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INTERNAL QUALITY ASSURANCE CELL (IQAC)

St. John's College Anchal

ENERGY AUDIT ASSESSMENT TEAM

Internal Audit Team

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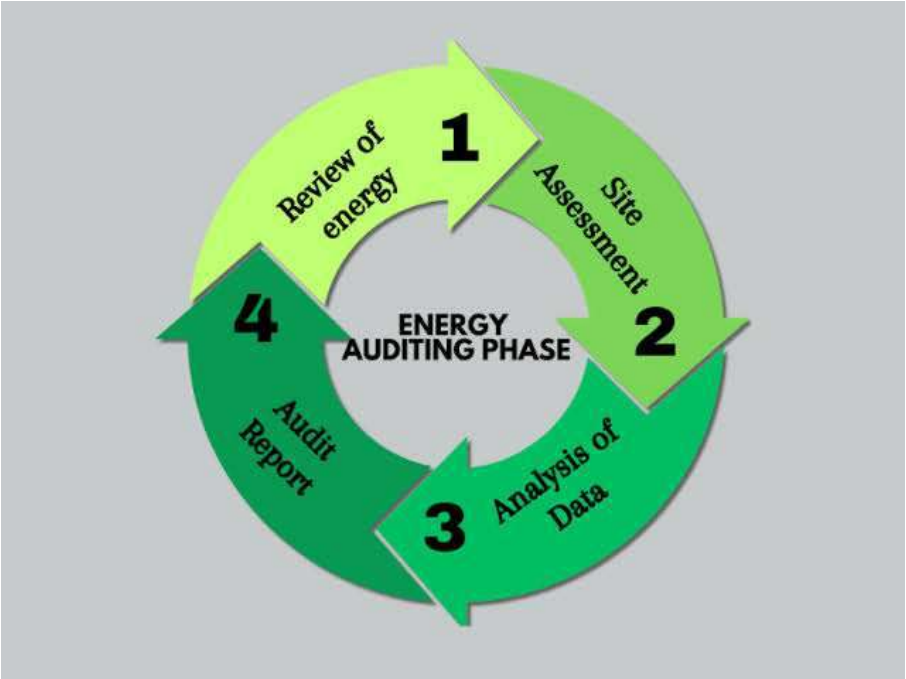
Supporting Team:

Dr. Anila George, Research and PG Department of Environmental Science

Mr. Arun M. George, Department of English & Communicative English



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Dr. JAYA D.S.
PROFESSOR

CERTIFICATE OF APPRECIATION FOR ENERGY AUDIT

This is to certify that St. John's College, Anchal, Kollam, Kerala has conducted a comprehensive energy audit to assess the efficacy of energy conservation initiatives by the college to maintain the campus eco-friendly. As per the report and credentials submitted, the activities and measures carried out by the college have been verified for validity and reliability. The efforts taken by the faculty and students towards the development of a sustainable green environment are highly appreciable and commendable.

Dr. JAYA D.S.
PROFESSOR
DEPT. OF ENVIRONMENTAL SCIENCES
UNIVERSITY OF KERALA, KARIAVATTOM
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Dr. Jaya D S
Professor
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1. PREFACE

Energy has been identified as a crucial and balancing factor in the indices for sustainable development since the Earth Summit in 1992. Especially in the contemporary scenario, it is acknowledged that the heavy and unbalanced energy consumption adversely affects energy price and economic growth, and most countries now give priority to energy conservation methods. The Energy Conservation Act, 2001, defines Energy auditing as the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption. It facilitates a systematic approach to the energy management in a system, trying to balance the total energy input with its use. It identifies all the energy streams in a system and quantities the use of energy according to its discrete functions. It is a study to determine how and where energy is used, and to identify methods for energy savings. The Energy Auditing for a day is the index of the consumption which normalizes the situation of Energy crisis by providing the schemes for conservation of energy. The opportunities lie in the use of existing renewable energy technologies, greater efforts at energy efficiency and the dissemination of latest technologies The energy audit of St. John's College was carried out by the students and teachers of the Research and PG Department of Environmental Science on behalf of IQAC, under the supervision of the Energy Audit team. This report is our effort in contributing to the larger picture of effective energy management and conservation. As is known, energy auditing is an on-going process, a part of a larger procedure to ensure long- term sustainable development. We have enlisted plausible solutions based on the outcome of our analysis of data, and our recommendations, which can be implemented wholeheartedly in the campus inorder to ensure minimizing energy waste and maximizing energy potential. We hope in all earnest that these will be given its due and that the audit will be fruitful in terms of energy conservation.

In the current scenario where energy consumption exceeds the supply, it is the social responsibility of an institution to optimize the use of energy to avoid any wastage. This necessitates the conduct of an energy audit. The Energy Audit is conducted periodically to assess the energy consumption pattern and the energy conservation measures adopted by the institution during each academic year. The Audit also aims at educating the youth about the need to work towards sustainable energy production and consumption practices. Data collection for the energy audit was done by a team of experts from 1 June 2021 to 31 May 2023. The audit targets to employ energy efficient appliances substituting the high energy consuming ones.

The data collected, covered the whole campus in which St. John's College functions, including classrooms, Seminar Hall, Auditorium Library, Computer Lab, and the Exam halls. The audit considered the number of electronic equipment in each department and its energy usage. High energy consuming appliances were identified and suggestions were provided to substitute those with energy efficient ones. Energy usage of occasionally used lab equipments were not considered in the formation audit report. The audit aimed at optimal use of available resources. Inefficiencies in the use of energy were assessed to take corrective measures.

