SAKTHI COLLEGE OF ARTS AND SCIENCE FOR WOMEN

ODDANCHATRAM – 624 619

ENERGY AUDIT REPORT

2020 – 2021

DEPARTMENT OF ENVIRONMENTAL SCIENCES

Bishop Heber College (Autonomous)

Tiruchirappalli, Tamilnadu – 620 017

CAMPUS ENERGY AUDIT

CERTIFICATE

This is to certify that detailed **Energy Audit** of **Sakthi College of Arts and Science for Women, Oddanchatram – 624 619, Tamilnadu** has been successfully conducted. The activities and measures carried out by the College have been verified based on the reports submitted by the College and found to be satisfactory. The College has evolved policies on Environment and Green campus in line with the Sustainable Development Goals. The efforts taken by the members of the faculty, students, support staff and the Management towards creating a strategic change in attaining holistic environmental sustainability is highly appreciated and commended.

D.J.S. Anand Karunakaran
Asst. Professor
P.G & Research Department of Physics
Bishop Heber College, (Autonomous)
Tiruchirappalli - 620 017.

CAMPUS GREEN AUDIT
CGA CERTIFIED
Bishop Heber College
DEPARTMENT OF ENVIRONMENTAL SCIENCES

Prof. A. ALAGAPPA MOSES
Associate Professor & Head
Department of Environmental Sciences
BISHOP HEBER COLLEGE (Autonomous)
Tiruchirappalli - 620 017

Date: 23 October 2021

Dr. D.J. S. AnandKarunakaran
Energy Auditor
Associate Professor
Department of Physics
Bishop Heber College (Autonomous)

Email: anandkkaruna@gmail.com
Mobile: +919865947332 / 6381773190

Prof. A. Alagappa Moses
Functional Area Expert – Ecology & Biodiversity
(Accredited by Quality Council of India - NABET)
Category A Projects *(vide AC MOM III, 2010 New Delhi)*
Associate Professor & Head,
Department of Environmental Sciences
Email: aalagappamoses@gmail.com
Mobile: +91 98424 90051

NABET
A Alagappa Moses
Empanelled Expert ,FAE
Eco Services India Private Limited
Approved Function Area/s : EB(A)

NABET QCI

Accredited by
NATIONAL ACCREDITATION BOARD FOR EDUCATION & TRAINING
QUALITY COUNCIL OF INDIA
QCI Office, 6th Floor, ITPI Building, Ring Road, I.P. Estate, New Delhi
Category A Projects
(vide AC MOM III, 2010 New Delhi

NISI DOMINUS FRUSTRA

ENERGY AUDIT
2020 – 2021

Content Page. No

5. ENERGY AUDIT METHODOLOGY

Tables

List of Figures

ENERGY AUDIT

1.1 Introduction

Energy audit has a vital role in the implementation of energy conservation measures. The energy audit enables the institution to meet the Energy efficiency Standards and to reduce carbon foot print. There are several types of energy audits that are commonly performed by energy service personnel or engineers with various degrees of complexity.

1.2 Need for Energy Audit

The energy crisis in the present day world has led us to the design of new energy efficient buildings. An energy audit establishes both where and how energy is being used, and the potential for energy savings. It includes a walk-through survey, a review of energy using systems, analysis of energy use and the preparation of an energy budget, and provides a baseline from which energy consumption can be compared over time. An audit can be conducted by an employee of the organization who has appropriate expertise, or by a specialist energy-auditing firm. An energy audit report also includes recommendations for actions, which will result in energy and cost savings. It should also indicate the costs and savings for each recommended action, and a priority order for implementation. As per the Energy Conservation Act, 2001, Energy Audit is defined 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. (Chandra Prakash et al, 2017).

1.3 Electrical Energy Audit

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 60W to 100W 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.

1.4 Energy-saving measures and Carbon Footprint Reduction

A carbon footprint is historically the total set of greenhouse emissions caused by an individual event organization or product. It is expressed as CO_2e (Carbon dioxide equivalent) which can broadly be defined as a measure of the greenhouse gas emission that are directly and indirectly caused by an activity or are accumulated over the life stages of a product or service (Wiedman and Minx, 2008; Igbokwe et al 2018)

Intergovernmental Panel on Climate (IPCC) reviewed 18 greenhouse gases with different global warming potential. According to United Nation Framework Convention on carbon dioxide (UNFCCC) and its Kyoto protocol, only Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) are considered for the purpose of carbon accounting, with others being regulated elsewhere (Hall and Murray, 2008).

