GREEN AUDIT REPORT

ST.JOSEPH'S COLLEGE OF PHARMACY CHERTHALA

Executed by

OTTOTRACTIONS
Energy - Engineering - Environment

2023

OTTOTRACTIONS
Energy - Engineering - Environment

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Government of India.

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14001:2015 Certified (22DEJE84)

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CHERTHALA

OTTOTRACTIONS
Energy-Engineering-Environment

Green Audit Report

St. Joseph's College of Pharmacy, Cherthala

Report No: EA 985

2023

About OTTOTRACTIONS

OTTOTRACTIONS established in 2005, is an organization with proven track record and knowledge in the field of energy, engineering, and environmental services. They are the first Accredited Energy Auditor from Kerala for conducting Mandatory Energy Audits in Designated Consumers as per Energy Conservation Act-2001. Government of Kerala recognized and appreciated OTTOTRACTIONS by presenting its prestigious "The Kerala State Energy Conservation Award 2009" for the best performance as an Energy Auditor. Ottotractions is an ISO 9001-2015 and ISO 14001-2015 Certified organization, which ensures the quality of its services.

Acknowledgment

We were privileged to work together with the administration and staff of St. Joseph's College of Pharmacy, Cherthala for their timely help extended to complete the audit and bringing out this report.

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

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

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

Thank you.

B V Suresh Babu
Accredited Energy Auditor
AEA 33, Bureau of Energy Efficiency
Government of India

Preface

Educational institutions always had an important leadership role in society in demonstrating types of changes that used to occur with respect to the prime issues of the time. All around the world, educational institutions are taking steps to declare themselves the next carbon neutral school as a part of the global trend of becoming sustainable. In 2007, Victoria University School of Architecture and Design declared themselves the first carbon neutral campus in the world through the purchase of carbon credits. This concept is not a sustainable model as it does not guarantee the capture of carbon forever and also it is expensive.

The potential for any academic institution- (may be a school in a remote village or a university in an urban setting) - to become the driver for change is huge. Its role of practicing leadership in its community can be utilized to encourage and influence carbon neutral living.

The biggest factors that contribute towards emission are Energy, Transportation and Waste. Any reduction in the carbon emission by the above sectors, starts with the behavioral changes (Low cost) and/or technological investments (High cost). In order to make these changes, the students are to be educated properly on the concept of carbon neutral campuses and methods to reduce it.

In India, the concept of carbon neutral campuses is gaining momentum. Green Audit in Campuses measures the amount of Green House Gases (GHG) emissions produced as a result of its operations through an accounting like inventory of all the sources of GHGs and carbon sequestration in the school campus. Based on this, the total carbon footprint is estimated. Measures are recommended to bring down the carbon footprint of the campus and to make it a carbon neutral campus.

B. Zachariah
Director, OTTOTRACTIONS

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1 Introduction

Background

All across the developed countries, educational institutions are now moving to a sustainable future by becoming carbon neutral and greener spaces. They are taking responsibility for their environmental impact and are working to neutralize those effects. To become carbon neutral, institutions are working to reduce their emissions of greenhouse gases, cut their use of energy, use energy efficient equipment, use more renewable energy, plant and protect green cover and emphasize the importance of sustainable energy sources. Institutions that have committed to becoming carbon neutral have recognized the threat of global warming and are therefore committing to reverse the trend. Studies on this line has not struck roots in most of the developing countries-especially among students.

The Sustainable Development Goals (SDGs), launched by the United Nations in 2015, are an excellent vehicle for driving this change. They represent an action plan for the planet and society to thrive by 2030. The SDGs provide a window of opportunity for creating multidimensional operational approaches for climate change adaptation. They address poverty, hunger and climate change, among other issues central to human progress and sustainable development, such as gender equality, clean water and sanitation, and responsible consumption and production.

The Green Audit of college aims to assist campus to reduce their carbon footprint and educate tomorrow's leaders about strategies for carbon mitigation using their campus as a model. Also, this audit covers institutes responses towards SDGs by covering SDG 3,6,7,11,13,15. The green audit also aims to educate students and teachers on the concept of carbon footprint and to enable the students to collect data pertaining to the carbon emissions and carbon sequestration in their campus and to calculate the specific carbon footprint of the campus.

The project also suggests plans to make the campus carbon neutral or even carbon negative by implementing carbon mitigation strategies in areas such as,

a. Energy
b. Transportation
c. Waste minimisation
d. Carbon Sequestration etc.

The major objectives of the audit are:

- To make aware students and teachers on the concept of carbon footprint.
- To calculate the specific carbon footprint of the campus and classify it as carbon negative, neutral or positive.
- To create carbon mitigation plans to reduce their footprint based on the data generated.

ST. JOSEPH'S COLLEGE OF PHARMACY, CHERTHALA

St. Joseph's College of Pharmacy is one of the pioneers in the field of pharmacy education in Kerala. It is a unit of Nirmala Province of the Medical Sisters of St. Joseph (MSJ Dharmagiri), Aluva, Kerala, India. The Medical Sisters of St.Joseph is a Christian Congregation dedicated to St.Joseph, started in the year 1944 by Servant of God Rev. Msgr.Joseph. C. Panjikaran. (Photo)We are called to the Congregation of Medical Sisters of St. Joseph in order to experience the merciful love of the Father, revealed through Jesus Christ and to reciprocate that love through loving service to the poor, the sick and the least of the brethren, to share it in our community and to attain holiness of life. The Founder was a highly qualified person with a divine vision, the vision of the great prophet Isaiah. "The spirit of the Lord is upon me, because he has anointed me to preach good news to the poor. He has sent me to proclaim release to the captives

and recovering of sight to the blind, to set at liberty those who are oppressed to proclaim the acceptable year of the Lord".

Occupancy Details	
Particulars	2022-23
Total Students	439
Staffs	62
Total Occupancy of the college	501

For calculating per capita carbon emission estimation, only the student strength is taken into account.

Form-A											
BASELINE DATA SHEET FOR GREEN AUDIT											
1	Name of the Organisation	St. Joseph's College of Pharmacy									
2	Address (include telephone, fax & e-mail)	St. Joseph's College of Pharmacy, Dharmagiri College Campus, Naipunnya Road, Cherthala, Kerala 688524									
3	Year of Establishment	1944									
4	Name of building and Total No. of Electrical Connections/building	7 Blocks									
5	Total Number of Students	Boys		Girls		Total	439				
6	Total Number of Staff	62									
7	Total Occupancy	501									
8	Total area of green cover (hectare)	2.02									
9	Type of Electrical Connection	HT	0	LT	7						
10	Total Connected Load (kW)	85									
11	Average Maximum Demand (KVA)	-									
12	Total built up area of the building (M^2)	7964									
13	Number of Buildings	7									
14	Average system Power Factor	0.98									
15	Details of capacitors connected	0									
16	Transformer Details (Nos., kVA, Voltage ratio)	TR 1	Remarks								
		0									
17	DG Set Details (kVA,)	DG1	DG2	DG3	DG4	DG5	Remarks				
		62.5									
18	Details of motors	Rating	Nos.	Remarks							
		5 to 10	2								
		10 to 50									
		Above 50									
19	Brief write-up about the firm and the energy/environmental conservation activities already undertaken.	30kWp Solar power plant is installed, Bhoomithrasena club, Water conservation activities, Energy conservation activities,Biogasplants installed ($6m^3$+$2m^3$)									
20	Contact Person & Telephone number	Dr. Sr. Daisy P.A									
		8606673068									

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METHODOLOGY

2.1. Sensitisation

Low Carbon campus initiatives are successful when everyone in the campus is engaged including students, teachers and staff. A team of students, teachers and staff were formed to participate in the audit. A sensitisation among students and teachers on the concept of carbon footprint was conducted.

