audit team was also selected in this meeting with the help of staff and the college management.

The audit protocol and audit plan were handed over at this meeting and discussed in advance of the audit itself. The audit team worked together, under the leadership of the lead auditor, to ensure completion within the brief and scope of the audit.

2.1 Management's Commitment

The Management of the college has shown the commitment towards the green auditing during the pre-audit meeting. They were ready to encourage all green activities. It was decided to promote all activities that are environment friendly and planting more trees on the campus etc., after the green auditing.

2.2 Scope and Goals of Green Auditing

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues.

Green Audit is the most efficient and ecological way to manage environmental problems. It is a kind of professional care which is the responsibility of each individual who are the part of economic, financial, social, environmental factor. It is necessary to conduct green audit in the College campus because students become aware of the green audit, its advantages to save the planet and they become good citizens of our country.

A very simple indigenized system has been devised to monitor the environmental performance of Jamal Mohamed College, Trichy. It comes with a series of questions to be answered. This innovative scheme is user friendly. The aim of this is to help the Institution to set environmental examples for the community and to educate the young learners.

2.3 Benefits of the Green Auditing

- More efficient resource management
- To create a green campus
- To enable waste management through reduction of waste generation, solid-waste and water recycling
- To create plastic free campus and evolve health consciousness among the stakeholders
- Recognize the cost saving methods through waste minimizing and management
- Point out the prevailing and forthcoming complications
- Authenticate conformity with the implemented laws
- Empower the organizations to frame a better environmental performance
- Enhance the alertness for environmental guidelines and duties
- Impart environmental education through systematic environmental management approach and Improving environmental standards
- Benchmarking for environmental protection initiatives
- Financial savings through a reduction in resource use
- Development of ownership, personal and social responsibility for the College and its environment
- Developing an environmental ethic and value systems in youngsters.
- Green auditing should become a valuable tool in the management and monitoring of environmental and sustainable development programs of the college.

2.4 Target Areas of Green Auditing

Green audit forms part of a resource management process. Although they are individual events, the real value of green audits is the fact that they are carried out, at defined intervals and their results can illustrate the improvement.

Eco-campus concept mainly focuses on the efficient use of energy and water; minimize waste generation or pollution and also economic efficiency. All these indicators are assessed in process of “Green Auditing of educational institute”. Eco-campus focuses on the reduction of contribution to emissions, procure a cost effective and secure supply of energy, encourage and enhance energy use conservation, reduce the institute’s energy and water consumption, reduce wastes to landfill and integrate environmental considerations into all contracts and services considered to have significant environmental impacts. Target areas included in this green auditing are water, energy, waste, green campus and carbon footprint.

Auditing for Water Management

Water is a natural resource; all living matters depend on water. While freely available in many natural environments, in human settlements potable (drinkable) water is less readily available. We need to use water wisely to ensure that drinkable water is available for all, now and in future. Aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible Institution should examine its water use practices.

Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water. It is therefore essential that any environmentally responsible Institution examine its water use practices.

Auditing for Energy Management

Energy cannot be seen, but we know it is there because we can see its effects in the forms of heat, light and power. This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment. An old incandescent bulb uses approximately 60 W while an energy efficient light emitting diode (LED) uses only less than 10 W. Energy auditing deals with the conservation and methods to reduce its consumption related to environmental degradation. It is therefore essential that any environmentally responsible institution examine its energy use practices.

Auditing for Waste Management

Pollution from waste is aesthetically unpleasing and results in large amounts of litter in our communities which can cause health problems. This indicator addresses waste production and disposal of plastic waste, paper waste, food waste, and recycling.

Solid waste can be divided into two categories: general waste and hazardous waste. General wastes include what is usually thrown away in homes and schools such as garbage, paper, tins and glass bottles. Hazardous waste is waste that is likely to be a threat to health or the environment like cleaning chemicals and used oils.

Unscientific landfills may contain harmful contaminants that leach into soil and water supplies, and produce greenhouse gases contributing to global climate change. Furthermore, solid waste often includes wasted material resources that could otherwise be channelled into better service through recycling, repair, and reuse. Thus the minimization of solid waste is essential to a sustainable college. It is therefore essential that any environmentally responsible institution examine its waste processing practices.

Auditing for Green Campus Management

Unfortunately, biodiversity is facing serious threats from habitat loss, pollution, over consumption and invasive species. Species are disappearing at an alarming rate and each loss affects nature's balance and our quality of life. Without this variability in the living world, ecological systems and functions would break down, with detrimental consequences for all forms of life, including human beings.

Newly planted and existing trees decrease the amount of carbon dioxide in the atmosphere. Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. The amount of oxygen that a single tree produces is enough to provide one day's supply of oxygen for people. So while the students are busy studying and working on earning those good grades, all the trees on campus are also working hard to make the air cleaner.

Trees on our campus impact our mental health as well; studies have shown that trees greatly reduce stress, which the students feel.

Auditing for Carbon Footprint

Commutation of stakeholders has an impact on the environment through the emission of greenhouse gases into the atmosphere consequent to burning of fossil fuels (such as petrol). The most common greenhouse gases are carbon dioxide, water vapour, methane, nitrous oxide and ozone. Of all the greenhouse gases, carbon dioxide is the most prominent greenhouse gas, comprising around 415 ppm of the Earth's atmosphere. The release of carbon dioxide gas into the Earth's atmosphere through human activities is commonly known as carbon emissions.

An important aspect of doing an audit is to be able to measure your impact so that we can determine better ways to manage the impact. In addition to the water, waste, energy and biodiversity audits we can also determine what our carbon footprint is, based on the amount of carbon emissions created. One aspect is to consider the distance and method travelled between home and college every day. It undertakes the measure of bulk of carbon dioxide equivalents exhaled by the organization through which the carbon accounting is done. It is necessary to know how much the organization is contributing towards sustainable development. It is therefore essential that any environmentally responsible institution examine its carbon footprint.