The main elements that generates large amounts of carbon dioxide are fossil fuels (especially oil and coal), through burning them for obtaining energy. Of all greenhouse gases, CO_2 has the largest share. Thus, emissions of other greenhouse gases as stated earlier are converted into units of CO_2 equivalents (CO_2e) using the warming potential related to each gas.

The calculation of carbon footprint in Sakthi College of Arts and Sciencee has been carried out to set a standard on environmental policies and practices, operational platform to achieving a friendly accommodating and sustainable environment in the future (IPCC, 2000).

1.5 Electrical Energy Consumption

The Energy Audit Report of the Sakthi College of Arts and Sciencee during the period 2020 -21 are presented in the following section:

Electrical Unit Conversion

- voltage X ampere = Power (V X I = P)
- Unit: (volt X ampere = watt) One electrical Unit = 000W/hour
- *(1000 watt bulb glows 9for an hour or 100 watt bulb glows for 10 hours)*
- Power factor(pf)= [Actual power/ apparent power] X Power Factor

The total consumption of electricity was 4,100 unit for the academic year 2020-21. This includes air conditioners which consume about 12% of net consumed electrical energy.

One electrical unit (EU) equals consumption of 1000 watts per hour (1kWh) and requires 0.538 kg or approximately ½ kg of coal to produce the same.

The total quantity of coal required to produce 4,100 units of electricity (4,100 × 0.538 kg coal) = 2,205.8 kg or ≈ 2.2 ton coal this academic year.

CO_2 emission by coal One kilogram of coal emits 2.86 kg of CO_2, thereby increasing the carbon footprint which in turn contributes to global warming. Therefore, 369 tons of coal consumed indirectly by the Institution through consumption of 4,100 units of electricity led to the emission of (2,205.8 kg of coal × 2.86 kg CO_2) **6,308.6 kg or 6.3 ton of CO_2 into the atmosphere per year.**

Table. 1 Consumption Electrical Energy for first half of the Academic year 2020 – 21

S.No.	Month & Year	Consumed Unit in KWh
1	April ‘21	175.00
2	May ‘21	80.00
3	June ‘21	90.73
4	July ‘21	140.27
5	August ‘21	239.04
6	September ’21	393.68
7	October ‘21	392.68
TOTAL		**2039.24**

Table. 2 Details of UPS and Accumulators

Date Of Install	Capacity	Brand	Batt.Brand	Battery Nos	Battery Capacity	Battery Repalced	UPS Life in Year	Batt Life in Year
10/06/09	5KVA 3 no	kondass	Exide-EL	48	80Ah	16.09.2017	10	8
03/02/12	20KVA 2 no	Numeric power	Exide-EL	30	100Ah	03.08.2018	10	8

Table.3 Total Consumption of Electrical Energy in EU Vs Carbon emission and Carbon footage

Net Unit Consumption 2020-21	Carbon Emission In Ton	CO2 Foot Print In Ton
4,100 (EU)	2.2058	6.3086

The net carbon foot print as CO_2 by electrical energy = **6.31 ton**

Chart : Historical Data Analysis:

Based on the historical data The electrical energy consumption (2020-21)= **4,100 KWh or EU**

Observation:

- The Power factor is good but need to improve.
- The Load Factor is low could be improve to get the benefits of good Load F actor.
- MD KVA under sanctioned load. There is no load demand

Remedies:

- It is suggested to install a Thyristor 100 kVA A PFC panel with 7.68% - 8.02% detuned reactors.
- Installation of local transformer to extended load near future to a capacity of 110 KVA suggested.
- Install a Maximum Demand Controller

Benefits:

- You will get 3.5 % discount on your basic bill amount by maintaining PF close to Unity.
- Bb achieving Load Factor above 75 % you will get 1% discount for each percent. upto 90% Load factor and total discount will be 15 % on basic value.