2. INTRODUCTION

St, John's College Anchal is an educational system affiliated to Kerala university, which was established in 1964 by late Archbishop Most. Rev. Benedict Mar Gregorios and presently with the strength of 1300 students annually. Significant advances the college made in academic and research activities were matched with parallel improvements in the technical and infrastructure facilities of the campus, which makes it retain its position of excellence across time. It has 12 teaching departments housed in 10 blocks of buildings spread across 25.16 acres with built up area 2.48 acres. The college offers quality education and maintains consistently high academic standards, giving students equal opportunity for themselves and bettering their own life. The prime aim of the college is to reach out to students from socially and economically backward sections of society and to equip them with the necessary skills and education to meet the challenges of a rapidly changing world. The vast campus and the large number of rooms being in use as classrooms and other facilities necessitated the implementation of a separate transformer for the college. Electricity is the major energy sources of the college, supplied by KSEB, Kerala. Diesel oil is being used in the DG sets for in-house generation of electricity during power cut. A part of it is produced using On Grid Solar Power System. The amount of the electricity bill was climbing steadily across the years. This audit was undertaken in order to verify how effective these steps were, and also to identify loop holes, if any, in the existing practices, along with outlining measures for enhancing energy utilization.

As the power supply is very good in the area so the running hour of DG set is very less. It is advisable to put an energy meter on each DG set then it would be easy to conduct the efficiency of DG set. This way, the operator could also note down the unit generation and oil consumed. It may be noted that the efficiency of the DG set depends largely on the operating load factor. The maximum efficiency of the DG set is available at about 80-85% load factor

Each source of energy is important to each nation. They have a huge role to play in sustaining the country's economy and sustainable development. Colleges have a huge role to play in energy conservation and raising awareness among the next generation about the need for energy conservation. In addition to reducing power consumption, it is the duty of the next generation to conserve conventional energy sources. To create an awareness among students about the conservation of energy sources, it is imperative in the new era to increase the use of conventional energy sources in colleges.

3. OBJECTIVES

The Energy Audit Manual of the Energy Management Centre, Government of Kerala, defines the primary objective of any energy audit as determining ways to reduce energy consumption per unit of product output or to lower operating costs (www.keralaenergy.gov.in). The recommendations of the study will become a basis for future schemes of better energy consumption and preservation throughout the organization. Energy conservation and energy saving are essential for maintaining the sustainability of our environment. It is the responsibility of every higher educational institution to maintain these energy sustainability and energy conservation. With the view to implement energy conservation measures in the campus, St. John's College conducted an energy survey and prepared a report based on the survey. Specific objectives of the study are:

- Verify the steps adopted for energy management in the campus
- Spot the inefficient or inadequate practices, if any
- Improve the energy preserving measures and methods
- Identify potential energy saving opportunities
- Formulate feasible steps and measures to be adopted in the campus

4. METHODOLOGY

Energy audits are primarily classified into

- Preliminary Audit
- Detailed Audit

A Preliminary Audit uses existing data to look extensively at the existing energy consumption patterns and identifies the areas for improvement, sets reference points, and identifies areas for more in-depth study. A Detailed Audit is more comprehensive and is carried out in phases, evaluating all major energy using systems. It estimates energy savings and cost, and accounts for the energy use of all major equipments. Since the Detailed Audit is meant for educational institution, and because of the limited size and the amount of energy consumption of the institution, the Preliminary Audit method was chosen for the year 2020-23

5. DATA COLLECTION

All required data was collected by a team of experts. Data were collected on the number of fans, tubes, computers and other electronic devices in each room. According to survey the

following data were collected. For the purpose of this audit, audit groups for specific areas were formed. Data was collected through

- Visual inspection and observation
- Verification/ Identification of energy consumption
- Detailed calculations, analyses
- Validation

6. DIVISION OF WORK

A team of 2 students were formed in November 2021. One faculty from Energy audit team was put in charge of different blocks and necessary suggestions were given by the entire faculty in the department. They gathered the data under the guidance of the teachers. Department wise energy usage by instruments shown in Table 01

Table 01: Department wise energy usage

Room No	Fan (70 W)		LED Tube/ light (20 W)	CFL Tube light (36 W)	Bulb	Exhaust Fan	Computer	A.C	Fridge	TV	Printer	Xerox Machine	LCD Projector	CCTV Camera	LED Monitor	Camera monitor	LED Focus Light
	Celling	wall															
Principal Office Block	14		48			1	9	1		1	2	2		4	1	4	
Library	17		25			1	9		1					5			
Exam Hall I and II	23		33											4			
Auditorium	21		7										1	4			
Seminar hall and Conference Hall	18		34					6						3			
Computer Lab		8	16	5			18										
Department of English	16		22			1	1				1		1	2			
Department of Malayalam	13		14			1								2			
Department of Commerce and Data Science						1							1	2			
Department of Economics	10		12		3	1							1	1			
Department of Politics and Public administration	19		22		3	1							1	2			
Department of Chemistry	20	2	59	4	16	1	2		2		1		1	4	1		
Department of Physics	23	2	15		1	1	2	2			1		1	2			
Department of Mathematics	23		26			1	1					1	1	2			
Department of Botany and lab	23	1	25		10	1		1	1				1	1			
Department of Zoology and lab	26		48			1		1	1	1			1	1			
Department of Environmental Science and lab	14	1	19	1	2	1					2		1	1			
Department of Physical education	2		5			1											
Admission Room	2		5				2				1	1					
Mini Chapel	2		4		1									2		2	
Canteen and Mini tea stall	4	2	10		5	2			2					3			
University Exam room	1	2	4				2					1					
Gymnasium	2		4											1			
WDC	4	3	10			5											
NCC Room					2												
Building Peripherals				4										5			14
Total	**297**	**21**	**467**	**14**	**43**	**21**	**46**	**11**	**7**	**2**	**10**	**5**	**11**	**53**	**2**	**6**	**14**