During the audit the students and staffs were sensitised on the project and trained to be a part of the data collection team. This helped in conducting the survey in a participatory mode so that the awareness will penetrate to the grass root level. During the data collection field visit it was stressed that the team will spread these ideas to their homes and friends. This will help in a horizontal and vertical spread of the message to a wider group. It is assumed that through 501 occupants of this campuses will reach same number of households. This message will spread to at least 2004 individuals approximately.

2.2 Estimation of carbon footprint

A carbon footprint is the amount of greenhouse gases—primarily carbon dioxide—released into the atmosphere by a particular human activity. A carbon footprint can be a broad measure or be applied to the actions of an individual, a family, an event, an organization, or even entire nation. It is usually measured as tons of CO_2 emitted per year, a number that can be supplemented by tons of CO_2-equivalent gases, including methane, nitrous oxide, and other greenhouse gases.

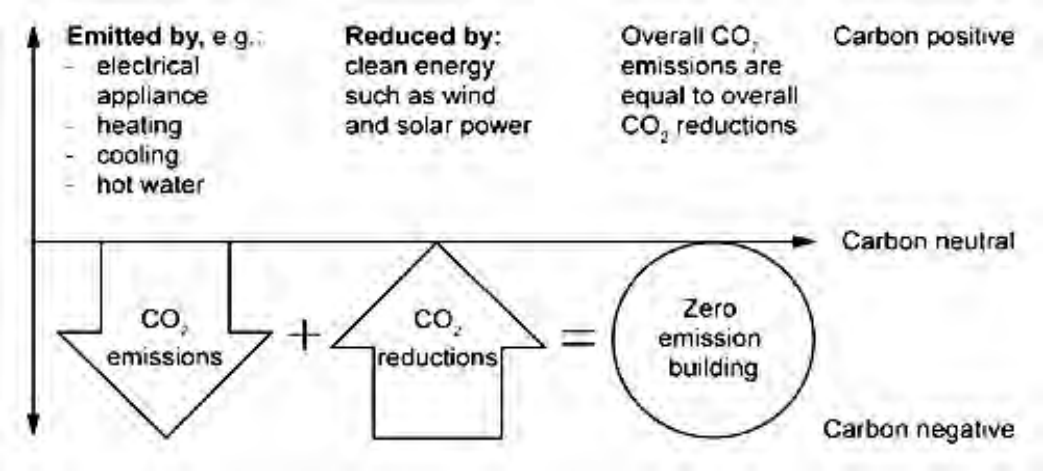
Global Warming Potential (GWP) is a measure of how much heat a greenhouse gas traps in the atmosphere up to a specific time horizon, relative to carbon dioxide. The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of one ton of a gas will absorb over a given period of time, relative to the emissions of one ton of carbon dioxide (CO_2).

Global Warming Potentials (IPCC Second Assessment Report)					
Species	Chemical formula	Lifetime (years)	Global Warming		
			20 years	100 years	500 years
Carbon dioxide	CO2	variable §	1	1	1
Methane *	CH4	12±3	56	21	6.5
Nitrous oxide	N2O	120	280	310	170
HFC-23	CHF3	264	9100	11700	9800
HFC-32	CH2F2	5.6	2100	650	200
HFC-41	CH3F	3.7	490	150	45
HFC-43-10mee	C5H2F10	17.1	3000	1300	400
HFC-125	C2HF5	32.6	4600	2800	920
HFC-134	C2H2F4	10.6	2900	1000	310
HFC-134a	CH2FCF3	14.6	3400	1300	420
HFC-152a	C2H4F2	1.5	460	140	42
HFC-143	C2H3F3	3.8	1000	300	94
HFC-143a	C2H3F3	48.3	5000	3800	1400
HFC-227ea	C3HF7	36.5	4300	2900	950
HFC-236fa	C3H2F6	209	5100	6300	4700
HFC-245ca	C3H3F5	6.6	1800	560	170
Sulphur hexafluoride	SF6	3200	16300	23900	34900
Perfluoromethane	CF4	50000	4400	6500	10000
Perfluoroethane	C2F6	10000	6200	9200	14000
Perfluoropropane	C3F8	2600	4800	7000	10100
Perfluorobutane	C4F10	2600	4800	7000	10100
Perfluorocyclobutane	c-C4F8	3200	6000	8700	12700
Perfluoropentane	C5F12	4100	5100	7500	11000
Perfluorohexane	C6F14	3200	5000	7400	10700

The methodology for carbon footprint calculations is still evolving and it is emerging as an important tool for green house management. In the present study carbon emission data from the campus is estimated under four categories viz.

a. Energy
b. Transportation
c. Waste minimisation
d. Carbon Sequestration

Carbon neutrality refers to achieving net zero GHG emission by balancing the measured amount of carbon released into atmosphere due to human activities, with an equal amount sequestrated in carbon sinks. It is crucial to restrict atmospheric concentrations of GHGs released from various socio-economic, developmental and life style activities using biological or natural processes. It is recognized that addressing climate change is not as simple as switching to renewable energy or offsetting GHG emissions. Rather, providing an opportunity for innovation in new developmental activities for viable and effective approach to address the problem.



Energy

In the campus carbon emission from energy consumption is categorised under two headings viz. energy from Electrical and Thermal. Energy used for transportation is calculated under transportation sector.

A detailed energy audit is conducted to understand the energy consumption of the campus. Information on total connected loads, their duration of usage and documents like electricity bills are evaluated. Connected loads are calculated by conducting a

survey on electrical equipment on each location. Duration of usage was found out by surveying the users. The survey of equipment was conducted in a participatory mode.

The fuel consumption for cooking was studied by analysing the annual fuel bills and usage schedules during the study. Discussions were carried out with the concerned individuals who actually operate the cooking system.

Transportation

Carbon emission from transportation to be calculated by using the following formula:

Carbon Emission = Number of each type of vehicles × Avg. fuel consumed per year ×Emission factors (based on the fuel used by the vehicle)

Only vehicles operate from the campus will take in to the account of transportation. The private vehicles are not considered for accounting carbon foot print. As private vehicle footprint will be in the account for personal footprint.

Waste Minimisation

The waste generated from the campus is also responsible for the greenhouse gas emission. So, in order to calculate the total carbon foot print of the campus it is necessary to estimate the greenhouse gas emission from the waste generated in the campus by the activity of the students, teachers and staffs.

The calculation of the waste generated has been conducted by keeping measuring buckets for collecting the waste generated in a day. This waste so generated was calculated by weighing it.

Carbon Sequestration

Carbon sequestration is the process involved in the long-term storage of atmospheric carbon dioxide. Trees remove carbon dioxide from the atmosphere through the natural process of photosynthesis and store the carbon in their leaves, branches, stems, bark, and roots

Carbon sequestrated by a tree can be found out by using different methods. Since this study is employed the volumetric approach, the calculation consists of five processes.

- Determining the total weight of the tree
- Determining the dry weight of the tree
- Determining the weight of carbon in the tree
- Determining the weight of CO_2 sequestrated in the tree
- Determining the weight of CO_2 sequestrated in the tree per year

Detailed calculations and results are given below.

Step 1: Determine the total green weight of the tree

The green weight is the weight of the tree when it is alive. First, you have to calculate the green weight of the above-ground weight as follows:

W above-ground= 0.25 D2 H (for trees with D<11)

W above-ground= 0.15 D2 H (for trees with D>11)

W above-ground= Above-ground weight in pounds

D = Diameter of the trunk in inches

H = Height of the tree in feet

The root system weight is about 20% of the above-ground weight. Therefore, to determine the total green weight of the tree, multiply the above-ground weight by 1.2:

$W_{\text{total green weight}} = 1.2 * W_{\text{above-ground}}$

Step 2: Determine the dry weight of the tree

The average tree is 72.5% dry matter and 27.5% moisture. Therefore, to determine the dry weight of the tree, multiply the total green weight of the tree by 72.5%.