3. Audit Stage

In Jamal Mohamed College green auditing was done with the help of Alcheme Green Energy Company involving different student groups, teaching and non-teaching staff. The green audit began with the teams walking through all the different facilities at the college, determining the different types of appliances and utilities as well as measuring the usage per item and identifying the relevant consumption patterns and their impacts.

The staff and learners were interviewed to get details of usage, frequency or general characteristics of certain appliances. Data collection was done in the sectors such as Energy, Waste, Greening, Carbon footprint and Water use. College records and documents were verified to clarify the data received through survey and discussions.

3.1 Student Clubs and Forums Involved

- ECO Club, National Service Scheme(NSS)

3.2 Comments on Site Tour

Site inspection was done along with students and staff. Questionnaires were answered during the site tour. Students and staff took much interest in the data collection processes. It was quite interesting and fascinating. It was an environmental awareness program for the students who participated in the green auditing. The experience of green auditing was totally a new experience for most of the students. They have shared their expectations about a green campus and gave suggestions for the audit recommendations.

3.3 Review of Documents and Records

Documents such as electricity and water charge remittance, laboratory equipment registers, audited statements and office registers were examined and data were collected. College calendars, college magazines, annual report of the college and NAAC self-assessment reports, UGC report etc. were also verified as a part of data collection.

3.4 Review of Policies

Discussions were made with the College management regarding their policies on environmental management. Future plans of the college were also discussed. The management would formulate an environment /green policy for the college in the light of green auditing. The purpose of the green audit was to ensure that the

practices followed in the campus are in accordance with the Green Policy adopted by the Institution.

3.5 Interviews

In order to collect information for green auditing different audit groups interviewed teaching and non-teaching staff, students and other stakeholders of the college.

3.6 Site inspection

College and its premises were visited and analysed by the audit-teams several times to gather information. Campus trees were counted and identified. Medicinal /Herbal plants garden, play grounds, canteen, library, office rooms and parking grounds were also visited to collect data. Number and type of vehicles used by the stakeholders were counted. Number of LPG cylinders used in labs, canteen and hostel kitchen were also counted.



4. Post Audit Stage

The base of any green audit is that its findings are supported by documents and verifiable information. The audit process seeks, on a sampled basis, to track past actions, activities, events, and procedures to ensure that they are carried out according to systems requirements and in the correct manner.

Green audits form a part of a process. Although they are individual events, the real value of green audits is the fact that they are carried out, at defined intervals, and their results can illustrate improvement or change over time. Although green audits are carried out using policies, procedures, documented systems and objectives as a test, there is always an element of subjectivity in an audit.

The essence of any green audit is to find out how well the environmental organisation, environmental management and environmental equipment are performing. Each of the three components is crucial in ensuring that the organisation's environmental performance meets the goals set in its green policy. The individual functioning and the success of integration will all play a role in the degree of success or failure of the organisation's environmental performance.

4.1 Key Findings, Observations and Evaluations

a) Water Usage at Jamal Mohamed College

Total number of students studied during the academic year 2020-2021: 12,225

Teaching & non-Teaching staff in the institution during the academic year 2020-2021: 774

Total number of stake holders: 12,999

Water for college and hostel

Corporation water through Tanker Lorry for college - 6,000 litres/day

Corporation water through Tanker Lorry for Men's Hostel - 72,000 litres/day

Corporation water through Tanker Lorry for Women's Hostel - 60,000 litres/day

Borewell water for Hostel and college – 1,08,000 litres/day

Total water usage -2,46,000 litres/day

Main water uses in the College campus are Drinking, Rest broom, Canteen and Lab

Water usage in the College- 92 KL / Day

Water usage per day per stakeholder in the college – 7.52 litres

Water usage at College

Sl. No	Place	Water usage Quantity Litres / Day
1	Drinking	13,000
2	Rest room	48,000
3	Canteen	13,000
4	Lab	8,000
5	Garden	9,000
6	Construction	1,000
	Total	92,000

Waste water generation in the college – 69 KL/day

Water usage at Hostels

Number of students and staff residing in the hostel in the year 2020-2021: 1896

Main water uses in the Hostel are Drinking, Washing of clothes, Cooking & Vessel cleaning and for Rest room

Water usage at Hostels (Men and Women) - 154 KL / Day

Water consumption per day per stakeholder in the hostel – 81.2 litres

Water usage at Hostel(Men and Women)

Sl. No	Place	Water usage Quantity Litres / Day
1	Drinking	4000
2	Cooking	4000
3	Rest room	42,000
4	Bathing	40,000
5	Clothes washing	52,000
6	Vessel Cleaning	12,000
	Total	154,000

Waste water generation in the Hostels – 146 KL /day

For drinking water: RO water system of both industrial and commercial type were installed in college and hostels.



In addition to industrial RO plants, small size domestic models of RO units are installed in all the floors of all Blocks to cater the needs of drinking water inside the college campus

- Analysis of Drinking water and bore well water samples are done periodically
- The quality of Drinking water is within the norms.
- Microbial test for Drinking water is carried out on periodical manner.

Rainwater Harvesting

At Jamal Mohamed College, rainwater harvesting is done effectively to enhance the ground water level. The institution has rainwater harvesting pits at various locations and they are being maintained properly. The water drained during the rainy season is allowed to flow into the pits constructed in various places inside the campus including the Hostel Premises.