By installing Demand Controller you can avoid charges for excess demand. The facility may save Rs. 10,000 (Approx) per month

Conclusion:

The present energy consumption is **4,100 kWh** per annum (during pandemic period approximately). The proposed energy consumption shall be 7,000 kWh per annum (Normal period approximately) which will vary as per the season

Saving Terms:

The saving in terms of monitory benefit will be **2.5 lacs** per annum only (without Roof Top Solar Power Plant) and **3.5 lacs** per annum only (with Off Grid 100 kW ROOF TOP SOLAR POWER **PLANT)**

2. Fuel Consumption Audit

2.1 Diesel Consumption

The consumption of 1,12,593 liter of diesel for the academic year 2020-21. 1 liter of diesel weighs 835 gram. Diesel consists for 86.2% of carbon, or 720 gram of carbon per liter diesel. In order to combust this carbon to CO_2, 1920 gram of oxygen is needed. The sum is then 720 + 1920 = 2640 gram or 2.7 kg of CO_2/liter diesel.

2.2 Transportation

Table.4 Details of the Annual Fuel Consumption by transportation

Root .No	Km covered / month	Diesel in liter
1	110	687.50
2	82	512.50
3	112	700.00
4	110	687.50
5	96	600.00
6	113	706.25
7	108	675.00
8	88	550.00
9	128	800.00
10	110	687.50
11	130	812.50
12	96	600.00
13	110	687.50
14	90	652.50
TOTAL		**9358.75**

The total consumption of diesel by transportation = 9358.75 liter

2.3 Generator Details-

Generator used in the college are three, and used for power generation by diesel as backup power source. The details of generator and average fuel consumption are mentioned in given table.

Table.5 Campus Generator Capacity and Consumable fuel for Backup Electrical Energy

S.No	Specification	Make	Consumption Liter/hr	Duration / hour	Consumption /month
1	15 KVA/ 3 Phase	Kirloskar	3	08	24

Table.6 Campus Annual Consumption of Liquid Fuel

Consumable	Liter/year
Transportation	1,12,305
Generators	288
Total	**1,12,593**

The total consumption during the academic year 2020-21 is 1,12,593 liter and therefore net weight of CO_2 emitted in to the atmosphere 1,12,593 X 2.7 = 3,04,001 Kg or 304 ton.

The total estimated carbon foot print by consumption of liquid fuel is 304 ton

2.4 Assessment of CO2 emaciation by LPG

1 liter of LPG weighs 550 gram. LPG consists for 82,5% of carbon, or 454 gram of carbon per liter of LPG. In order to combust this carbon to CO2, 1211 gram of oxygen is needed. The sum is then 454 + 1211 = 1665 gram of CO2/liter of LPG. 1 Kg of LPG = 1.94 liter

Table.7 Monthly consumption of LPG in the campus

S.No	Location	Cylinders /month
1	Hostel	08
2	Canteen	02
TOTAL		**10**

Total No of cylinders 10 X 19 = 190 Kg

Consumed LPG in liters = 190 Kg X 1.94 = 368.6 liters

Emitted quantity of CO_2 = 368.6 X 1.67 = 615.6 Kg **= 0.616 ton**

The total estimated carbon foot print LPG is 0.616 ton

2.5 FIRE WOOD

The carbon dioxide released when burning wood (about 1900g CO_2 for each 1000g of wood burnt) is balanced by the fact that this carbon was taken up by the tree from the air when it grew. So this part of the emissions is carbon-neutral. However, many other chemicals are produced when wood is burnt, including one of the most potent greenhouse gases, nitrogen dioxide; although the amounts may be small (200 g of CO2 equivalent per kg of wood burnt), the gas is 300 times more potent as a greenhouse gas than carbon dioxide and lasts 120 years in the atmosphere.

Table.8 Campus Annual Consumption of Fire Wood

S.No	Location	Fire wood /month in Kg
1	Hostel	10,000
	Total	**10,000**

Let 10,000 Kg X 1.9 = 19,000 Kg or 19 ton of CO_2 emitted to the atmosphere

The total estimated carbon foot print by consumption of Fire wood is 19; ton

Table.9: The total Carbon foot prints in the campus per year

S.No	CO_2 Emission of Consumption	Quantity in ton
1	Electrical Energy	6.31
2	Diesel	304.00
3	LPG	0.62
4	Fire wood	19.00
	TOTAL	**329.93**

The total Carbon foot prints in the campus per year as by emission CO_2 in to the atmosphere per year is 329.93 ton