$W_{\text{dry weight}} = 0.725 * W_{\text{total green weight}}$

Step 3: Determine the weight of carbon in the tree

The average carbon content is generally 50% of the tree's dry weight total volume. Therefore, in determining the weight of carbon in the tree, multiply the dry weight of the tree by 50%.

$W_{\text{carbon}} = 0.5 * W_{\text{dry weight}}$

Step 4: Determine the weight of carbon dioxide sequestered in the tree

CO_2 has one molecule of Carbon and 2 molecules of Oxygen. The atomic weight of Carbon is 12 (u) and the atomic weight of Oxygen is 16 (u). The weight of CO_2 in trees is determined by the ratio of CO_2 to C is 44/12 = 3.67. Therefore, to determine the weight of carbon dioxide sequestered in the tree, multiply the weight of carbon in the tree by 3.67. $W_{\text{carbon-dioxide}} = 3.67 * W_{\text{carbon}}$

3

RESULTS AND DISCUSSIONS

3.1 CARBON FOOTPRINT ESTIMATION

3.1.1 ENERGY

a. Electricity

Electricity is purchased from KSEB under 7 LT-6F Ndom Connections, the details are given below.

Electricity Connection Details		
St. Joseph's College of Pharmacy		
1	Name of the Consumer	St. Joseph's College of Pharmacy Chenganoor
2	Tariff	LT 6B Ndom
3	Consumer Number	1155127001836 1155127020395 1155127024177 1155121023494 1155127001759 1155120024402 1155126023569
5	Connected Load Total (kW)	85
6	Annual Electricity Consumption (kWh)	27061

Electricity Bill Analysis

Animal House(1155127001836)	
2022-23	
Month	**kWh**
Feb-22	32
Apr-22	29
Jun-22	22
Aug-22	7
Oct-22	12
Dec-22	93
Total	**195**

B-Pharm (1155127020395)	
2022-23	
Month	**kWh**
Feb-22	781
Mar-22	950
Apr-22	1031
May-22	283
Jun-22	965
Jul-22	833
Aug-22	1015
Sep-22	751
Oct-22	598
Nov-22	740
Dec-22	846
Jan-23	787
Total	**9580**

Hostel (1155127024177)	
2022-23	
Month	**kWh**
Feb-22	898
Mar-22	1066
Apr-22	1220
May-22	298
Jun-22	1149
Jul-22	1402
Aug-22	921
Sep-22	726
Oct-22	637
Nov-22	820
Dec-22	1119
Jan-23	845
Total	**11101**

M-Pharm (1155121023494)	
2022-23	
Month	**kWh**
Feb-22	241
Mar-22	245
Apr-22	309
May-22	66
Jun-22	337
Jul-22	308
Aug-22	195
Sep-22	209
Oct-22	184
Nov-22	236
Dec-22	275
Jan-23	212
Total	**2817**

Mess Hall (1155127001759)	
2022-23	
Month	**kWh**
Feb-22	145
Apr-22	160
Jun-22	283
Aug-22	308
Oct-22	249
Dec-22	476
Total	**1621**

Convent (1155120024402)	
2022-23	
Month	**kWh**
Feb-22	101
Apr-22	371
Jun-22	543
Aug-22	382
Oct-22	145
Dec-22	56
Total	**1598**

Security Room (1155126023569)	
2022-23	
Month	**kWh**
Feb-22	12
Apr-22	10
Jun-22	16
Aug-22	41
Oct-22	37
Dec-22	33
Total	**149**

Annual Electricity Consumption (kWh)				Connected Load (kW)
Sl. No	Location	Consumer No	2022-23	
1	Animal House	1155127001836	195	2
2	B-Pharm	1155127020395	9580	38
3	Hostel	1155127024177	11101	17
4	M-Pharm	1155121023494	2817	15
5	Mess Hall	1155127001759	1621	4
6	Convent	1155120024402	1598	8
7	Security room	1155126023569	149	1
Total			**27061**	**85**

b. Diesel

Diesel Consumption Details				
	Vehicles	Generator	Total	cost
	in L	in L	in L	Rs
2022-23	5930	221	6151	590501

c. LPG

LPG Consumption Details	
Particulars	2022-23
No Cylinders	30
LPG Consumption in kg	570
Total in kg	570

Base Line Energy Data		
St. Joseph's College of Pharmacy		
		2022-23
1	Electricity KSEB (kWh)	27061
2	Electricity Solar Consumption (kWh)	23122
3	Electricity (KSEB + Solar) kWh	50183
4	Electricity Solar Export (kWh)	15203
5	Diesel (L)	6151
6	LPG (kg)	570
7	Biogas (m^3)	28000

Energy Consumption Profile			
Sl No	Fuel	2022-23	
		kCal	kWh
1	Electricity	43157380	50183
2	Diesel	64586053	75100
3	LPG	6840000	7953
4	Biogas	6160000	7163
Total		**120743433**	**140399**

Thermal Fuel Consumption	
St. Joseph's College of Pharmacy	
	2022-23
Annual LPG consumption in kg	570
Annual Diesel consumption in L	6151
Annual petrol consumption in L	0
Annual Biogas consumption in m3	28000

Specific Energy Consumption

OTTOTRACTIONS- ENERGY AUDIT		
St. Joseph's College of Pharmacy		
Energy Performance Index (EPI)		
Sl No	Particulars	2022-23
1	Total building area (m^2)	7964
2	Annual Energy Consumption (kCal)	120743433
3	Annual Energy Consumption (kWh)	140399
4	Total Energy in Toe	12.07
5	Specific Energy Consumption kWh/m^2	17.63

3.3. Waste Generation total

The major concern of waste management will be focused on the solid waste produced by the campus. Solid wastes produced in the campus are mainly of three types, food waste, paper waste, and plastic waste. Food wastes produced in the campus are mainly by two means. The vegetable wastes produced in the kitchen during the food preparation. The food waste produced by the students and staffs of the campus after the consumption of meals.

Degradable Waste

Degradable Waste Generation	
St. Joseph's College of Pharmacy	
	2022-23
Total Occupancy	501
Waste generated in kg /day	10.02
Waste generated in kg /Yr	1202.4

Non-Degradable waste

Solid non degradable Waste Generation	
St. Joseph's College of Pharmacy	
	2022-23
Total Occupancy	501
Waste paper generated in kg /day	0.1002
Waste plastic generated in kg /day	0.1503
Waste paper generated in kg /Yr	12.024
Waste plastic generated in kg /Yr	18.04

3.4. Transportation

One bus and two cars are used for transportation.

Carbon Emission Profile (2023)

Carbon emissions in the campus due to the day-to-day activities are calculated and is discussed below. The emission factors considered for estimation and its units are given.

Emission Factors		
Item	Factor	Unit
Electricity	0.00082	tCo_2e/kWh
LPG	0.0015	tCo_2e/kg
Diesel	0.0032	tCo_2e/kg
Petrol	0.0031	tCo_2e/kg
Food Waste	0.00063	tCo_2e/kg
Paper Waste	0.00056	tCo_2e/kg
Plastic Waste	0.00034	tCo_2e/kg

Carbon Foot Print 2021-22

Carbon Foot Print			
Sl. No.	Particulars	2022-23	tCO2e
1	Electricity (kWh)	50183	41.15
2	Diesel (L)	6151	19.68
3	LPG (kg)	570	0.86
4	Biogas (M3)	28000	39.20
5	Degradable Waste in kg/yr.	1202.4	0.76
6	Paper Waste in kg/yr	12.02	0.007
7	Plastic Waste in kg/yr	18.04	0.01
Total Carbon Foot Print tCO2e/yr			101.66

3.5. CARBON SEQUESTRATION

All the activities including energy consumption and waste management have their equivalent carbon emission and they positively contribute to the carbon footprint of

the campus. Carbon sequestration is the reverse process, at which the emitted carbon dioxide will get sequestrated according to the type of carbon sequestration employed. Even though there are many natural sequestration processes are involved in a campus, the major type of sequestration among them is the carbon sequestration by trees.