Rainwater recharge pit- 53 Numbers





RAINWATER HARVEST PITS

Rainwater collection sumps-3 Numbers

Rain water Storing sump in Department of Chemistry:

This Rain water utilized by the **Chemistry Laboratory Since 2005.**

Capacity of the tank: 25.65KL

Size: 15x10

Since the rainwater is similar to distilled water which is utilized by students throughout the year

Rain water collection sump in front of chemistry department



Water Conservation initiatives

- Level controller are provided to reduce the wastage of water
- Industrial type RO Plant water rejects are used for garden
- Periodical preventive maintenance are carried out to avoid leakages

Water Level Controllers



b)Energy

Total Conventional Electrical Energy Consumption details

	Electrical Energy Consumption - TNEB and DG	
	TNEB-College	units
1	HT service	125230
2	LT service	237498
	TNEB-Hostel	
1	Men's Hostel	152307
2	Women's Hostel	54520
	DG Set	
1	Both College and Hostel	3261
	Total	572816

Renewable Electrical Energy-Solar Electrical energy Consumption

Installed capacity -50KW

Energy Generation from installation-1,29,449 units

Energy Generation during the year 2020-2021-8750 units only

(Less utilisation due to more online classes because of Corona)



Conventional Thermal Energy consumption - LPG

- LPG cylinders used- commercial cylinders of 19 kgs capacity
- Total LPG consumption during the year 2020-2021- 6194 Kgs

Conventional Thermal Energy consumption- Diesel

Diesel Consumption for transport during the year 2020-2021 – 1162 Litres

Renewable Thermal Energy-Solar Water Heater

Solar Water Heater installed-1000 LPD- one

500 LPD- Four

Total Capacity-3000 LPD



Renewable Thermal Energy- Biogas

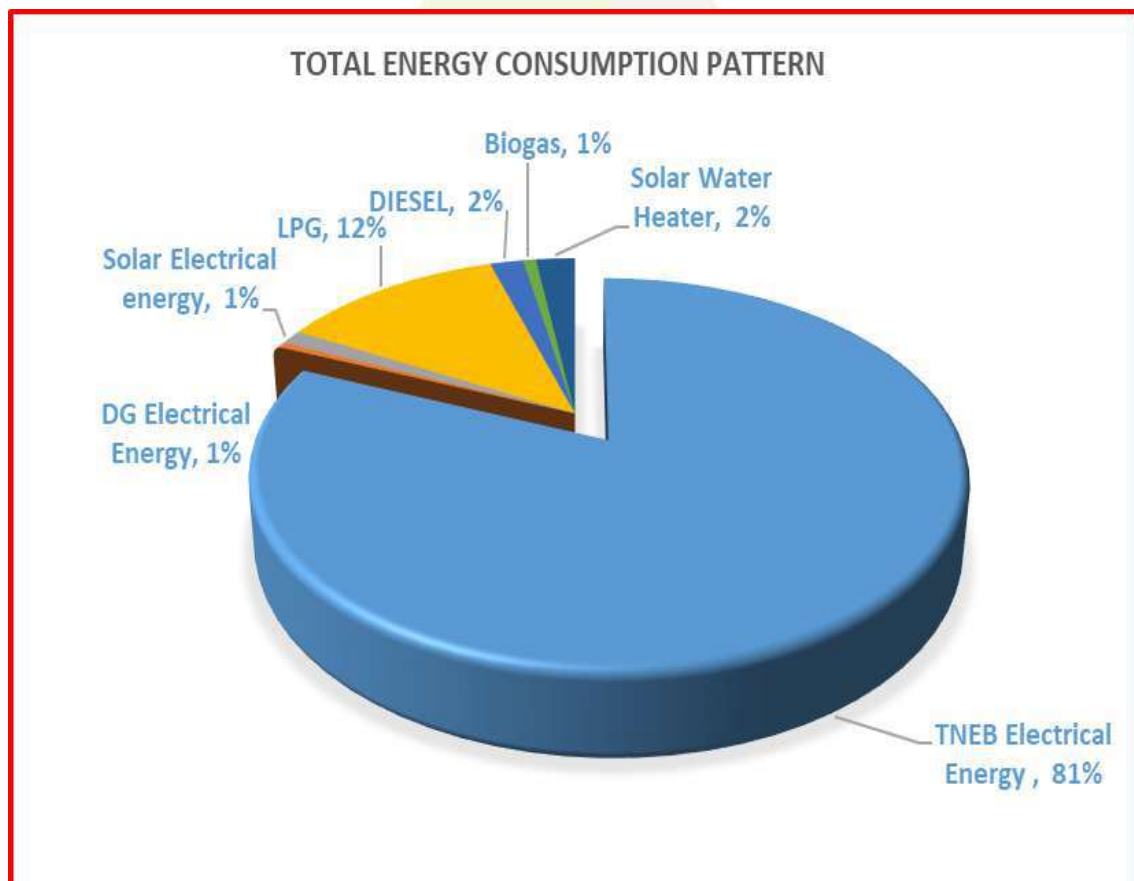
Biogas plants installed- 25 M3 capacity X 2(Each one at Men & Women Hostel)
35 M3 capacity X 1(Men Hostel)



15.Total Energy consumption

Electrical (Conventional & Renewable) and Thermal(Conventional & Renewable)

SL.NO	TYPE OF ENERGY	ENERGY -GCAL	Percentage
1	TNEB Electrical Energy	489.82	81.41
2	DG Electrical Energy	2.80	0.47
3	Solar Electrical energy	7.53	1.25
3	LPG	73.71	12.25
4	DIESEL	10.87	1.81
5	Biogas	4.20	0.70
6	Solar Water Heater	12.77	2.12
	Total	601.7	100.00