7. DATA ANALYSIS

The gathered data was then quantified and segregated according to the following criteria:

1. Energy consumption by end use

2. Average energy use block-wise

3. Equipment-wise Consumption of Departments

4. Month-wise energy consumption

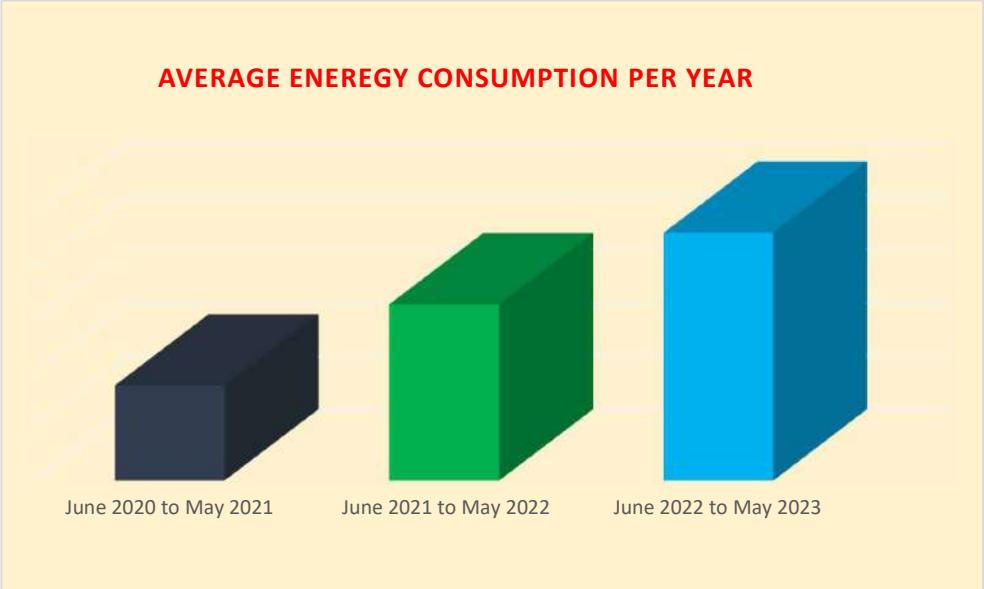
The quantified data are presented below as figures and tables for easy reference.

A preliminary analysis of power consumption of the college has been made by audit team based on KSEB bills, which is shown in Table 02

Sl. No.	Month	Consumption Unit (kWh)	Amount (Rs.)
1	June – July 2020	6713	24419
2	Aug – Sep 2020	6843	25617
3	Oct – Nov 2020	6514	23219
4	Dec – Jan 2021	6910	25123
5	Feb – March 2021	7145	26530
6	April – May 2021	5439	22620
7	June – July 2021	6915	25790
8	Aug – Sep 2021	7356	29432
9	Oct – Nov 2021	7438	30816
10	Dec – Jan 2022	7465	31257
11	Feb – March 2022	7543	33258
12	April – May 2022	5891	26490
13	June – July 2022	7984	39235
14	Aug – Sep 2022	8733	34862
15	Oct – Nov 2022	7948	33631
16	Dec – Jan 2023	7969	32240
17	Feb – March 2023	6744	23292
Total Power Consumption		121550	

Average monthly Power Consumption	**7119.6**	
Total Power Consumption: June 2020 to May 2021	**39564**	
Total Power Consumption: June 2021 to May 2022	**42608**	
Total Power Consumption: June 2022 to May 2023	**45297**	

Figure 01: Graph showing the average electric power consumption per year



8. MAJOR FINDINGS

Most of the lights used are LED lights, which are comparatively energy efficient. T12/T8 Fluorescent Tube lights are also used, which are not energy efficient. Major energy consumption is by ventilation, The fans used are of ordinary inefficient types and these can be retrofitted with BEE Star labelled ceiling fans (BLDC). Electronic fan regulators are used, which are energy efficient, Computer and peripherals and lighting load. The details of each appliance, in terms of location and numbers along with load details are provided in Table 03 of this document. The contribution of each category of other occasionally used lab equipment were not considered for analysis list and power utilisation of such instruments are provided in Table 04.