Carbon Sequestration	
Particulars	2022-23
Carbon sequestrated by trees in the campus (tCO2e)	2.30

Trees sequestrate carbon dioxide through the biochemical process of photosynthesis and it is stored as carbon in their trunk, branches, leaves and roots. The amount of carbon sequestrated by a tree can be calculated by different methods. In this study, the volumetric approach was taken into account, thus the details including CBH (Circumference at Breast Height), height, average age, and total number of the trees, are required. Details of the trees in the campus compound are given in the Table 3.18. Detailed table is included in the technical supplement.

Carbon sequestrated by a tree can be found out by using different methods. Since this study is employed the volumetric approach, the calculation consists of five processes.

- Determining the total weight of the tree
- Determining the dry weight of the tree
- Determining the weight of carbon in the tree
- Determining the weight of CO_2 sequestrated in the tree
- Determining the weight of CO_2 sequestrated in the tree per year

Carbon sequestrated by each species of trees in the campus compound is given in the technical supplement.

CARBON FOOTPRINT OF THE CAMPUS (2022-23)

Various carbon emitting activities such as consumption of energy, transportation and waste generation leads to the total emission of **101.66 tCO_2e** per year by the campus. The total carbon sequestration by trees in the campus compound is **2.30 tCO_2e**.

Thus, the current carbon footprint of the campus will be the difference of total carbon emission and total carbon sequestration/mitigation. the following table shows the carbon footprint level of 2022-23.

Specific CO2 Footprint

Amount of Carbon to be mitigated for Low Carbon Campus		
Sl No	Particulars	2022-23
1	Total carbon emission tCO2e	101.66
2	Total carbon sequestration tCO2e	2.30
3	Amount of carbon mitigated through renewable energy tCO2e	70.63
4	To be mitigated tCO2e	28.73
5	Total No of Students	439
6	Specific Carbon Footprint kg CO2e/Student/Yr	65.45

The total specific carbon emission is estimated as **65.45** kg of CO_2e per student for the year 2022-23.

4

Carbon Mitigation Plans

The total emission of the carbon dioxide per student is **65.45** kg per year (2022-2023). Emission reduction plans were prepared to bring the existing per capita carbon footprint to zero or below so as to bring the campus a carbon neutral or carbon negative campus.

This can be achieved in many ways but, every alternate plan must be in such a way that, it must fulfill the actual purpose of each activity that is considered.

Here, three major methods are taken in to account as the plans for reducing the carbon emission of the campus.

- Resource optimisation
- Energy efficiency
- Renewable energy

RESOURCE OPTIMISATION

The effective use of resources can limit its unnecessary wastage. Optimal usage of the resources (such as fuels) can save the fuel and can also reduce the carbon emission due to its consumption. This technique can be effectively implemented in the 'transportation' and 'waste' sectors of the campus.

WASTE MINIMISATION

Optimal utilisation of paper and plastic stationaries can reduce the frequency of purchase of items. This can reduce the unnecessary wastage of money as well as the excess production of waste. In the case of food, proper food habits and housekeeping practices can optimise its usage.

Currently, the campus is taking an appreciable effort to reduce the unnecessary production of wastes. But the campus still has opportunities to reduce the generation of waste and can improve much more. Resource optimisation can be effectively implemented in all type of waste generated in the campus and the campus can expect about 50% reduction the total waste produced.

ENERGY EFFICIENCY

Energy efficiency is the practice of reducing the energy requirements while achieving the required energy output. Energy efficiency can be effectively implemented in all the sectors of the campus.

FUELS FOR COOKING

The campus uses commercial LPG cylinders and biogas for its cooking purpose. The biogas plant to treat food waste and the biogas thus generated can be used in kitchen. Installation of a solar water heater to rise the water temperature to a much higher level, then it has to consume only very less amount of thermal energy for preparing the same amount of food is another method. This can make a positive benefit to the campus by saving money, energy and can reduce the carbon emission of the campus due to thermal energy consumed for cooking.

TRANSPORTATION

Energy efficiency of the transportation sector is mainly depended on the fuel efficiency of the vehicles used. Here mileage of the vehicle (kmpl - Kilometres per Litre) is calculated to assess the fuel efficiency of the vehicle.

Percentage of closeness is the ratio of actual mileage of the vehicle to its expected mileage. If the percentage of closeness of mileages of each vehicle is greater than that of its average, then the efficiency status of the vehicle is considered as ‘Above average’ and else, it is considered as ‘Below average’

Carbon Mitigation Proposals

After analyzing the historical and measured data the following projects are proposed to make the campus carbon neutral. The projects are from energy efficiency and renewable energy. The further additions in the green cover increase will also give positive impact in the carbon mitigation.

OTTOTRACTIONS- ENERGY AUDIT						
St. Joseph's College of Pharmacy						
Greenhouse Gas Mitigation through Major Energy Efficiency Projects						
Sl No	Projects	Energy saved(Yearly)		Sustainability (Years)	First year ton of CO2 mitigated	Expected Tons of CO2 mitigated through out life cycle
		(kWh)	MWh	Years		
1	Energy Saving in Lighting by replacing existing 300 No's T8 (40W) Lamps to 18W LED Tube	4245	4.25	10	3.48	34.81
2	Energy Saving by replacing existing 600No's in-efficient ceiling fans with Energy Efficient Five star fans/BLDC Fans	12197	12.20	10	10.00	100.01
Total		**16442**	**16**	**20**	**13.48**	**135**

OTTOTRACTIONS- ENERGY AUDIT						
St. Joseph's College of Pharmacy						
Greenhouse Gas Mitigation through Renewable Energy Projects						
Sl No	Projects	Energy saved (Yearly)		Sustainability (Years)	First year ton of CO2 mitigated	Expected Tons of CO2 mitigated throughout life cycle
		(kWh)	MWh	Years		
1	Installation of 30 kWp Solar Power Plant	38325	38.33	25	31.43	785.66
	Total	38325	38	25	31	786

Executive Summary					
Consolidated Cost Benefit Analysis of Energy Efficiency Improvement Projects					
St. Joseph's College of Pharmacy					
Sl No	Projects	Investment	Cost saving	SPB	Energy saved
		(Lakhs Rs)	(Lakhs Rs)/Yr	Months	kWh/Yr
1	Energy Saving in Lighting by replacing existing 300 No's T8 (40W) Lamps to 18W LED Tube	0.75	0.382	23.56	4245
2	Energy Saving by replacing existing 600No's in-efficient ceiling fans with Energy Efficient Five star fans/BLDC Fans	15.00	1.012	177.81	12197
	Total	**15.75**	**1.39**	**100.68**	**16442**
(The saving are projected as per the assumed operation time observed based in the discussions with the plant officials. The data of saving percentages are taken from BEE guide books and field measurements.)					

5

CONCLUSION

The carbon emission from different sectors namely, Energy, Transportation and wastes were calculated using standard procedures. Carbon sequestration by the trees present in the campus was also estimated. From these the total carbon footprint of the campus was arrived at.