The energy conservation measures followed

- Auto Level controller is provided in all water storage tanks to avoid overflow of water and to save energy
- Replacing conventional electrical light fittings with energy efficient Light-Emitting Diode (LED) bulbs is going on as continuous process
- Maximum utilisation of day lights at the hostel and colleges
- Staff and Students are made aware of using public transport and college buses and individual vehicle usage is being reduced
- Periodical maintenance and overhauling of generators is being carried out
- Periodical maintenance of UPS and Battery systems are carried out.
- The fans, lights, air-conditioners and other electronic and electrical equipments are switched off when not in use.
- Computers are switched to sleep mode or hibernate mode automatically when not in use.
- At the end of every practical session, Computer monitors and UPS are switched off.
- Soft copies are maintained instead of hard copies, to reduce power consumption and paper.
- Work supervisor and electrician regularly check the usage of lights, fans and all other energy sources during and out of the college hours.
- Lights and fans are switched off by the students whenever they are out of hostel rooms

c) WASTE

Quantity of waste generated:-

- Waste water generation in the College - 69 KL /day
- Waste water generation in the girls Hostel – 146 KL /day
- Boys hostel – 66 KL / day

College

- Biodegradable—<5 kg/day

Office

- Non-biodegradable —< 0.5kg/day

College Canteen

- Biodegradable —< 15 kg / day
- Non-biodegradable —<0.5kg / day
- Aluminium foil —<0.1kg / day

Hostel

- Biodegradable(Food waste) - 100-300 kg / day
- Non-biodegradable – <0.5kg / day

Open area

- Biodegradable (Dry leaves)- 10-20 kg / day

Plastic waste

- Less than 1000 grams / day

e-Waste

- Less than 200 kgs / year

Waste Management

Liquid waste Management

- The night soil produced by the hostels are directed to a total of three biogas plants from which fuel gas(Biogas) is produced. The gas is used in the mess kitchen at an average of 12 Kg methane per day on normal college working days
- College has a large mechanical filtering system to process grey water
The grey water produced is used to irrigate the coconut farm situated behind the hostel. The grey water produced is first processed is mechanically filtered and pumped out to the coconut farm. Due to long term use, the nitrate content in grey water is increasing due to usage of detergents. For this purpose, the

mechanically filtered grey water discharge is passed through a stagnation filter assisted by live herbaceous plants that are capable of absorbing and accumulating nitrogenous wastes. For this purpose, four stagnation filter units have been constructed

- RO plant reject from industrial type is used for gardening purpose.

Bio-degradable waste management

- ❖ Bio-Degradable and non-biodegradable waste are collected in separate bins provided. ,
- ❖ Compost pit has been constructed to decompose kitchen waste by employing enriched microbial culture as well as vermicompost method
- ❖ Dry leaves are collected separately, dumped in the pits and converted into Bio fertilizer and used as bio fertiliser
- ❖ The egg shell waste are separately dried and powdered in grinder and used as an additive in compost produce. This mixture is used as manure for organic recovery plot, where vegetable are grown without chemical fertilizers.

Plastic Waste Management

- The college has been declared as a 'Plastic Free' zone.
- Milk for the hostel mess is brought through milk cans only. No pocket milks
- Use of polythene bags, plastic cubs and laminated papers are prohibited
- Students and staff are advised to bring cloth bags
- All the stake holders are motivated to use stainless steel water bottles and lunch boxes.
- Plastic utensils in the stores, canteen and hostel kitchen are replaced with stainless steel plates, tumblers etc
- Plastic waste that comes in through lab equipment's package, empty chemical containers etc. are collected separately and disposed periodically for recycling.

Used Battery Management

- Used batteries are disposed through Buy back method

e-Waste Management

- All electronic machineries are purchased under Buy-Back agreement for proper disposal of e waste to recycler

Other Solid Waste Management

- Egg cells are collected separately and used for calcium enrichment
- Solid wastes generated from damaged furniture are sent to waste wood collection centre. Useful furniture and other wooden materials are made from the waste
- Glass wastes are disposed periodically through municipal waste collection system.

Waste Reduction

- ❖ Students are instructed not to waste paper while writing examinations.
- ❖ Reusing one side paper
- ❖ Where ever possible, printing on both sides of papers
- ❖ In order to reduce the use of paper the following initiative were taken by E - Governance
 - Attendance
 - Payment of fees
 - Submission of e-assignment through email
 - Digitalisation of Staff profiles and details about students
 - E – Circular through SMS, WhatsApp or Email
- Online Admission Process – Printing of applications reduced & submission of applications through admission portal.
- All inter department communications are through intranet
- Online exams are conducted to reduce the paper usage.

Waste Recycling

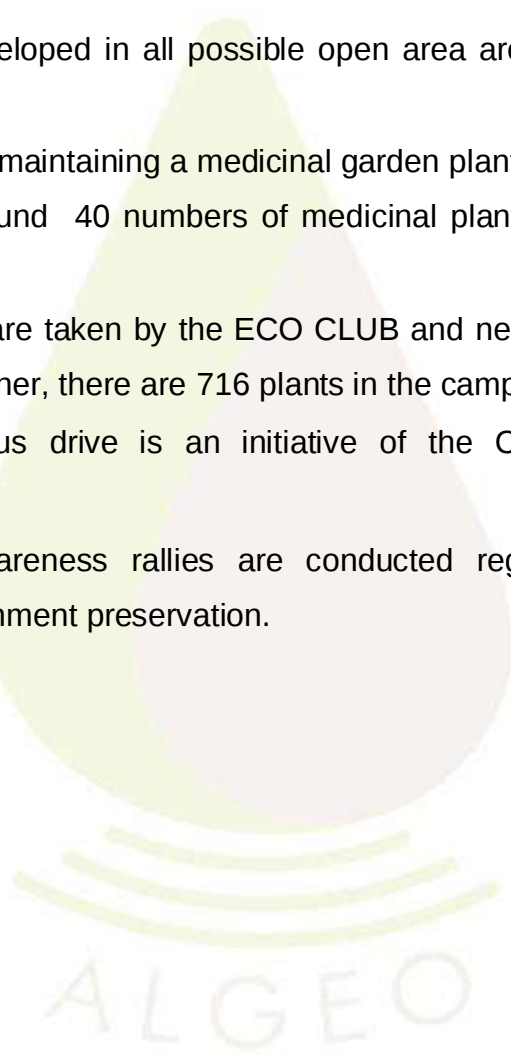
Recyclable papers are collected and kept and disposed as mixed waste to paper mills through authorized Vendors.