Table 03: Status of Power usage by major devices

Sl. No	Instrument Name	Energy usage (W)	Quantity	Average working hrs	Total Connected load (W)	Total Energy conception per day (W)	Total Energy conception per month (W)	Total Energy conception per month (kWh)
1.	LED Tube light	20	467	5	9340	46700	1401000	1401
2.	Bulb	50	43	5	2150	10750	322500	322.5
3.	CFL tube	11	14	5	154	770	23100	23.1
4.	Ceiling fan	75	297	5	22275	111375	3341250	3341.25
5.	Wall fan	60	21	5	1260	6300	189000	189
6.	Exhaust Fan	40	21	2	840	1680	50400	50.4
7.	CCTV Camera	15	52	7	780	5460	163800	163.8
8.	Refrigerator (double door)	300	4	24	1200	28800	864000	864
9.	Refrigerator (single door)	280	3	24	840	20160	604800	604.8
10.	Freezer	100	1	24	100	2400	72000	72
11.	Air Conditioner	1800	14	5	25200	126000	3780000	3780
12.	LED TV	80	2	2	160	320	9600	9.6
13.	Water Pump (1.5hp)	1500	1	2	1500	3000	90000	90
14.	Water Purifier	25	2	6	50	300	9000	9
15.	Computer	200	46	5	9200	46000	1380000	1380
16.	LCD Projector	50	11	3	550	1650	49500	49.5
17.	Printer	30	10	5	300	1500	45000	45
18.	Photo copier	83	5	5	415	2075	62250	62.25
19.	Water heater	1125	2	2	2250	4500	135000	135
20.	Electric stove	1000	1	2	1000	2000	60000	60
21.	Kettle	1200	3	2	3600	7200	216000	216
22.	Water cooler	80	4	1	320	320	9600	9.6
23.	Electric Bell	500	4	0.25	2000	500	15000	15
	Total Power consumption by frequently used instruments per year (kWh)							**12892.8**

Table 04: List of laboratory instruments and its power utilisation

Sl. No	Instrument Name	Energy usage (W)	Quantity
1.	Microwave oven	1000	1
2.	Induction cooker	1800	1
3.	Laboratory oven	750	5
4.	BOD Incubator	150	2
5.	Tissue floatation bath	400	1
6.	Centrifuge	120	7
7.	Water bath	400	3
8.	Hot plate	1200	4
9.	Double distillation unit	1000	1
10.	Single distillation unit	700	1
11.	Colorimeter	20	9
12.	Conductivity meter	10	5
13.	Potentiometer	3	5
14.	P^H Meter	2.5	4
15.	Weighing machine	4	7
16.	Electric Bunsen Burner	400	6
17.	Heating mantle	200	2
18.	Rotary high vacuum pump	180	1
19.	Invertor	50	2
20.	Fuming exhaust hood	400	1
21.	Deionization unit	120	1
22.	Magnetic stirrer with hot plate	400	10
23.	Electric Shaker	125	1
24.	UV-Cabinet	66	1
25.	UV Spectrophotometer	10	3
26.	Melting point apparatus	200	1
27.	Gauge meter	118	2
28.	GC	105	1
29.	Electrochemical work station	400	1

30.	Photo chemical reactor	160	1
31.	Muffle furnace	1800	1
32.	Sonicator	125	1
33.	Incubator shaker	24	1
34.	Suction pump	200	2
35.	Multi parameter	5	1
36.	Autoclave	100	1
37.	Laminar Air Flow	160	1
38.	Flame Photometer	250	1
39.	Spectro Photometer	80	2
40.	Soxhlet	450	1
41.	Inoculation hood	600	1
42.	6 AMP Soket	30	73
43.	16 AMP Soket	16	23

Since this was a Preliminary Audit, the findings are formulated as per the norms for this stipulated by the Energy Audit Manual of the Government of Kerala.

1. Establish energy consumption in the organization-

From the quantitative analysis of the gathered data, the following findings have been reached.

(a) The laboratories record the highest consumption based on end use

(b) The Administration and Library block record the highest rate of consumption

(c) Laboratory equipments show the highest rate of consumption equipment-wise

(d) water supply systems contribute a lion share in electrical consumption

(e) The time slots in the Afternoon record the highest consumption on a normal working day.

2. Identify the easiest areas of attention

Based on the physical observation and the analysis of data collected, certain areas have been identified as areas of attention.

(a) Old wiring cables in many parts of the campus leading to loss of energy

(b) Old water pipelines in several parts of the campus leading to waste of energy

(c) Use of incandescent bulbs in certain rooms

(d). Electric supply still depending on State Electricity Board, instead of solar panels

(e) Use of old equipments such as refrigerators in laboratories

(f) Uneven lighting facility certain classrooms are under-illuminated, certain classes have more lights than required.

3. Estimate the Scope for Saving

The study could identify a large scope for saving energy in the campus, including

(a) Updating of technologies in laboratory equipments.

(b) Replacing old electrical cables and pipelines.

(c) Replacing incandescent bulbs with LEDs.

(d) Ensuring even lighting facilities in rooms.

(e) Use of Solar panels as a main source of lighting, especially common areas and grounds.

(f) Replacing old gadgets in laboratories.

4. Identify immediate areas of improvement

Based on the study, certain areas were identified as requiring immediate improvement. These are

(a) The existing inefficient T12 & T8 fluorescent tube lights can be replaced with LED lights. Inefficient CFL can be replaced with LED bulbs

(b) Repairing and updating laboratory equipments.

(c) Encouraging students and staff to switch off electrical gadgets and turn off the water taps when not in use.