3. Carbon offset

3.1 Campus Carbon Offset

The following table shows the carbon offset due to energy efficient light fixtures during 2020-21

Table.10 Carbon Offset by energy efficient light Fittings

Energy efficient electrical light fixtures						
S.No.	**Article**	**Replaced Article**	**Quantity**	**Duration/ day in Hour**	**Energy consumed /Day in EU**	
					(Actual)	**(Earlier)**
01	LED (20W)	CFL (40W) Street lights	40	8	6.4	12.8
02	LED (9/12W)	CFL/Tube /(60W)bulbs	40	7	2.52	16.8
				Total	**8.92**	**29.6**

Electrical energy saved 29.6 – 8.92 = 20.68 EU / Day. (Reduction in electrical energy)

The annual carbon Offset

20.68 X 0.538 = 11.126 Kg of coal required

11.126 X 2.86 = 31.82 X 30 X 12 = 11,455.32 or 11.46 ton / year

An amount of 11.46 ton Carbon offset per year in the campus by replacing with Energy efficient electrical light fixtures.

Table.11 Assessment of carbon foot print in the campus

S.No	**Sources of Carbon Emission and Carbon Footprint**	**Quantity of CO_2 Estimated in ton**
1	Electrical Energy	6.31
2	Diesel	304.00
3	LPG	0.62
4	Fire wood	19.00
TOTAL		**329.93**
Carbon Offset in the campus		
2	Carbon Offset by Energy Efficient lights	-11.46
Net Carbon footprint assessment of the campus		**318.47**

The net assessed Carbon foot prints in the campus for the academic year 2020-21 (emission of $CO_{2)}$ is 318.47 ton

3.2 Carbon offset suggestions

The management of **Sakthi College of Arts and Sciencee is** conscious of this damage to the environment and has been implementing various programs/activities to reduce energy consumption on the one hand and increase green energy sources on the other. They are:

a) Replacing high energy-consuming lighting system with energy-efficient lighting systems.

b) Installation of 100 KVA solar PV power systems which is in process through which analysis of CO_2 reduction is succeeded.

c) Installing energy-efficient lighting system Based on the recommendations of the Electrical Energy consumed last year, the Institution has reduced CO_2 emissions indirectly by replacing high energy-consuming electric bulbs with energy-efficient LED lighting systems by 10% will reduce 29.6 KWh or electrical units per year.

Solar energy is produced by the sun's light - photovoltaic energy offers many benefits that make it one of the most promising energy

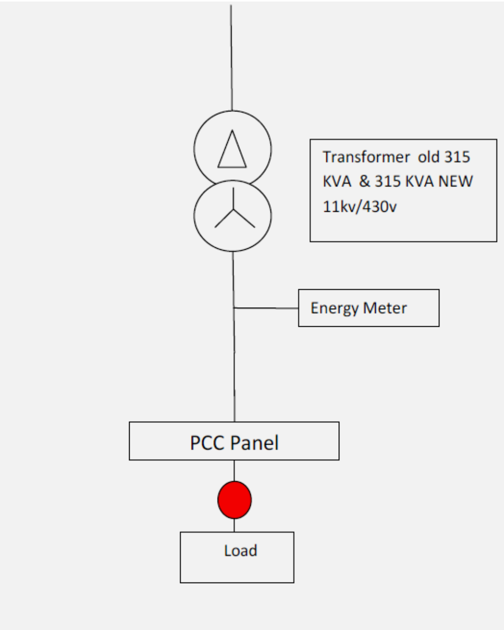
i. Renewable
ii. Inexhaustible
ii. Non- polluting
iv. Avoids global warming
v. Reduces use of fossil fuels
vi. Reduces energy imports
vii. Contributes to sustainable development

The Ministry of New ad Renewable Energy (MNRE), Govt. of India has been promoting the aim to develop and deploy New and Renewable energy for supplementing the energy requirement of the country.

4. Power Quality Observations & Remedies

4.1 Site Description.

The detailed Single Line Diagram is available with Sakthi College of Arts and Science . The basic site survey was conducted as per following Single Line Diagram.