- The answer scripts after the publication of results are sent for recycling.
- e wastes are collected and sent to authorised recycler.

d) Green Campus

Jamal Mohamed College, Trichy being located in the regime surrounded by agriculture based villages, naturally the institute is overwhelmed with the atmosphere of greenery. The Institution too does ever take meticulous efforts to maintain and retain the Nature given atmosphere with planting of new saplings The campus is lush green with gardens, lawns and plants wherever there is open space

- The eco-friendly ambience of the campus is a noteworthy feature of Jamal Mohamed College
- Green belt is developed in all possible open area are being converted into greenery
- The ECO CLUB is maintaining a medicinal garden plants which is spread over 300 sqft area. Around 40 numbers of medicinal plants are there inside the campus
- Special initiatives are taken by the ECO CLUB and new saplings are planted every year. Altogether, there are 716 plants in the campus.
- The Green campus drive is an initiative of the College to protect the environment.
- Environmental awareness rallies are conducted regularly to spread the message of environment preservation.



Hostel Campus Tree Details (2021-22)

Sl No	Tree Name in Tamil	Tree Name in English	Quantity
1	வேப்ப மரம்	Neem Tree	121
2	தென்னை மரம்	Coconut Tree	280
3	புளிய மரம்	Tamarind Tree	3
4	பாதாம் மரம்	Almond Tree	12
5	பாக்கு மரம்	Beetlenut Tree	6
6	தேக்கு மரம்	Teakwood Tree	18
7	வாகை மரம்	Substitute Tree	13
8	சிகப்பு அரளி மரம்	Red	7
9	நெல்லிக்காய் மரம்	Gooseberry Tree	2
10	மாமரம்	Mango Tree	18
11	எலுமிச்சை மரம்	Lemon Tree	2
12	அரச மரம்	Peepul Tree	1
13	பப்பாளி மரம்	Papaya Tree	1
14	நெட்டிலின் மரம்	Ashoka Tree	28
15	புங்க மரம்	Punga maram	6
16	முந்திரி மரம்	Cashew Tree	4
17	காக்கரட்டான் மரம்	Cactus Tree	1

Sl No	Tree Name in Tamil	Tree Name in English	Quantity
18	ஆவி மரம்	Spirit Tree	1
19	கொடுக்காப்பள்ளி மரம்		1
20	வாதமோடக்கி மரம்		3
21	மூங்கில் மரம்	Bamboo Tree	1
22	கொய்யா மரம்	Guava Tree	7
23	முருங்கை மரம்	Drumstick Tree	10 67
24	இளவம்பஞ்சு மரம்	Cotton Tree	1
25	நொனா மரம்	Nuna Tree	17
26	எழந்த மரம்	Locust Tree	1

27) No of Trees in PANH - 94

GREEN BELT DEVELOPMENT



e) Carbon Footprint

Release of carbon dioxide into the atmosphere is contributes to the global warming and increasing the pace of climate change. More trees outside the campus will make a source of sink for the carbon dioxide and for other greenhouse gases.

Due to Corona , college has conducted only 79 physical classes

Electrical energy consumption, Diesel and petrol consumption are very less in the year 2020-2021 compare to normal academic years

• No of students and staff stayed in the hostel	1896
• Diesel consumption by college buses	1162 L
• Diesel consumption by DG in the hostel & college	1087 L
• Total Diesel Consumption	2249 L
• Radius of Trichy city	14 KM
• Average distance travelled by staff and students per day	28 Km
• No of Four wheelers being used by students and staff	51
• No of Two wheelers being used by students and staff	2021
• Average Fuel efficiency of four wheelers –	20 Km/ L
• Average Fuel efficiency of Two Wheelers -	60 Km/ L
• Average Petrol consumption by four wheelers-	5640 L
• Average Petrol consumption by two wheelers-	74508 L
• Total Petrol consumption-	80148 L
• Total LPG consumption(Hostel & canteen) per year -	6194 Kgs
• Total electrical power consumed from Grid-	5,69,555 units

Green House Gas -Emission

• Green House Gas emission due to diesel	6004.8 Kg CO ₂ e
• Green House Gas emission due to petrol	189149.6 Kg CO ₂ e
• Green House Gas emission due to LPG	18767.8 Kg CO ₂ e
• Green House Gas emission due to Grid power	467035.1 Kg CO ₂ e
• Total GHG emission	680957.3 Kg CO ₂ e 680.9 t CO ₂ e

Green House Gas-Reduction

• Total Solar power generation -	8750 units
• Total capacity of solar water heater installed -	3,000 LPD
• Biogas generation-	1051Kgs
• No of fully grown up tress	716
• Green House Gas reduction due to solar power plant	6.1 t CO ₂ e
• Green House Gas reduction due to solar water heater	10.4 t CO ₂ e
• Green House Gas emission due to biogas generation	1.5 t CO ₂ e
• Green House Gas offset by tress	21.5 t CO ₂ e
• Total Green House gas reduction -	39.5 t CO ₂ e
• Net Green House Gas emission-	(680.9.- 39. 5) 641.4 t CO ₂ e

4.2 Consolidation of Audit Findings

We hope that students would have developed a greater appreciation and understanding of the impact of their actions on the environment. They have successfully been able to determine the impacts on the environment through the various auditing exercises. Participating in this green auditing procedure they have gained knowledge about the need of sustainability of the college campus. It will create awareness on the use of the Earth's resources in their home, college, local community and beyond.