5. Identify areas of more detailed study

The study could also identify certain areas that necessitated more detailed study and long-term planning. These were

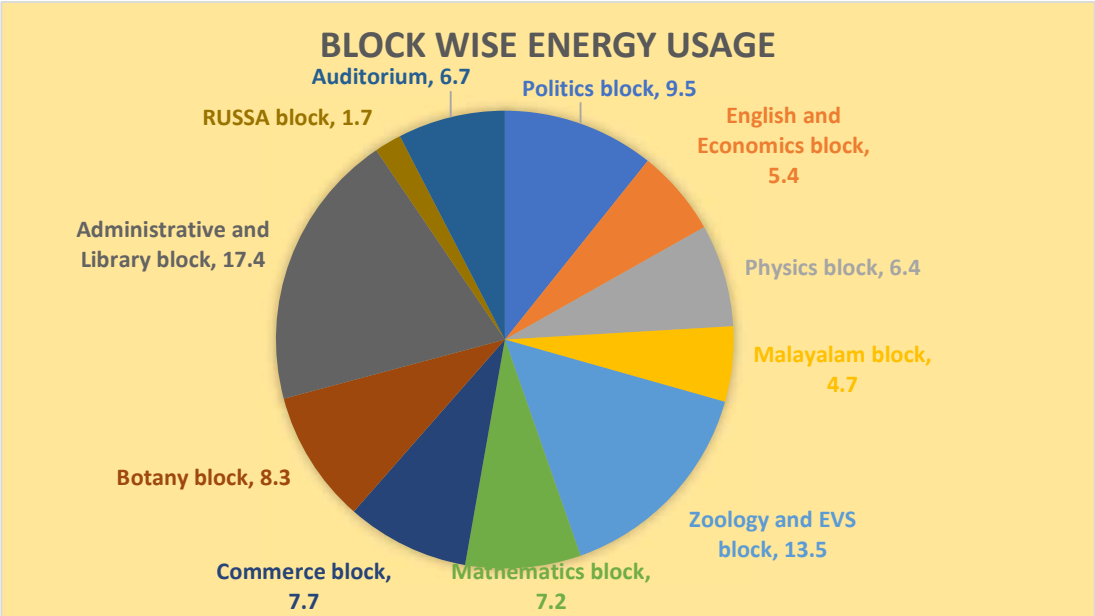
(a) Planning the electrical wiring more efficiently, doing away with unused power points and redundant electrical gadgets.

(b) Installing solar panels in possible buildings/ blocks.

Table 05: The block-wise usage of energy in percentage.

	Block	Usage (%)
1	Admission, Research and Chemistry block	11.5
2	Politics block	9.5
3	English and Economics block	5.4
4	Physics block	6.4
5	Malayalam block	4.7
6	Zoology and EVS block	13.5
7	Mathematics block	7.2
8	Commerce block	7.7
9	Botany block	8.3
10	Administrative and Library block	17.4
11	RUSSA block	1.7
12	Auditorium	6.7

Figure 02: Graph showing block wise energy usage



9. CLIMATE IMPACT

Climate change is disrupting the economies and lives of people in every country in every continent. In recent years, Kerala has seen the worst changing weather patterns, rising sea levels and greenhouse gas emissions are now at the highest levels in history. Wildfires, floods and

temperature rises have become a threat to the state of Kerala. Greenhouse gases dominated by Carbon di-oxide emission is the major reason for global warming and consequent climate change and carbon accounting provides a quantification of greenhouse gas emitted by the organization. In carbon accounting the major reasons of carbon emission within the organization are identified and quantification of the weight of carbon dioxide emitted is done based on scientific calculations and standard assumptions.

Emission due to electricity consumption from grid

Every unit of electricity consumption is associated with carbon emission according to the methods of power generation in the utility grid of the region According to Indian grid standards, 0.79 Kg is emitted per kWh of electricity generated.

CO2 emissions due to electricity consumption [kg]

= Grid emission factor [0.79Kg/kWh] X Electricity imported [kWh]

● Grid emission factor: The emission factor value for electricity consumption from grid is 0.79 Kg/kWh according to Central Electricity Authority database.

● Consumption of the institution: Annual value according to survey = 42489.66 kWh/Year

10. FINDINGS AND RECOMMENDATIONS

- Most of the power consumption is used for lighting, electric fans, computers and water pumping
- The peculiar heritage structure of buildings, with most of the rooms blessed with natural light and ventilation helps in reducing the number of lighting and ventilating equipments and gadgets.
- New buildings to be constructed should follow the pattern and assure natural light and air passage, to reduce loss of energy
- The electrical wiring of many buildings was found to be old and inefficient
- Replace old electrical cables with new ones
- Poor plumbing lines leads to loss of water and subsequent loss of power resulting from over
- Replace old pipelines with new ones, and latest motors for pumping water.
- There are a number of unused sockets and redundant power points causing power wastage.
- The number of sockets should be verified and ensured that only the good ones are being used.

- There seem to be a lack of judicious use of power among students and staff.
- During the study, it was found that lights, fans and computers were kept on working mode in many rooms, without a single person present.
- Students and staff should be exhorted constantly to use energy judiciously. Posters and pamphlets should be distributed and notices about saving energy should be posted at major points of campus
- Even lighting distribution system should be ensured.
- Incandescent bulbs should be replaced with LEDs
- Except for a small solar unit Planning to be installed, the entire power requirement is met from the KSEB line.
- More solar panels should be installed in key areas of the campus, and loads for common areas and grounds should be met from these.
- AC, refrigerators and freezers used in many departments use obsolete technology and hence cause power loss.
- Gadgets and equipments should be repaired and/or replaced with latest ones to save energy.
- Proper switching off the gadgets and equipments should be ensured strictly.

11. ENERGY SUSTAINABILITY INITIATIVES

Sustainable energy refers to the use of energy sources that do not deplete over time and do not harm other species or the environment. One of the ways to achieve sustainable energy is to install Roof-top Solar panels that can harness the abundant solar energy in the campus and reduce the electricity bills.