Net Carbon Emission after implementing Energy Efficiency projects and Renewable Energy Projects Proposed		
1	Total Carbon Foot Print tCO2e/yr	101.66
2	Carbon Sequestrated tCO2e/yr	1.13
3	Carbon mitigated by Renewable Energy tCO2e/yr (Installed)	70.63
3	Carbon mitigated by Renewable Energy tCO2e/yr (Proposed)	31.43
4	Carbon mitigated by Energy Efficiency (Proposed) tCO2e/yr	13.48
5	Effective Carbon footprint tCO2e/yr	-15.01
6	Total No of Students	439
7	Specific Carbon Footprint kg CO2e/Student/Yr	-34.19

From this study it was found that carbon footprint of the campus to be **–34.19** kgCO_2e/ Student/ Year in place of current footprint i.e., **65.45** kgCO_2e/ student/ Year. This will be achieved after implementing energy efficiency projects and implementation of 30kWp solar power plant. To achieve this an investment of **32.25 lakhs Rs** is required through energy efficiency and renewable energy projects proposed. It will be around **7346 Rs per student** to make the campus the carbon negative.

Cost to make the campus Carbon Negative		
1	Cost of implementation in Energy Efficiency Lakhs Rs	15.75
2	Cost of implementation in Renewable Energy Lakhs Rs	16.50
3	Total Lakhs Rs	32.25
4	Total number of students	439
5	Cost per student to make the campus carbon negative Rs/ Student	7346

REFERENCES

Reports and Books

- Towards campus climate neutrality: Simon Fraser University's carbon footprint (2007), Simon Fraser University, Bokowski, G., White, D., Pacifico, A., Talbot, S., DuBelko, A., Phipps, A.
- The bare necessities: How much household carbon do we really need? Ecological Economics (2010), 69, 1794–1804, Druckman, A., & Jackson, T.
- Home Energy Audit Manual (2017), Ottotractions & EMC Kerala, No.ES 26, Pp.114
- Screening of 37 Industrial PSUs in Kerala for Carbon Emission Reduction and CDM Benefits, (2011), Ottotractions & Directorate of Environment & climate Change, Kerala, No. ES-8, Pp.157

Website

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OTTOTRACTIONS
Energy-Engineering-Environment

6

TECHNICAL SUPPLEMENT

LIST OF TREES

Sl No	Name of Trees	No. of Trees
1	COCONUT TREE	95
2	JACK FRUIT TREE	2
3	SPANISH CHERRY (ILANJI)	2
4	MANGO TREE	29
5	TEAK	1
6	MAHOGONY TREE	60
7	PORITA TREE(POOVARASH)	1
8	ACACIA	31
9	INDIAN BAEL (KOOVALAM)	1
10	ASHOKA TREE	1
11	GUVA	30
12	INDIAN GOOSEBERRY	2
13	NEEM	1
14	LEMON	3
15	LARGE GARLIC PEAR (NEERMATHALAM)	1
16	DWARF WHITE ORCHID(MANDHAARAM)	5
17	SPEAR TREE (EETTI)	5
18	GAMHAR (KUMBIL)	3
19	INDIAN ASH TREE (UDHI)	3
20	INDIAN ALMOND (THALLI MARAM)	2
21	BANYAN TREE (AALMARAM)	1
22	YELLOW PALM	37
23	RED PALM	21
24	BAMBOO PALM	10
25	MALABAR IRON WOOD (THAMBAKAM)	2
26	RED SANDALWOOD (RAKTHA CHANDHANAM)	1
27	MALABAR TURMERIND (KUDAMPULI)	2
28	INDIAN COFFEE PLUM (LUBI)	1
29	ARKA (CHERUPUNNA)	1

KERALA STATE ELECTRICITY BOARD LIMITED

DEMAND CUM DISCONNECTION NOTICE

(As per Regulation 122 & 123 of Kerala Electricity Supply Code 2014)

Section	**[5512]-Electrical Section Cherthala**	**Phone#**	0478-2812504	**Customer Care**	1912
Consumer#	**1155126023569**	Reg. Mob# **996xxxx055**		**Regular CC Bill**	**KSEBL GSTIN: 32AAECK2277NBZ1**

Name & Mailing Address

ADMINISTARATOR

ST\\\\' JOSEPH PHARMACY COLLEGE, C M C.-2., CHE

RTHALA P.O, CHERTHALA

For redressing complaints/grievance approach the concerned CGRF

South: Chairperson,CGRF(South),KSEB Ltd, Vydythi Bhavanam,Kottarakkara-691506, Ph:0474-2060220

Central: Chairperson,CGRF(Central),KSEB Ltd, Power House Building Ernakulam-682018, Ph:0484-2394288

North: Chairperson,CGRF(North),KSEB Ltd,Gandhi Road,Kozhikode-32, Ph:0495-2367820

State Electricity Ombudsman, Pallikkavil Building,Mamangalam, Edappally, Kochi-682024 Ph:0484-2346488

Bill#	**5512221206858**	**Bill Area**	B01/18	**DTR**	ST JOSEPH
Billing Period	**12/2022**[Bi-Monthly]	**Tariff/Phase**	LT-7A/Single	**Pole#**	STJ/S/
Bill Date	**21-12-2022**	**Due Date**	**31-12-2022**	**DC Date**	**16-01-2023**
Contract Demand	**(Nil)** VA [75% : 0KV, 130% : 0KV]	**Connected Load**	860 Watts	**Security Deposit**	Rs.549.00

Meter#	L&T001010055349370	**Average consumption(Monthly)**	
Meter Digits	6.0	**Power Unit/Zone**	**CUMULATIVE**
Meter Type/Owner	TOD/KSEB	KWH	16

Last Billed Rdg. Date	**Prev. Rdg. Date**	**Prev. Meter Rdg. Status**	**Prst. Rdg. Date**	**Prst. Meter Rdg. Status**
21-10-2022	**21-10-2022**	**Working**	**21-12-2022**	**Working**

Power Unit	**Zone**	**Trading**	**Initial Reading(IR)**	**Final Reading(FR)**	**OMF**	**Units***
KWH	Cumulative	Import	990.00	1023.00	1	33

Remarks :

Last Paid Amount - Rs.394.00

Last Payment Date - 17-01-2023

Bill Details			**[INR] Amount(Rs.)**
a)	Fixed Charges	Fixed Charge[FC]	160.00
		Sub Total	**160.00**
b)	Energy Charges	Energy Charge[EC]	199.65
		Sub Total	**199.65**
c)	Other Charges	Electricity Duty[ED]	19.97
		Meter Rent[MR]	12.00
		Sub Total	**31.97**
d)	GST	MR-CGST	1.08
		MR-SGST	1.08
		Sub Total	**2.16**
e)	Round Off		0.22
f)	**Total Amt.(Bill#5512221206858)** *(a+b+c+d+e)*		**394.00**
g)	Surcharge		0.00
h)	Reconnection Fee		0.00
i)	Interim Bills		0.00
j)	Arrears		-0.00
k)	Less paid/adj.		-394.00
l)	Less Advance		-0.00
	Net Payable*(f+g+h+i+j-k-l)*		**0.00**

Demand for 12/2022 is Rupees Three Hundred and Ninety Four Only

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

Senior Superintendent

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KERALA STATE ELECTRICITY BOARD LIMITED

DEMAND CUM DISCONNECTION NOTICE

(As per Regulation 122 & 123 of Kerala Electricity Supply Code 2014)

Section	**[5512]-Electrical Section Cherthala**	**Phone#**	0478-2812504	**Customer Care**	1912
Consumer#	**1155127001836**	Reg. Mob# **996xxxx055**		**Regular CC Bill**	**KSEBL GSTIN: 32AAECK2277NBZ1**