General

- Green Policy is stated and objectives are reflected very well in the functioning of the College and Hostel
- Gardens inside the college premises are found to be well maintained.
- Campus is declared plastic free and lot of initiatives and innovative actions are taken to maintain the green policy.

Water

- Total water consumption -246 KL/day
- Excellent Water Management & Waste Water Management .

Water Conservation

- Level controllers are provided to all water storage tanks to avoid overflow
- Periodical Maintenance of water taps are carried out to avoid leakages

Rain water Harvest system

- Appreciable work has been carried out for harvesting the rainwater both from college buildings & hostel for charging the ground water level and usage.

Energy

- Total electrical energy consumption from TNEB Grid alone is 5,69,555 units
- Lot of Energy saving activities are implemented
- More number of conventional tube lights are replaced with LED lights
- 50KW Solar plant installation is highly appreciable.
- 3000 LPD Solar water heater to supply hot water to students are good
- Biogas is generated from Nightsoil and food waste and used it at Kitchen

Waste to Wealth

- From night soil and Food waste biogas is generated and used in the kitchen
- 1 X 35 and 2 X 25 M³ Biogas plant is functioning well

Waste Recycle

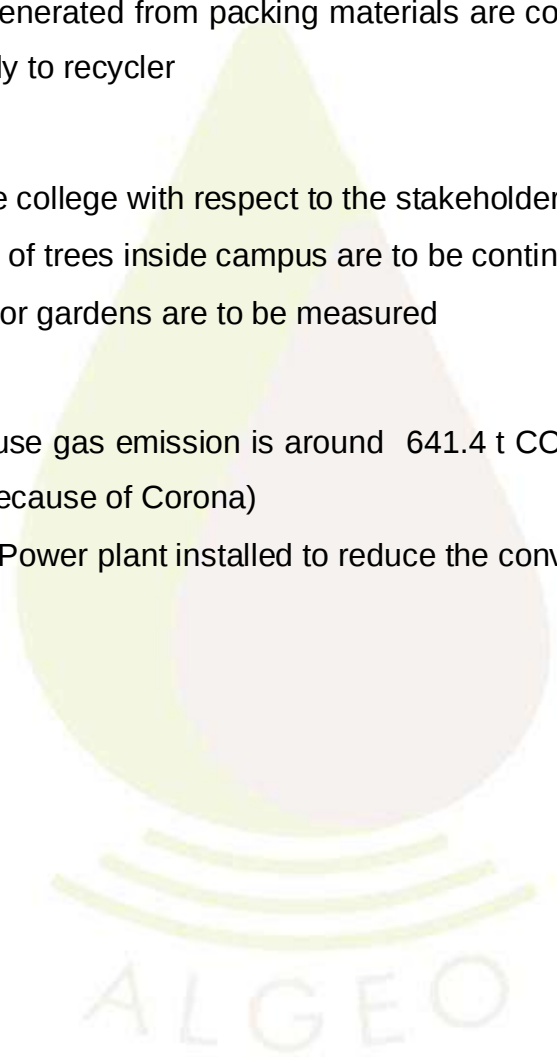
- Paper wastes are collected in a proper manner and sent for recycling
- E - wastes are collected and kept separately to send to authorised recycler
- Plastic wastes generated from packing materials are collected separately and disposed properly to recycler

Green Campus

- Tree cover of the college with respect to the stakeholder strength is excellent
- Regular planting of trees inside campus are to be continued
- Usage of water for gardens are to be measured

Carbon Foot Print

- Yearly Greenhouse gas emission is around 641.4 t CO₂e (Less due to More online classes because of Corona)
- 50KW Solar PV Power plant installed to reduce the conventional EB power



4.3 Preparation of Action Plan

Policies referring to college's management and approach towards the use of resources need to be considered. The college green policy/environmental policy for its sustainable development to be monitored consciously.

4.4 Follow-up Action and Plans

Green Audits are exercises which generate considerable quantities of valuable management information. The time, effort and cost involved in this exercise is often considerable and in order to be able to justify this expenditure, it is important to ensure that the findings and recommendations of the audit are considered at the correct level within the organisation and that action plans and implementation programs result from the findings. Audit follow up is part of the wider process of continuous improvement.

4.5 Environmental Education

The following environmental education program may be implemented in the college before the next green auditing:-

- Training programs in Water & Waste management , Solids and e-Waste Management, Carbon footprint concepts, Awareness on Global warming
- Increase the number of display boards on environmental awareness such as no wastage of food/water, switch off light and fan after use, plastic free campus etc.

Awareness on Carbon Emission

- Students and Staff members are made totally aware of pollution caused by use of vehicles.
- The awareness programs on carbon emission at individual as well as social level will help to avoid air and noise pollution due to vehicles.