Another way is to promote sustainable and renewable energy alternatives that are supported by government subsidies. The college has already taken a step in this direction by installing Solar panels on the rooftop, which have started to generate renewable energy. Currently, the Solar panels produce 6 KV of energy, which is used in the administrative section of the building. The college hopes to continue its progress towards energy self-reliance.

12. CONCLUSIONS AND SUGGESTIONS

The energy audit is an assessment of the prevailing energy consumption patterns of the institution. This energy audit helped to assess the efficiency of power consumption in the institution and helped to suggest corrective measures to rectify the same. Energy audits if conducted periodically increases the scope of improvement in economic and environments aspects of power consumption.

1. A well-prepared electrical wiring plan for the campus, which would help identify unused points of power and also in re-wiring the buildings.

2. Electric fans should be serviced and bearings replaced wherever necessary.

3. The scope for non-conventional energy should be utilized.

4. Even though the heritage nature of buildings and Government restrictions may not help in wide installation of roof top solar panels, certain locations like the top of library building can be used for installing solar panels which would cut down power consumption.

5. Installation of a suitable Bio-gas plant to save energy used for heating water in Science laboratories.

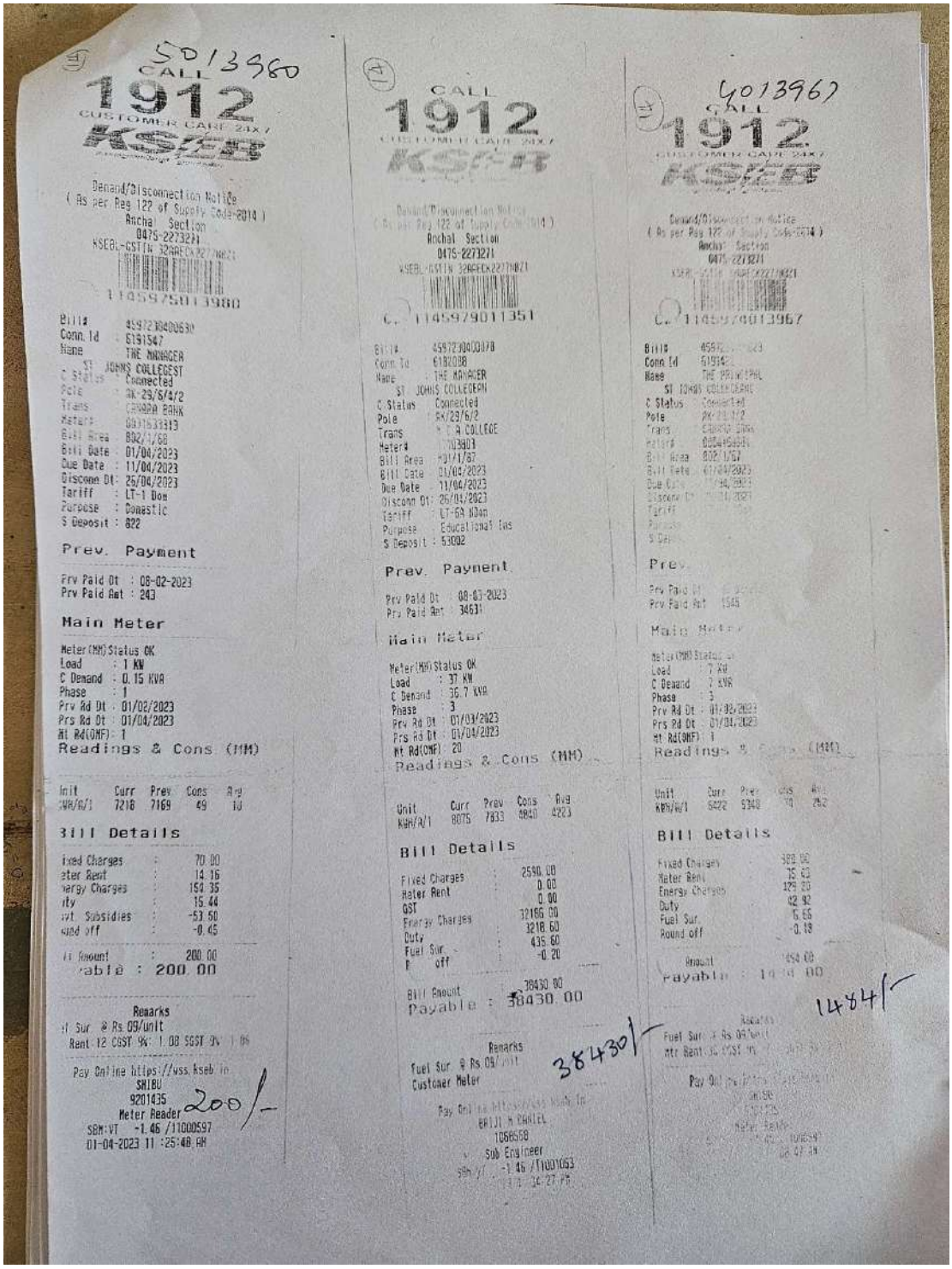
6. Rigorous training for both students and staff to inculcate awareness for the need of energy conservation. If everyone ensures switching o_ lights, fans and electrical gadgets that are not in use, roughly 10% to 15% of energy saving is possible.