4.2 Existing Scenario with the Installation under survey

Table.12 Main HT Details

EB Service No.	
Sanctioned Load	60 VA
Phase	3
Voltage on LV side	433 V
Voltage on HV side	11 KV
Amperes on LV	333.3
Amperes on LV	13.12

4.3 Bus Bars

In the campus each block is split into power line and lighting line and provided with LT Panels respectively**.** The bus bar configurations are given below

- **i. Mains 2’ x 1.5’**
- **ii. LT Panels 2’ X 1’, 2’X 0.5, 2 X 0.25’**

4.4 IEEE-519-1992 Consideration and Value for Plant under survey

The said standard id applicable at the PCC (Point of Common Coupling). In above mentioned SLD at Survey Point no.1 is the point of coupling.

As per the standards; the harmonic limits are to be considered at PCC Recommended Limits for these ratios as per IEEE-519-2014 are as here under.

Table. 13 IEEE-519-1992 Consideration and Value for Plant under survey

Maximum Harmonic Current Distortion in Percent of IL						
Individual Harmonic Order (Odd Harmonic)						
Isc//L	<11	11<h<17	17<h<23	23<h<35	35<h	TDD
<20*	4.0	2.0	1.5	0.6	0.3	5.0
20<50	7.0	3.5	2.5	1.0	0.5	8.0
50<100	10.0	4.5	4.0	1.5	0.7	12.0
100<1000	12.0	5.5	5.0	2.0	1.0	15.0
>1000	15.0	7.0	6.0	2.5	1.4	20.0
Even harmonic are limited to 25% the odd harmonic limits above						
Current distortions that result in a offset, e.g. half –wave convertes are not allowed						
*All power generation equipment is Limited to these values of current distortion. regardless of actual/sc//L						
Where /sc =maximum short-circuit current at PCC /L =maximum demand load current (fundamental frequency component) at PCC. TDD =Total demand distortion (RSS).harmonic current distortion in% of maximum demand load current (15 or 30 min demand). PCC =Point of common coupling.						

Voltage Distortion Limits

Bus Voltage at PCC Voltage THD (%)	Individual Voltage Distortion (%)	Total Distortion
69 kv and below	3.0	5.0
69.000 kV through 161kv	1.5	2.5
161.001 kV and above	1.0	1.5
Note: High-voltage systems can have up to 2.0% THD where the cause is an HADC terminal that will attenuate by the time it is tapped for a user.		

Table.14 Voltage Current and Harmonic Values

RMS Voltage Values							
	Phase R-Y	Phase Y-B	Phase R-B	Phase R-N	Phase Y-N	Phase B-N	Ph N-G
Min Value	464.66	468.49	468.61	268.93	269.07	271.30	0.24
Ave Value	464.77	468.61	468.70	268.97	269.13	271.37	0.25
Max Value	464.82	468.73	468.77	269.01	269.18	2671.42	0.27

RMS Current Values				
	Phase R	Phase Y	Phase B	Neutral
Min Value	10.05	6.79	4.73	7.90
Ave Value	10.25	6.97	4.98	7.99
Max Value	10.45	7.15	5.22	8.09

PEAK Current Values				
	Phase R	Phase Y	Phase B	Neutral
Min Value	25.03	19.32	16	23.54
Ave Value	25.81	20.45	17.23	24.48
Max Value	26.68	21.83	18.67	25.55

	HARMONIC LEVEL IN %					
	Phase R	Phase Y	Phase B	Phase N	As per IEEE in %	As per MSEDCL in %
Voltage	**0.85**	**0.90**	**1.1**	230	Up to 5%	Up to 5 %
Current	40	45	75	105	Up to 10 %	Up to 10 %

Frequency	
Max	50.02
Avg	50.02
Min	50.02

4.5 Observations

1. Due to unbalanced and non linear load condition in each phase, harmonics in neutral is 230% and 105% in voltage and current respectively.
2. 3rd and 7th harmonic is present in the system. This is observed due to SMPS ie computer load & electronic ballasts.
3. Current in Neutral is 14.5 amp and 80 amp to maximum level.
4. Voltage harmonics are under permissible limits of MSEDCL and IEEE norm, while the Current harmonics are above the ideal values and these harmonics were induced through machinery.
5. Spikes are observed, no spike protection is provided to the system.
6. Overall Voltage supplied by grid is on HIGHER SIDE.