4.6 Recommendations

Common Recommendations

- Targets for Green policy shall be fixed

Criteria Wise Recommendations

Water

- Water consumption monitoring system has to be implemented in the college campus and hostel
- Water Flow meter to be introduced to measure the quantity of water used
- More awareness programs on water conservation to be conducted.
- More display on water conservation shall be displayed

Energy

- Gas Flow meter to be introduced to assess the quantity of Bio gas produced
- Target for more percentage of Renewable Energy contribution
- Remaining old Tube lights shall be replaced with LED tube lights.
- Conventional fans shall be replaced with BLDC fan
- Conduct more awareness programs on importance of energy saving for students and staff
- More display on energy conservation shall be displayed
- Five star rated energy efficient ACs to be procured in the future

Waste

- Conduct exhibition of recyclable waste products
- Every six months e-waste to be disposed as per e-waste Management rules 2016.
- Register to be maintained for collection, storage and disposal of E waste & used batteries
- Biodiesel project shall be given to students from used cooking oil

Green Campus

- Keep continuously encouraging students for making the campus green
- Roof garden for hostel building shall be planned in future
- Maintenance of Green house building to be improved
- Training/awareness on Global warming, Climate Change shall be given to students

Carbon footprint

- Fix a target to reduce Green House Gas emission
- Present Net Green House gas emission per year is 641.4 t CO₂ e (Less due to more on line classes)
- Aim for Net Zero emission from the institution in the coming years
- Green building approach for one building shall be planned in the future
- E vehicle shall be planned in the future for transport
- Car-pooling shall be encouraged among the staff
- Training/ awareness on Carbon foot print concepts to be given to students and staffs





JAMAL MOHAMED COLLEGE (AUTONOMOUS)

(Affiliated to Bharathidasan University)

TIRUCHIRAPPALLI - 620 020

NAAC - SSR IV CYCLE

Criterion VII-Institutional Values and Best Practices

7.1 Institutional Values and Social Responsibilities

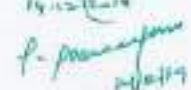
7.1.6 Quality audits on environment and energy are regularly undertaken by the institution

2019-2020 Green Audit

MANAGING COMMITTEE											
GREEN AUDIT											
at Jamal Mohamed College Campus for the year 2019 - 2020											
The members of the Green Audit Committee inspected the premises of the College at 12.00 Noon on 14.12.2019. The following observations have been made with regard to the audit and a few suggestions were also given to make the campus more eco and user friendly.											
Members Present			Date: 14.12.2019								
S.No.	Name	Designation	Signature								
1.	Dr. R. RADU RAJENDRAN	Professor, Dept. of Env. Biotechnology Bharathidasan University, Tiruchirappalli - 620 024									
2.	Dr. R. THAJUDIN	Dean, Faculty of Science, Engineering and Technology and Professor, Dept. of Microbiology Bharathidasan University, Tiruchirappalli - 620 024 Mobile No: 9942319718									
3.	Mr. S.P. MOHAN	Former President, Tamil Nadu Youth Easam 5, Saku Road Est., Thillai Nagar, Tidaly-18 Mobile No: 9894487572									
4.	Mr. P. PONNUSEKARAN	Nice Medical Supervisor, Dept. of Public Health & Preventive Medicine, Townmaster Block, Tiruchy No.26, Causway Nagar North Extension Winnias Road, Airport Tiruchy- 620 007. Mobile No: 9791381082									
Previous Recommendation of the Green Audit Committee held on 08.12.2018, were implemented as detailed below:											
1. The Expenditure incurred on green initiatives and waste management during the year 2016-2017 to 2018-2019 is given below:											
The Expenditure incurred was <table border="1"> <thead> <tr> <th>Year</th> <th>Rs.</th> </tr> </thead> <tbody> <tr> <td>2016-2017</td> <td>4,97,783.00</td> </tr> <tr> <td>2017-2018</td> <td>12,58,273.00</td> </tr> <tr> <td>2018-2019</td> <td>11,30,605.00</td> </tr> </tbody> </table>				Year	Rs.	2016-2017	4,97,783.00	2017-2018	12,58,273.00	2018-2019	11,30,605.00
Year	Rs.										
2016-2017	4,97,783.00										
2017-2018	12,58,273.00										
2018-2019	11,30,605.00										
2. Under renewable sources of energy such as Solar Lighting and LED facilities, the following details for utilization of funds from the years 2016-2017 to 2018-2019 are given below:											
The fund utilized was <table border="1"> <thead> <tr> <th>Year</th> <th>Rs.</th> </tr> </thead> <tbody> <tr> <td>2016-2017</td> <td>1,79,628.00</td> </tr> <tr> <td>2017-2018</td> <td>3,48,833.00</td> </tr> <tr> <td>2018-2019</td> <td>1,19,530.00</td> </tr> </tbody> </table>				Year	Rs.	2016-2017	1,79,628.00	2017-2018	3,48,833.00	2018-2019	1,19,530.00
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2016-2017	1,79,628.00										
2017-2018	3,48,833.00										
2018-2019	1,19,530.00										
During 2018-2019 50KW renewable energy is generated and used. Through LED bulbs 15KW (15%) lighting facility is used (from out of 118KW total lighting requirements).											



2019-2020 Green Audit

MINUTE BOOK	
1.	Three Bio-gas plants are installed in the hostel campus for collecting all solid waste and generated gas is supplied to hostel mess for cooking purpose.
4.	At present, 35 min water harvesting tanks are installed in our College campus.
5.	All the waste materials are collected and converted into fertilizer by compost pits.
Recommendations	
1.	Under Green initiative "No Vehicle day" may be observed in the College campus to ensure less pollution and to maintain eco-friendly atmosphere.
2.	Through the use of LED bulbs more percentage of lighting facility can be increased to conserve energy.
3.	Additional Rain Water Storage facility can be initiated.
4.	Additional Solar Panel can be installed.
5.	Electric power shut downs for one hour may be observed in the campus.
   	