7. A master switch located at a prominent place which can be directly supervised by the HoD/supervising staff would help avoid power wastage in closed rooms.

8. A healthy competition may be encouraged between departments by honoring those departments that produce higher savings by good practices. An element of weight-based on the above lines may be considered for allocation of funds.

9. It is suggested that a permanent body under the chairmanship of a senior teacher may be established in the College for periodical review of energy usage and concurrent energy audit. Representatives of students, staff and PTA may be included in the body. Conversion of ordinary tubes into LED tubes can save a major share of power consumption Effective use of classrooms and laboratories by switching off electrical gadgets after use Replacement of low power consuming equipment in laboratories instead of old ones Encouraging the application of solar energy.

Annexure 1: Sample KSEB Bill



CALL 1912
CUSTOMER CARE 24X7
KSEB

Demand/Disconnection Notice
(As per Reg 122 of Supply Code-2014)
Anchal Section
0475-2273271
KSEBL-GSTIN 32AAECK2277H1Z1

Bill#
Conn Id
Name : THE MANAGER
ST JOHNS COLLEGEST
C Status : Connected
Pole
Trans : CANARA BANK
Meter#
Bill Area
Bill Date : 01/04/2023
Due Date : 11/04/2023
Disconn Dt : 26/04/2023
Tariff : LT-1 Dom
Purpose : Domestic
S Deposit : 822

Prev. Payment

Prv Paid Dt : 08-02-2023
Prv Paid Amt : 243

Main Meter

Meter(MM) Status OK
Load : 1 KW
C Demand : 0.15 KVA
Phase : 1
Prv Rd Dt : 01/02/2023
Prs Rd Dt : 01/04/2023
Mt Rd(CMF) : 1

Readings & Cons (MM)

Unit	Curr	Prev	Cons	Avg
KWH/R/1	7218	7169	49	10

Bill Details

Fixed Charges	:	70.00
eter Rent	:	14.16
nergy Charges	:	154.35
uty	:	15.44
vt Subsidies	:	-53.50
ound off	:	-0.45
ll Amount	:	200.00
ayable	:	200.00

Remarks
el Sur @ Rs.09/unit
Rent 12 CGST 9% 1.08 SGST 9% 1.08

Pay Online https://wss.kseb.in
SHIBU
9201435
Meter Reader
SBM:VT -1.46 /11000597
01-04-2023 11:25:48 AM

200/-

CALL 1912
CUSTOMER CARE 24X7
KSEB

Demand/Disconnection Notice
(As per Reg 122 of Supply Code-2014)
Anchal Section
0475-2273271
KSEBL-GSTIN 32AAECK2277H1Z1

C. 11459/9011351

Bill#
Conn Id
Name : THE MANAGER
ST JOHNS COLLEGEAN
C Status : Connected
Pole
Trans : T C A COLLEGE
Meter#
Bill Area
Bill Date : 01/04/2023
Due Date : 11/04/2023
Disconn Dt : 26/04/2023
Tariff : LT-6A NDom
Purpose : Educational Ins
S Deposit : 53002

Prev. Payment

Prv Paid Dt : 08-03-2023
Prv Paid Amt : 34631

Main Meter

Meter(MM) Status OK
Load : 37 KW
C Demand : 36.7 KVA
Phase : 3
Prv Rd Dt : 01/03/2023
Prs Rd Dt : 01/04/2023
Mt Rd(CMF) : 20

Readings & Cons (MM)

Unit	Curr	Prev	Cons	Avg
KWH/A/1	8075	7833	4840	2223

Bill Details

Fixed Charges	:	2590.00
Meter Rent		0.00
GST		0.00
Energy Charges		32166.00
Duty		3218.60
Fuel Sur.		435.60
R off		-0.20
Bill Amount		38430.00
Payable	:	38430.00

Remarks
Fuel Sur @ Rs.09/unit
Customer Meter

384301-

Pay Online https://wss.kseb.in
BIJU M DANIEL
1066568
Sub Engineer
SBM:VT -1.46 /11001053
01-04-2023 11:27:25

CALL 1912
CUSTOMER CARE 24X7
KSEB

C. 11459/9013967

Bill#
Conn Id
Name : THE PRINCIPAL
ST JOHNS COLLEGEANE
C Status : Connected
Pole
Trans : CANARA BANK
Meter#
Bill Area : 802/1/67
Bill Date : 01/04/2023
Due Date
Disconn Dt
Tariff
Purpose
S Deposit

Prev.

Prv Paid Dt
Prv Paid Amt : 1345

Main Meter

Meter(MM) Status
Load : 7 KW
C Demand : 7 KVA
Phase : 3
Prv Rd Dt : 01/02/2023
Prs Rd Dt : 01/04/2023
Mt Rd(CMF) : 1

Readings & Cons (MM)