Name & Mailing Address

THE ADMINISTRATOR

ST JOSEPH\\\\'S HOSPITAL, DHARMAGIRI, CHERTHALA

P O

For redressing complaints/grievance approach the concerned CGRF

South: Chairperson,CGRF(South),KSEB Ltd, Vydythi Bhavanam,Kottarakkara-691506, Ph:0474-2060220

Central: Chairperson,CGRF(Central),KSEB Ltd, Power House Building Ernakulam-682018, Ph:0484-2394288

North: Chairperson,CGRF(North),KSEB Ltd,Gandhi Road,Kozhikode-32, Ph:0495-2367820

State Electricity Ombudsman, Pallikkavil Building,Mamangalam, Edappally, Kochi-682024 Ph:0484-2346488

Bill#	**5512221206859**	**Bill Area**	B01/18	**DTR**	ST JOSEPH
Billing Period	**12/2022**[Bi-Monthly]	**Tariff/Phase**	LT-7A/Single	**Pole#**	STJ/S/
Bill Date	**21-12-2022**	**Due Date**	**31-12-2022**	**DC Date**	**16-01-2023**
Contract Demand	**(Nil)** VA [75% : 0KV, 130% : 0KV]	**Connected Load**	2200 Watts	**Security Deposit**	Rs.1800.00

Meter#	L&T00SCM0093228496	**Average consumption(Monthly)**	
Meter Digits	5.1	**Power Unit/Zone**	**CUMULATIVE**
Meter Type/Owner	TOD/KSEB	KWH	5

Last Billed Rdg. Date	**Prev. Rdg. Date**	**Prev. Meter Rdg. Status**	**Prst. Rdg. Date**	**Prst. Meter Rdg. Status**
21-10-2022	**21-10-2022**	**Working**	**21-12-2022**	**Working**

Power Unit	**Zone**	**Trading**	**Initial Reading(IR)**	**Final Reading(FR)**	**OMF**	**Units***
KWH	Cumulative	Import	1329.00	1422.00	1	93

Remarks :

Last Paid Amount - Rs.1113.00

Last Payment Date - 17-01-2023

Bill Details			**[INR] Amount(Rs.)**
a)	Fixed Charges	Fixed Charge[FC]	480.00
		Sub Total	**480.00**
b)	Energy Charges	Energy Charge[EC]	562.65
		Sub Total	**562.65**
c)	Other Charges	Electricity Duty[ED]	56.27
		Meter Rent[MR]	12.00
		Sub Total	**68.27**
d)	GST	MR-CGST	1.08
		MR-SGST	1.08
		Sub Total	**2.16**
e)	Round Off		-0.08
e)	**Total Amt.(Bill#5512221206859)** *(a+b+c+d+e)*		**1113.00**
f)	Surcharge		0.00
g)	Reconnection Fee		0.00
h)	Interim Bills		0.00
i)	Arrears		-0.00
j)	Less paid/adj.		-1113.00
k)	Less Advance		-0.00
	Net Payable*(e+f+g+h+i-j-k)*		**0.00**

Demand for 12/2022 is Rupees One Thousand One Hundred and Thirteen Only

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

Senior Superintendent

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KERALA STATE ELECTRICITY BOARD LIMITED

DEMAND CUM DISCONNECTION NOTICE

(As per Regulation 122 & 123 of Kerala Electricity Supply Code 2014)

Section	**[5512]-Electrical Section Cherthala**	**Phone#**	0478-2812504	**Customer Care**	1912
Consumer#	**1155127001759**	Reg. Mob# **808xxxx470**		**Regular CC Bill**	**KSEBL GSTIN: 32AAECK2277NBZ1**

Name & Mailing Address

ADMINISTRATER

ST JOSEPH HOSPITAL TRUST, CMC 2, CHERTHALA

For redressing complaints/grievance approach the concerned CGRF

South: Chairperson,CGRF(South),KSEB Ltd, Vydythi Bhavanam,Kottarakkara-691506, Ph:0474-2060220

Central: Chairperson,CGRF(Central),KSEB Ltd, Power House Building Ernakulam-682018, Ph:0484-2394288

North: Chairperson,CGRF(North),KSEB Ltd,Gandhi Road,Kozhikode-32, Ph:0495-2367820

State Electricity Ombudsman, Pallikkavil Building,Mamangalam, Edappally, Kochi-682024 Ph:0484-2346488

Bill#	**5512221206860**	**Bill Area**	B01/18	**DTR**	ST JOSEPH
Billing Period	**12/2022**[Bi-Monthly]	**Tariff/Phase**	LT-7A/Single	**Pole#**	STJ/S/
Bill Date	**21-12-2022**	**Due Date**	**31-12-2022**	**DC Date**	**16-01-2023**
Contract Demand	**(Nil)** VA [75% : 0KV, 130% : 0KV]	**Connected Load**	3514 Watts	**Security Deposit**	Rs.7332.00

Meter#	L&T0B9730099499454	**Average consumption(Monthly)**	
Meter Digits	6.2	**Power Unit/Zone**	**CUMULATIVE**
Meter Type/Owner	LCD/KSEB	KWH	140

Last Billed Rdg. Date	**Prev. Rdg. Date**	**Prev. Meter Rdg. Status**	**Prst. Rdg. Date**	**Prst. Meter Rdg. Status**
21-10-2022	**21-10-2022**	**Working**	**21-12-2022**	**Working**

Power Unit	**Zone**	**Trading**	**Initial Reading(IR)**	**Final Reading(FR)**	**OMF**	**Units***
KWH	Cumulative	Import	1268.00	1744.00	1	476

Remarks :

Last Paid Amount - Rs.4581.00

Last Payment Date - 17-01-2023

Bill Details			**[INR] Amount(Rs.)**
a)	Fixed Charges	Fixed Charge[FC]	640.00
		Sub Total	**640.00**
b)	Energy Charges	Energy Charge[EC]	3570.00
		Sub Total	**3570.00**
c)	Other Charges	Electricity Duty[ED]	357.00
		Meter Rent[MR]	12.00
		Sub Total	**369.00**
d)	GST	MR-CGST	1.08
		MR-SGST	1.08
		Sub Total	**2.16**
e)	Round Off		-0.16
e)	**Total Amt.(Bill#5512221206860)** *(a+b+c+d+e)*		**4581.00**
f)	Surcharge		0.00
g)	Reconnection Fee		0.00
h)	Interim Bills		0.00
i)	Arrears		0.00
j)	Less paid/adj.		-4581.00
k)	Less Advance		-0.00
	Net Payable*(e+f+g+h+i-j-k)*		**0.00**

Demand for 12/2022 is Rupees Four Thousand Five Hundred and Eighty One Only

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

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KERALA STATE ELECTRICITY BOARD LIMITED

DEMAND CUM DISCONNECTION NOTICE

(As per Regulation 122 & 123 of Kerala Electricity Supply Code 2014)

Section	**[5512]-Electrical Section Cherthala**	**Phone#**	0478-2812504	**Customer Care**	1912
Consumer#	**1155120024402**	Reg. Mob# **974xxxx668**		**Regular CC Bill**	**KSEBL GSTIN: 32AAECK2277NBZ1**

Name & Mailing Address

ADMINISTRATOR

ST.JOSEPHS COLLEGE OF FHARMACY, DHARMAGIRI COLLEGE, CHERTHALA PO, NAIPUNNIYA COLLEGE NEAR

For redressing complaints/grievance approach the concerned CGRF

South: Chairperson,CGRF(South),KSEB Ltd, Vydythi Bhavanam,Kottarakkara-691506, Ph:0474-2060220

Central: Chairperson,CGRF(Central),KSEB Ltd, Power House Building Ernakulam-682018, Ph:0484-2394288

