ENERGY AUDIT REPORT

SN TRAINING COLLEGE, NEDUNGANDA

THIRUVANANTHAPURAM, KERALA

JANUARY 2023

Energy Management Centre – Kerala
Dept of Power, Govt of Kerala.
State Designated Agency
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ENERGY AUDIT AT

SN TRAINING COLLEGE, NEDUNGANDA
THIRUVANANTHAPURAM, KERALA

Conducted By

ENERGY MANAGEMENT CENTRE – KERALA
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ACKNOWLEDGMENT

We, hereby express sincere thanks and gratitude to **Smt. Dr. Sheeba P, Principal, Sree Narayan Training College Nedunganda, Varkala** for the wholehearted support, extended for the Energy Audit. Also, sincere thanks to **Smt. Dr. Sangeetha. N.R. Coordinator,IQAC, Smt. Dr. Viji. V, Assistant Professor** and **Smt. Dr. Dhanya B Chandran, Assistant Professor** for their co- operation and the needful assistance, extended to us, during the conduct of the Energy Audit.

Energy Management Centre(EMC)-Kerala has entrusted **M/s. Indira Babu Energy Ventures Pvt. Ltd, (Vydyuthi Energy Services),** the work of conducting an Energy Audit, at SN Training College, Nedunganda, Thiruvananthapuram

The Energy Audit was carried out by the following energy audit team of Vydyuthi Energy Services.

1. Er. Sudha Kumari. R (BEE Certified Energy Auditor), Head of Energy Efficiency
2. Dr. Vani Vijay, Technology & Research expert
3. Er. Kokila Vijayakumar, Operations & Data analytics consultant
4. Er. Akhil Dev D.J, Energy & Market Analyst
5. Er. Lino Lalachan, Electrical Specialist

Director

Energy Management Centre

Thiruvananthapuram
19.01.2023

Certification

This is to certify that

The data collection has been carried out diligently and truthfully; All data monitoring devices are in good working condition and have been calibrated or certified by approved agencies authorised and no tampering of such devices has occurred; All reasonable professional skill, care and diligence had been taken in preparing the energy audit report and the contents thereof are a true representation of the facts; Adequate training provided to 5 persons on relevant topics such as best energy efficiency practices for energy efficient lighting system, ventilation and HVAC system, Solar energy integration potential, and Healthy generator operations and maintenance; and The energy audit has been carried out in accordance with the Bureau of Energy Efficiency (Manner and Intervals of Time for the Conduct of Energy Audit) Regulations, 2010.

Sd/-

Sudha Kumari R

Certified Energy Auditor

Contents

Basic details – SN Training College, Nedunganda, Thiruvananthapuram

Sl. No	Items	Details
1	Name of the building	SN Training College, Nedunganda, Thiruvananthapuram
2	Category/Type of building (Govt. Office, Hospital, LSGD etc.)	Educational Institution
3	Name of the Assembly Constituency with District	Attingal Thiruvananthapuram
4	Address with phone number and e-mail ID	Nedunganda, Varkala, Thiruvananthapuram, Kerala 695307
5	Name of the Contact Person with Contact details	Dr. Sheeba P Principal
6	Energy audit last conducted (Year)	Not conducted
7	Name of the audit firm	NIL
8	Number of Government offices/Departments	
9	Number of Students	200
10	Number of Staff	22
11	No of Working Hours/day	6
12	No of Working days/Year	220
13	Staff Canteen/Restaurant	NIL
14	Scope for renewable energy integration	yes
15	Roof type (Concrete, MP Tiles etc)	concrete
16	Roof – Shape (Flat/ Sloping roof)	Flat
17	Roof Area (Sq. M)	
18	Reflective coating on roof (Y/N)	
19	Type of Glazing used in windows (Single Glazed/Double Glazed Window)	Single glazed
20	Whether UPS is placed inside an air conditioner room (Y/N)	No

21	Is false ceiling provided in air conditioned area? (Y/N)	No
22	Automatic Lighting Controls (Y/N)	No

Basic Energy Details: SN Training College, Nedunganda, Thiruvananthapuram

Sl. No	Items	2021-22
1	Name of the building	SN Training College, Nedunganda, Thiruvananthapuram
2	KSEBL Consumer No:	1145258017079 1145254014593 1145255023011
3	KSEBL Section Office	Varkala section
4	Connected Load (kW)	1145258017079: 14.32kW 1145254014593: 2kW 1145255023011: 7.685kW
5	Contract Demand (kVA)	
6	Recorded Average Maximum Demand (kVA)	Nil
7	Total Transformer Capacity (kVA)	Nil
8	Average Power Factor	Not Available
9	Air Conditioned area (Sq.M)	Not Available
a	Less than 50%	Yes
b	More than 50%	-
10	Annual electricity consumption of the building (kWh)	5917
11	Total built up area of the building (Sq. M)	2589.51
12	Specific Energy Consumption (kWh/Sq.m)	2.28
13	Water Source (Open well/KWA)	Open well & kWA
14	Water consumption KWA per year (kL)	414
15	Annual Water bill (KWA) Rs.	Nil
16	Number of vehicles – 4 wheeler (Own)	Nil
17	Number of vehicles – 4 wheeler (Contract)	Nil
18	Number of vehicles (2 Wheeler)	Nil
19	Total Diesel/Petrol consumption of the vehicles	Nil
20	Number of electric vehicles (if any)	Nil
21	Renewable Energy (Solar PV – kWp) – Installed Capacity	5kWp
22	Renewable Energy (Bio gas plant – Cub. M)	-
23	Present status of the RE system (Working or Not) if any	NIL
24	Own Diesel Generator (kVA)	NIL
25	Annual Diesel Consumption for DG (Lts)	NIL