4.6 Remedies

1. For Harmonics of 7th order the APFC panel (automatic power factor control) of 50 KVA with 7.68% detuned reactors and 525v capacitors with thyristerised switching is to be installed.

2. For harmonics of 3rd and 9th order the earthing is to be done .The detailed specification is given below.

- Make proper earthing as per IEC 60364-5-54 to meter as well as control panels.
- It is suggested to install new earthing system the details are as below:
- Make OBO Betterman, Germany
- Length of Earth electrode: 1250 mm, Diameter of earth electrode: 14.2mm. Tested as per IEC 60364-5-54.
- Earth conductivity enhancing mineral compound of 5KG
- Total quantity required = 03 no. set (80 KVA) .(3 X 80 = 240KVA)

3. Install a Spike Protection Device, for protection from sudden high current spike which occurs due to high voltage. This is to be installed next to Energy Meter; also in each control panel.

4.7 The Specification for SPD is as follows

I. For protection against the Lightening surge and Surge through power lines (HT),

- Combi controller = 1 nos. to be connected to transformer LT side. Technology : MOV for L to N and SG for N to PE, Normal line voltage 230/ 400 v, 50Hz.
- Impulse current (10/350 micro sec), 7 KA and 25 KA.
- Response time < 25 nano seconds.
- Voltage protection level 900 volts & 1200 volts.

II. For protection against internal surges.

- Surge Controller = 4 nos. to be installed at each floor east and west side.
- Technology : MOV for L to N and SG for N to PE, Normal line voltage 230/ 400 v, 50Hz.
- Nominal discharge current 8/20 micro sec. = 20 KA & 50 KA.
- Voltage protection level = 1300v and 1200 volt.
- Response time less than 20 nano sec.

4.8 Effect on system

1. Circuit will be free from harmonic current.
2. The voltage regulation will be good, which results in low maintenance and saving in units also.
3. Neutral Current will be minimizing so very negligible amount of current will be there.

5. Energy Audit Methodology

5.1 Electrical Distribution System:

Scope of Work:

- To study existing electrical distribution system
- Measure/ Record the 12 hrs Load distribution
- To suggest various energy efficient measures with first order cost benefit analysis.

5.2 Methodology:

A. Census :

1) Find out the electrical normal & emergency loading.

Type of tariff

- Rating of installed transformer
- General hygiene as per standard maintenance practices
- Operating hrs data were collected from respective person

B. Indoor Lighting

Scope of work

- To study the existing lighting scenario of facility & verify the building data
- To find out the performance of lighting fixture
- To calculate the ILER (Lux/ watt/ m2) & compare lux with the bench mark /prevailing std in the facility.
- To suggest various energy efficient measures with first order cost benefit analysis

Censes

- Upto 80% of the lighting fixture were inspected for following
- No.of light installed & no of light working.
- Type of lights, General hygiene as per std maintenance practices
- Operating hrs data were collected from respective person.

5.3 Computer

Scope of work :

- To study existing computer at facility and verify the billing data.
- To Find out the power drawn.
- To compare the power drawn with the bench mark or prevailing standard in the facility.

- To identify the causes of deviation in the performance & suggest recommendation for corrective actions.
- To suggest various energy efficient measures with the first order cost benefit analysis.

5.4 Methodology

Census:

- Up to 80% of the computers printers & faxes were inspected for following.
- No of computers printers & faxes installed.

5.5 Scope of work:

- To study existing pumping system at facility and verify the billing data.
- To carry out analysis.
- To Find out the performance of the pumping system.
- To compare the operating efficiency with the bench mark or prevailing standard in the facility.
- To identify the causes of deviation in the performance & suggest recommendation for corrective actions.
- To suggest various energy efficient measures with the first order cost benefit analysis.
-

5.6 Methodology

Census:

- All water pumps were audited for following.
- Total no of pumps installed.