North: Chairperson,CGRF(North),KSEB Ltd,Gandhi Road,Kozhikode-32, Ph:0495-2367820

State Electricity Ombudsman, Pallikkavil Building,Mamangalam, Edappally, Kochi-682024 Ph:0484-2346488

Bill#	**5512221206861**	**Bill Area**	B01/18	**DTR**	ST JOSEPH
Billing Period	**12/2022**[Bi-Monthly]	**Tariff/Phase**	LT-6F/Three	**Pole#**	STJ/S/1
Bill Date	**21-12-2022**	**Due Date**	**31-12-2022**	**DC Date**	**16-01-2023**
Contract Demand	**(Nil)** VA [75% : 0KV, 130% : 0KV]	**Connected Load**	7346 Watts	**Security Deposit**	Rs.12087.00

Meter#	L+G020190004912720	**Average consumption(Monthly)**	
Meter Digits	5.1	**Power Unit/Zone**	**CUMULATIVE**
Meter Type/Owner	TOD/KSEB	KWH	178

Last Billed Rdg. Date	**Prev. Rdg. Date**	**Prev. Meter Rdg. Status**	**Prst. Rdg. Date**	**Prst. Meter Rdg. Status**
21-10-2022	**21-10-2022**	**Working**	**21-12-2022**	**Working**

Power Unit	**Zone**	**Trading**	**Initial Reading(IR)**	**Final Reading(FR)**	**OMF**	**Units***
KWH	Cumulative	Import	9973.00	10029.00	1	56

Remarks :

Last Paid Amount - Rs.3125.00

Last Payment Date - 17-01-2023

Bill Details			**[INR] Amount(Rs.)**
a)	Fixed Charges	Fixed Charge[FC]	2720.00
		Sub Total	**2720.00**
b)	Energy Charges	Energy Charge[EC]	336.00
		Sub Total	**336.00**
c)	Other Charges	Electricity Duty[ED]	33.60
		Meter Rent[MR]	30.00
		Sub Total	**63.60**
d)	GST	MR-CGST	2.70
		MR-SGST	2.70
		Sub Total	**5.40**
e)	**Total Amt.(Bill#5512221206861)** *(a+b+c+d)*		**3125.00**
f)	Surcharge		0.00
g)	Reconnection Fee		0.00
h)	Interim Bills		0.00
i)	Arrears		0.00
j)	Less paid/adj.		-3125.00
k)	Less Advance		-0.00
	Net Payable*(e+f+g+h+i-j-k)*		**0.00**

Demand for 12/2022 is Rupees Three Thousand One Hundred and Twenty Five Only

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

Senior Superintendent

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KERALA STATE ELECTRICITY BOARD LIMITED

DEMAND CUM DISCONNECTION NOTICE

(As per Regulation 122 & 123 of Kerala Electricity Supply Code 2014)

Section	**[5512]-Electrical Section Cherthala**	**Phone#**	0478-2812504	**Customer Care**	1912
Consumer#	**1155121023494**	Reg. Mob# **808xxxx470**		**Regular CC Bill**	**KSEBL GSTIN: 32AAECK2277NBZ1**

Name & Mailing Address

SR.JOVANA

ADMNISTRATOR,ST.JOSEPH COLLEGE OF PHARMACY, C

MC-2/28G, NEW BLOCK, NEAR NAIPUNYA COLLEGE

For redressing complaints/grievance approach the concerned CGRF

South: Chairperson,CGRF(South),KSEB Ltd, Vydythi Bhavanam,Kottarakkara-691506, Ph:0474-2060220

Central: Chairperson,CGRF(Central),KSEB Ltd, Power House Building Ernakulam-682018, Ph:0484-2394288

North: Chairperson,CGRF(North),KSEB Ltd,Gandhi Road,Kozhikode-32, Ph:0495-2367820

State Electricity Ombudsman, Pallikkavil Building,Mamangalam, Edappally, Kochi-682024 Ph:0484-2346488

Bill#	**5512230100140**	**Bill Area**	M02/2	**DTR**	ST JOSEPH
Billing Period	**1/2023**[Monthly]	**Tariff/Phase**	LT-7A/Three	**Pole#**	STJ/S/
Bill Date	**03-01-2023**	**Due Date**	**13-01-2023**	**DC Date**	**28-01-2023**
Contract Demand	**(Nil)** VA [75% : 0KV, 130% : 0KV]	**Connected Load**	14700 Watts	**Security Deposit**	Rs.9038.00

Meter#	L&T00SCM0018438385	**Average consumption(Monthly)**	
Meter Digits	6.1	**Power Unit/Zone**	**CUMULATIVE**
Meter Type/Owner	TOD/KSEB	KWH	232

Last Billed Rdg. Date	**Prev. Rdg. Date**	**Prev. Meter Rdg. Status**	**Prst. Rdg. Date**	**Prst. Meter Rdg. Status**
01-12-2022	**01-12-2022**	**Working**	**03-01-2023**	**Working**

Power Unit	**Zone**	**Trading**	**Initial Reading(IR)**	**Final Reading(FR)**	**OMF**	**Units***
KWH	Cumulative	Import	10600.00	10812.00	1	212

Remarks :

Last Paid Amount - Rs.4174.00

Last Payment Date - 17-01-2023

	Bill Details		**[INR] Amount(Rs.)**
a)	Fixed Charges	Fixed Charge[FC]	2400.00
		Sub Total	**2400.00**
b)	Energy Charges	Energy Charge[EC]	1590.00
		Sub Total	**1590.00**
c)	Other Charges	Electricity Duty[ED]	159.00
		Meter Rent[MR]	15.00
		Sub Total	**174.00**
d)	GST	MR-CGST	1.35
		MR-SGST	1.35
		Sub Total	**2.70**
e)	Round Off		0.30
f)	**Total Amt.(Bill#5512230100140)** *(a+b+c+d+e)*		**4167.00**
g)	Surcharge		7.00
h)	Reconnection Fee		0.00
i)	Interim Bills		0.00
j)	Arrears		0.00
k)	Less paid/adj.		-4174.00
l)	Less Advance		-0.00
	Net Payable*(f+g+h+i+j-k-l)*		**0.00**

Demand for 1/2023 is Rupees Four Thousand One Hundred and Sixty Seven Only

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

Senior Superintendent

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KERALA STATE ELECTRICITY BOARD LIMITED

DEMAND CUM DISCONNECTION NOTICE

(As per Regulation 122 & 123 of Kerala Electricity Supply Code 2014)

Section	**[5512]-Electrical Section Cherthala**	**Phone#**	0478-2812504	**Customer Care**	1912
Consumer#	**1155127024177**	Reg. Mob# **944xxxx570**		**Regular CC Bill**	**KSEBL GSTIN: 32AAECK2277NBZ1**

Name & Mailing Address

ADMINISTATOR

ST.JOSEPH COLLEGE DHARMAGIRI, CMC 30, NORTH O

F IRUVELY BRIDGE, CHERTHALA

For redressing complaints/grievance approach the concerned CGRF

South: Chairperson,CGRF(South),KSEB Ltd, Vydythi Bhavanam,Kottarakkara-691506, Ph:0474-2060220

Central: Chairperson,CGRF(Central),KSEB Ltd, Power House Building Ernakulam-682018, Ph:0484-2394288

North: Chairperson,CGRF(North),KSEB Ltd,Gandhi Road,Kozhikode-32, Ph:0495-2367820

State Electricity Ombudsman, Pallikkavil Building,Mamangalam, Edappally, Kochi-682024 Ph:0484-2346488