JAMAL MOHAMED COLLEGE (AUTONOMOUS)

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TIRUCHIRAPPALLI – 620 020

NAAC - SSR IV CYCLE

Criterion VII–Institutional Values and Best Practices

7.1 Institutional Values and Social Responsibilities

7.1.6 Quality audits on environment and energy are regularly undertaken by the institution

2018-2019 Green Audit

MINUTE BOOK			
GREEN AUDIT			
at Jamal Mohamed College Campus for the year 2018 – 2019			
The members of the Green Audit Committee inspected the premises of the College at 90.30 p.m. on 08.12.2018. The following observations have been made with regard to the audit and a few suggestions were also given to make the campus more eco and user friendly.			
Members Present			Date: 08.12.2018
S.No.	Name	Designation	Signature
1.	Dr. R. BABU RAJENDRAN	Professor, Dept. of Env. Biotechnology Bharathidasan University, Tiruchirappalli – 620 024	
2.	Dr. N. THAJUDDIN	Dean, Faculty of Science, Engineering and Technology and Professor, Dept. of Microbiology Bharathidasan University, Tiruchirappalli – 620 024 Mobile No : 9842379718	
3.	Mr. S.P. MOHAN	Founder President, Tamil Nadu Youth Ekamra 5, Salai Road East, Thiruvai Nagar, Trichy-18 Mobile No: 9894482572	
4.	Mr. P. PONMUSEKARAN	Non Medical Supervisor, Dept. of Public Health & Preventive Medicine, Timarasambal Block, Trichy No.35, Chavary Nagar North Extension Wardens Road, Airport Trichy- 620 007, Mobile No: 9791181082	
Previous Recommendation of the Green Audit Committee held on 15.12.2017, were implemented fully as detailed below: 1. Solar Energy panels were installed in the College campus. 2. Under the club activities, more than 10 special lectures were organized for creating awareness among students on Environmental issues to identify solutions. 3. Students of Science departments were motivated and involved in developing Bio-Fertilizer in our college campus and utilize in our coconut farm and vegetable gardens in the campus. 4. The Swachh Bharat Abhiyan many activities were strengthened by making our students to participate in the cleanliness campaign.			
Recommendations 1. Recommend to adopt a green initiative for a convenient day every year. 2. Recommend to collect the condensed water from all air conditioners and use it for Autoclaves, Distillation units etc. 3. Proposed to implement Modern Compost Bin to prepare Bio manure in the Hostels.			



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NAAC - SSR IV CYCLE

Criterion VII-Institutional Values and Best Practices

7.1 Institutional Values and Social Responsibilities

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2017-2018 Green Audit

MANAGING COMMITTEE																							
कार्यकारी मंडळीचे																							
CODE : CSR/009 MEETING NO. / संख्या		DATE / तारीख																					
RESOLUTION	PRESENT MEMBERS AND RESOLUTIONS		REMARKS																				
GREEN AUDIT at Jamal Mohamed College Campus for the year 2017 - 2018 The members of the Green Audit Committee inspected the premises of the College at 01.45 p.m. on 15.12.2017. The following observations have been made with regard to the audit and a few suggestions were also given to make the campus more eco and user friendly. Date: 15.12.2017 <u>Members Present</u> <table border="1"> <thead> <tr> <th>S.No.</th> <th>Name</th> <th>Designation</th> <th>Signature</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Dr. R. BABU RAJENDRAN</td> <td>Professor, Dept. of Env. Biotechnology Bharathidasan University, Tiruchirappalli - 620 024</td> <td></td> </tr> <tr> <td>2.</td> <td>Dr. N. THAJUDDIN</td> <td>Dean, Faculty of Science, Engineering and Technology and Professor, Dept. of Microbiology Bharathidasan University, Tiruchirappalli - 620 024 Mobile No : 9842379719</td> <td></td> </tr> <tr> <td>3.</td> <td>Mr. S.P. MOHAN</td> <td>Former President, Tamil Nadu Youth Exors 5, Salai Road Est., Thillai Nagar, Trichy-18 Mobile No: 9894487572</td> <td></td> </tr> <tr> <td>4.</td> <td>Mr. P. PONNUSELARAN</td> <td>Non Medical Supervisor, Dept. of Public Health & Preventive Medicine, Tiruverur Block, Trichy No 26, Causway Nagar North Extension Wireless Road, Airport Trichy- 620 007. Mobile No: 9791381082</td> <td></td> </tr> </tbody> </table> Recommendations of 2016-17 were implemented partially / fully • More awareness programmes have been organized on environmental issues. • The service club members have been motivated to arrange for special rally on the dangers of Flood. • Energy saving initiative programme have been organized for every class by way of switch on - off the lights and fans in the class rooms. • The existing Waste water treatment plant is successfully running and recycled water is used for gardening. The biogas plant and solid waste management is also functioning well. Recommendations • Solar energy panels may be installed for green energy • A few special lecture/ workshop can be arranged by various club students to create awareness on Environmental issues and their solution. • Involve the students of Science discipline to develop bio-fertilizer, etc. • Strengthen the activities of Swachh Bharat Abhiyan.				S.No.	Name	Designation	Signature	1.	Dr. R. BABU RAJENDRAN	Professor, Dept. of Env. Biotechnology Bharathidasan University, Tiruchirappalli - 620 024		2.	Dr. N. THAJUDDIN	Dean, Faculty of Science, Engineering and Technology and Professor, Dept. of Microbiology Bharathidasan University, Tiruchirappalli - 620 024 Mobile No : 9842379719		3.	Mr. S.P. MOHAN	Former President, Tamil Nadu Youth Exors 5, Salai Road Est., Thillai Nagar, Trichy-18 Mobile No: 9894487572		4.	Mr. P. PONNUSELARAN	Non Medical Supervisor, Dept. of Public Health & Preventive Medicine, Tiruverur Block, Trichy No 26, Causway Nagar North Extension Wireless Road, Airport Trichy- 620 007. Mobile No: 9791381082	
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