5.7 Report Writing

A detailed report of all the outcomes

i. Observations
ii. Remedies
iii. Census
iv. Data Collections
v. Data Processing
vi. Data Analysis
vii. Results
viii. Summery
ix. Suggestions and
x. Conclusions are repotted in defined format for documentation and further references

Figurative representation of campus assessment

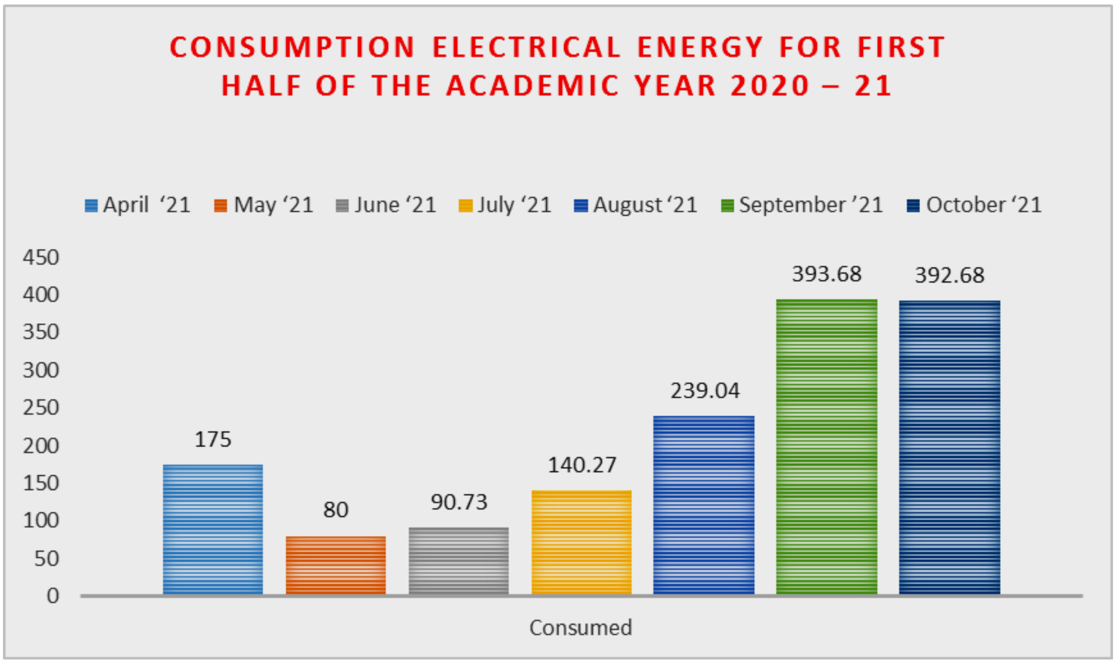


Fig.1 Electrical energy consumption minth wise for the first half of the acadcimic year 2020-21

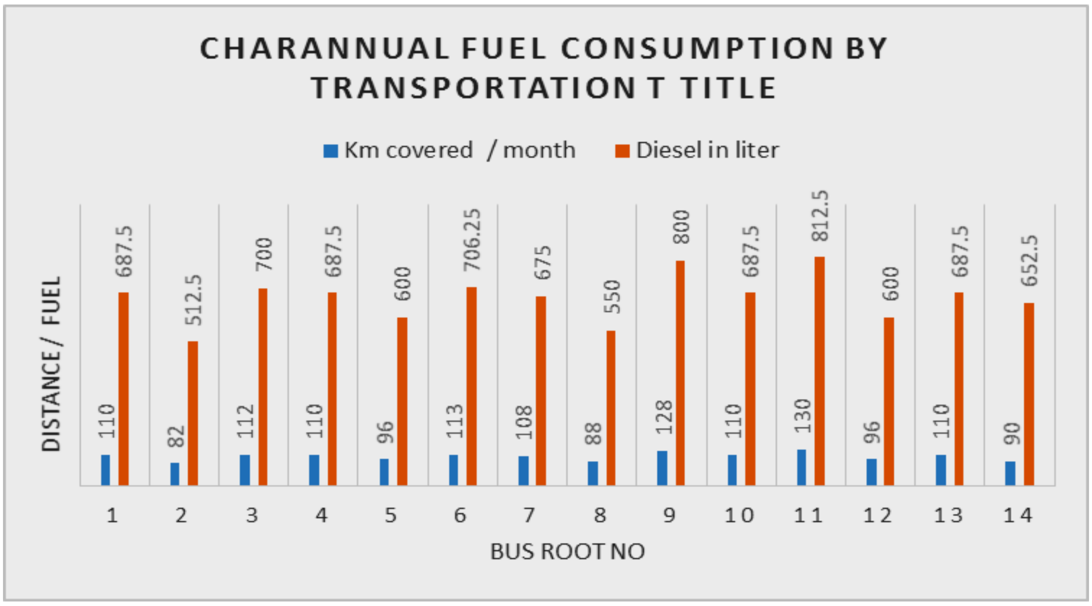


Fig.2 Details of the distance covered and annual fuel consumption by transportation for the academic year 2020 – 21