Bill#	**5512230100166**	**Bill Area**	M02/4	**DTR**	ST JOSEPH
Billing Period	**1/2023**[Monthly]	**Tariff/Phase**	LT-6F/Three	**Pole#**	STJ/S/1
Bill Date	**03-01-2023**	**Due Date**	**13-01-2023**	**DC Date**	**28-01-2023**
Contract Demand	**(Nil)** VA [75% : 0KV, 130% : 0KV]	**Connected Load**	16519 Watts	**Security Deposit**	Rs.22437.00

Meter#	GPI0CUST00A4535320	**Average consumption(Monthly)**	
Meter Digits	6.2	**Power Unit/Zone**	**CUMULATIVE**
Meter Type/Owner	NET Meter/Customer	KWH	1600

Last Billed Rdg. Date	Prev. Rdg. Date	Prev. Meter Rdg. Status	Prst. Rdg. Date	Prst. Meter Rdg. Status
03-12-2022	**03-12-2022**	**Working**	**03-01-2023**	**Working**

Power Unit	Zone	Trading	Initial Reading(IR)	Final Reading(FR)	OMF	Units*
KWH	Cumulative	Import	14309.00	15154.00	1	845
KWH	Cumulative	Export	18075.00	19379.00	1	1304

Remarks :

Last Paid Amount - Rs.2913.00

Last Payment Date - 17-01-2023

Solar Generation

Description	Date	Zone	Tr.	IR	FR	MF	Units
Regular Reading Point	03-01-2023	WAL	I	24535.00	26196.00	1	1661

	Bill Details		**[INR] Amount(Rs.)**
a)	Fixed Charges	Fixed Charge[FC]	2890.00
		Sub Total	**2890.00**
		Sub Total	**0.00**
c)	Other Charges	ED[Self Generation]	19.93
		Sub Total	**19.93**
		Sub Total	**0.00**
e)	Round Off		0.07
f)	**Total Amt.(Bill#5512230100166)** *(a+c+e)*		**2910.00**
g)	Surcharge		3.00
h)	Reconnection Fee		0.00
i)	Interim Bills		0.00
j)	Arrears		0.00
k)	Less paid/adj.		-2913.00
l)	Less Advance		-0.00
	Net Payable*(f+g+h+i+j-k-l)*		**0.00**

Demand for 1/2023 is Rupees Two Thousand Nine Hundred and Ten Only

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

Senior Superintendent

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Solar OnGrid Consumer (Generator)

Consumer No.	1155127024177	Consumer Name	ADMINISTATOR
SPIN	551200017	Plant Capacity	15 KW
Grid Connected On	01-09-2021		

Bank Statement for 202301 (Generator)

Units Imported	845 kWh	Units Exported	1304 kWh
Bank Opening	1029	Billed Consumption	0 kWh
Bank Closing	1488		

Consumption Adjustment Report

Bill Month	Consumer #	Zone Code	Import	Export	Export + Bank	Solar Energy (Bank Energy X Factor)	Adjusted from bank	Billed Cons.	Banked Balance
202301	24177	A	845	1304	2333	2333	845	0	1488

FACTOR : 0-Reading Not Accepted/Door Lock 0.9415-Applying Wheeling Charges 1/0.9415-Resetting Wheeling Charges

KERALA STATE ELECTRICITY BOARD LIMITED

DEMAND CUM DISCONNECTION NOTICE

(As per Regulation 122 & 123 of Kerala Electricity Supply Code 2014)

Section	**[5512]-Electrical Section Cherthala**	**Phone#**	0478-2812504	**Customer Care**	1912
Consumer#	**1155127020395**	Reg. Mob# **996xxxx055**		**Regular CC Bill**	**KSEBL GSTIN: 32AAECK2277NBZ1**

Name & Mailing Address

MOTHER SUPERIOR

ST JOSEPH PHARMACY COLLEGE, CMC 2, NORTH WEST OF ERUVELI BRIDGE/ /NRC NO CW 4626, CHERTHAL A NORTH

For redressing complaints/grievance approach the concerned CGRF

South: Chairperson,CGRF(South),KSEB Ltd, Vydythi Bhavanam,Kottarakkara-691506, Ph:0474-2060220

Central: Chairperson,CGRF(Central),KSEB Ltd, Power House Building Ernakulam-682018, Ph:0484-2394288

North: Chairperson,CGRF(North),KSEB Ltd,Gandhi Road,Kozhikode-32, Ph:0495-2367820

State Electricity Ombudsman, Pallikkavil Building,Mamangalam, Edappally, Kochi-682024 Ph:0484-2346488

Bill#	**5512230100167**	**Bill Area**	M02/4	**DTR**	ST JOSEPH
Billing Period	**1/2023**[Monthly]	**Tariff/Phase**	LT-6F/Three	**Pole#**	STJ/S/
Bill Date	**03-01-2023**	**Due Date**	**13-01-2023**	**DC Date**	**28-01-2023**
Contract Demand	**(Nil)** VA [75% : 0KV, 130% : 0KV]	**Connected Load**	37860 Watts	**Security Deposit**	Rs.45900.00

Meter#	SCM020180000819403	**Average consumption(Monthly)**	
Meter Digits	6.1	**Power Unit/Zone**	**CUMULATIVE**
Meter Type/Owner	NET Meter/Customer	KWH	744

Last Billed Rdg. Date	Prev. Rdg. Date	Prev. Meter Rdg. Status	Prst. Rdg. Date	Prst. Meter Rdg. Status
03-12-2022	**03-12-2022**	**Working**	**03-01-2023**	**Working**

Power Unit	Zone	Trading	Initial Reading(IR)	Final Reading(FR)	OMF	Units*
KWH	Cumulative	Import	40052.00	40839.00	1	787
KWH	Cumulative	Export	8396.00	8603.00	1	207

Remarks :

Arrears(Disputed) : Rs.146894/-

Last Paid Amount - Rs.12385.00

Last Payment Date - 17-01-2023

Solar Generation

Description	Date	Zone	Tr.	IR	FR	MF	Units
Regular Reading Point	03-01-2023	WAL	I	33323.00	34121.00	1	798

	Bill Details		[INR] Amount(Rs.)
a)	Fixed Charges	Fixed Charge[FC]	6460.00
		Sub Total	**6460.00**
b)	Energy Charges	Energy Charge[EC]	5365.00
		Sub Total	**5365.00**
c)	Other Charges	Electricity Duty[ED]	536.50
		ED[Self Generation]	9.58
		Sub Total	**546.08**
		Sub Total	**0.00**
e)	Round Off		-0.08
e)	**Total Amt.(Bill#5512230100167)** *(a+b+c+e)*		**12371.00**
f)	Surcharge		14.00
g)	Reconnection Fee		0.00
h)	Interim Bills		0.00
i)	Arrears		0.00
j)	Less paid/adj.		-12385.00
k)	Less Advance		-0.00
	Net Payable*(e+f+g+h+i-j-k)*		**0.00**

Demand for 1/2023 is Rupees Twelve Thousand Three Hundred and Seventy One Only

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

Senior Superintendent

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Solar OnGrid Consumer (Generator)

Consumer No.	1155127020395	Consumer Name	MOTHER SUPERIOR
SPIN	551200002	Plant Capacity	10 KW
Grid Connected On	14-11-2018		

Bank Statement for 202301 (Generator)

Units Imported	787 kWh	Units Exported	207 kWh
Bank Opening	0	Billed Consumption	580 kWh
Bank Closing	0		

Consumption Adjustment Report

Bill Month	Consumer #	Zone Code	Import	Export	Export + Bank	Solar Energy (Bank Energy X Factor)	Adjusted from bank	Billed Cons.	Banked Balance
202301	20395	A	787	207	207	207	207	580	0

FACTOR : 0-Reading Not Accepted/Door Lock 0.9415-Applying Wheeling Charges 1/0.9415-Resetting Wheeling Charges