Unit	Curr	Prev	Cons	Avg
KWH/R/1	8422	8340	82	2x2

Bill Details

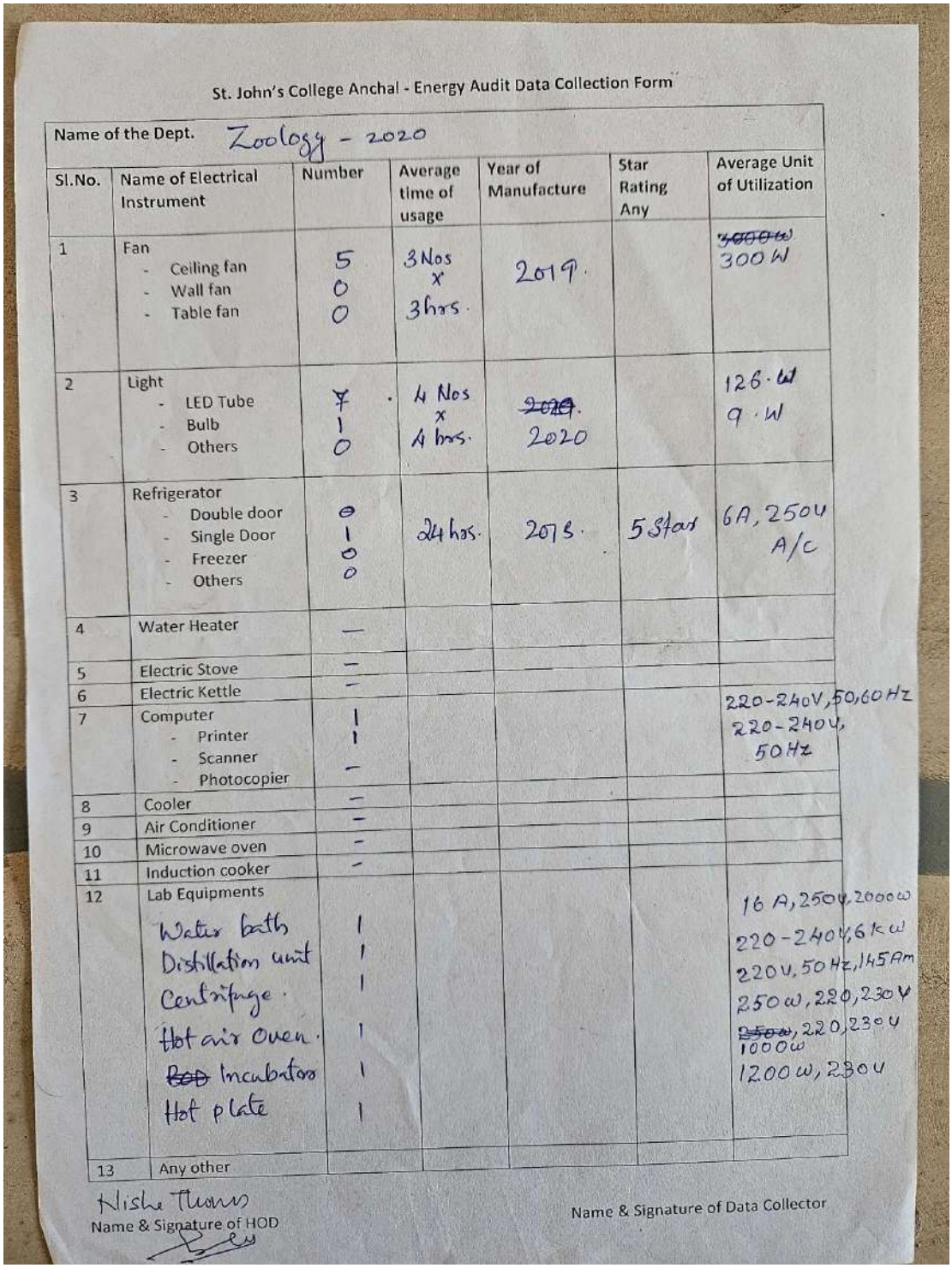
Fixed Charges		380.00
Meter Rent		14.16
Energy Charges		429.20
Duty		42.92
Fuel Sur.		5.65
Round off		-0.13
Amount		1454.00
Payable	:	1454.00

Remarks
Fuel Sur @ Rs.09/unit
Mtr Rent 12 CGST 9%

Pay Online https://wss.kseb.in
SHIBU
9201435
Meter Reader
SBM:VT -1.46 /11000597
01-04-2023 11:25:48 AM

1484/-

Annexure 2: Sample Questionnaire for survey



St. John's College Anchal - Energy Audit Data Collection Form

Name of the Dept. Zoology - 2020

Sl.No.	Name of Electrical Instrument	Number	Average time of usage	Year of Manufacture	Star Rating Any	Average Unit of Utilization
1	Fan - Ceiling fan - Wall fan - Table fan	5 0 0	3 Nos x 3hrs.	2019.		~~4000W~~ 300 W
2	Light - LED Tube - Bulb - Others	7 1 0	4 Nos x 4 hrs.	~~2019~~. 2020		126. W 9. W
3	Refrigerator - Double door - Single Door - Freezer - Others	0 1 0 0	24 hrs.	2018.	5 Star	6A, 250V A/C
4	Water Heater	—				
5	Electric Stove	—				
6	Electric Kettle	—				
7	Computer - Printer - Scanner - Photocopier	1 1 —				220-240V, 50/60Hz 220-240V, 50Hz
8	Cooler	—				
9	Air Conditioner	—				
10	Microwave oven	—				
11	Induction cooker	—				
12	Lab Equipments Water bath Distillation unit Centrifuge. Hot air Oven. ~~BOD~~ Incubator Hot plate	 1 1 1 1 1 1				16 A, 250V, 2000W 220-240V, 6KW 220V, 50Hz, 14.5Am 250W, 220, 230V ~~2500~~ 1000W, 220, 230V 1200W, 230V
13	Any other					

Nisha Thomas
Name & Signature of HOD

Name & Signature of Data Collector

Annexure 3: Selected Photographs of electric use