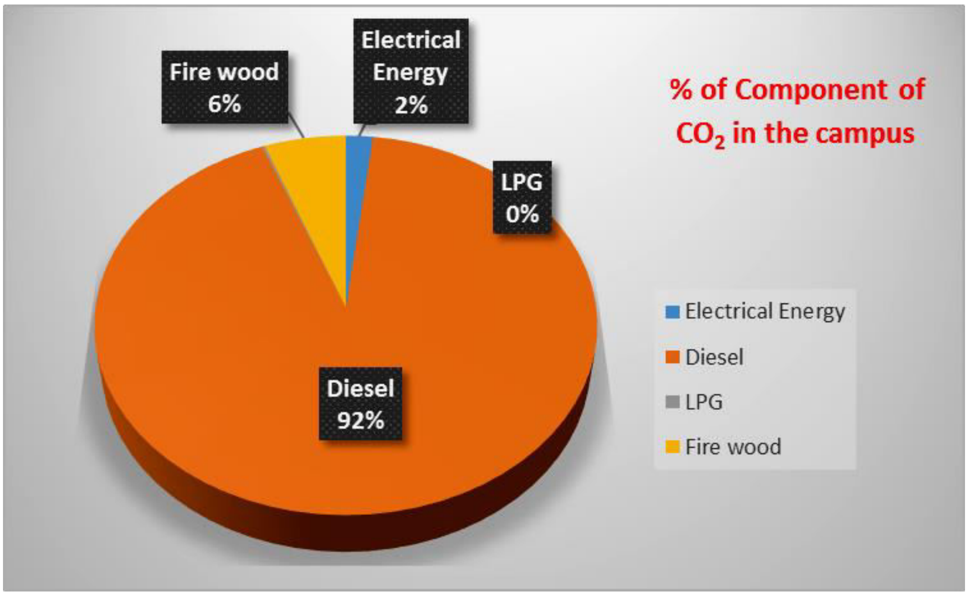


Fig.3 The Net component of Carbon foot prints in the campus in the academic year 2020-21

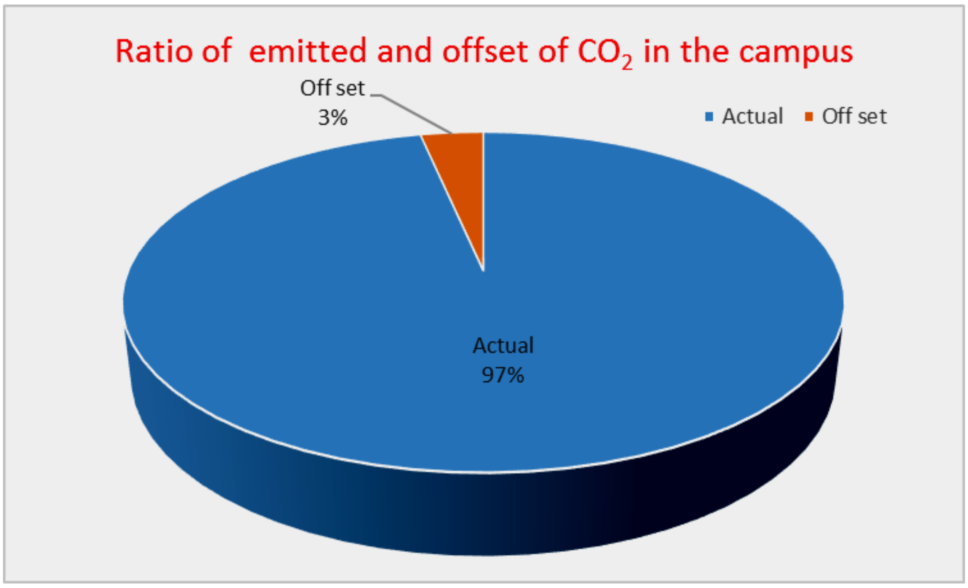


Fig.4 The proposition of carbon offset to net emmission of CO_2