1. Executive Summary

Table 1.a. Retrofitting in College buildings
(Consumer no. 1145254014593, connected load- 2kW)]

Sl. No	Description of Work	Annual Energy Saving Potential (kWh)	Annual Financial Savings (Rs.)	Investment Required (Rs.)	Payback Period (Years)
1	Retrofitting of 52W (T12) ordinary tube light with 18W LED tube light	209	1443	5600	3.9
2	Retrofitting of 36W (T8) ordinary tube light with 18W LED tube light	48	327	2400	7.3
3	Retrofitting of 60W ICL with 7W LED Bulb	34	232	160	0.7
4	Retrofitting of existing inefficient ceiling fan with BEE star rated (BLDC) ceiling fan	1523	10496	102000	9.7
	Total	**1814**	**12498**	**110160**	**8.8**

Energy saving potential of about 1814kWh per year, with an Annual financial savings of Rs. 12498(approx.). Investment required is about Rs. 110160

Table 1.b. Retrofitting in Main Block
(Consumer no. 1145258017079, connected load- 14.32kW)]

Sl. No	Description of Work	Annual Energy Saving Potential (kWh)	Annual Financial Savings (Rs.)	Investment Required (Rs.)	Payback Period (Years)
1	Retrofitting of 52W (T12) ordinary tube light with 18W LED tube light	254	3173	6800	2.1
2	Retrofitting of 36W (T8) ordinary tube light with 18W LED tube light	277.2	3458	14000	4.0
3	Retrofitting of 14W CFL with 7W LED Bulb	40	494	2880	5.8
4	Retrofitting of existing inefficient ceiling fan with BEE star rated (BLDC) ceiling fan	1352	16864	144000	8.5
	Total	**1923**	**23989**	**167680**	**7.0**

Energy saving potential of about 1923kWh per year, with an Annual financial savings of Rs. 23989(approx.). Investment required is about Rs. 167680

2. Introduction

2.1. Energy Management Centre (EMC) – Kerala

Energy Management Centre (EMC) – Kerala under Department of Power, Government of Kerala, is working towards attaining energy efficiency in all sectors of economy. EMC is formulating and implementing energy conservation projects and programs. In compliance with the Energy Conservation Act - 2001, Government of Kerala has designated EMC as the State Designated Agency (SDA) to enforce, regulate and co-ordinate the activities of Energy Conservation Act. Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India is the coordinating agency to implement the Act in the country. EMC is working very closely with Bureau of Energy Efficiency, Government of India and all the stake holders in initiating and implementing energy efficiency measures in the State.

With intention to enhance the energy efficiency of the various sectors of the economy EMC have envisaged various programs. To enhance energy conservation and energy efficiency of Low tension (LT) consumers a preliminary LT energy audit has been designed as a walk through energy audit.

Energy Management Centre (EMC) – Kerala has entrusted M/s. Indira Babu Energy Ventures Pvt Ltd for conducting an energy audit at SN Training College, Nedunganda, Thiruvananthapuram.

Major Activities of EMC

1. Monitoring and Verification of Energy Data of Designated Consumers and their PAT Scheme.
2. Mandatory Energy Audit for HT & EHT Consumers
3. Energy Efficiency training programme at Industrial Clusters/Parks/Estates
4. Energy Conservation Building Code (ECBC)
5. Energy Efficient Street Lighting
6. Municipal Demand Side Management (MuDSM)
7. Agriculture Demand Side Management (AgDSM).
8. Go-Electric Campaign
9. Urjayan Scheme for Legislative Assembly constituencies.
10. Energy Meter Calibration & LED Testing Lab
11. Kerala State Energy Conservation Award
12. Smart Energy Program for Students
13. Energy Efficiency Capacity Building Program
14. Urjakiran - Awareness programs for general public
15. Energy Clinic
16. Research & Studies

2.2. Vydyuthi Energy Services (VES)

Vydyuthi Energy Services (VES) under Indira Babu Energy Ventures Pvt. Ltd, located in Kerala, India with services focused on energy sector. VES helps businesses and organizations across sectors to identify energy efficiency drivers and enable them to adopt viable action plans.

VES is empaneled as Energy Auditing Firm under Energy Management Centre Government of Kerala with Empanelment No: EMCEEA-4720E

VES works with the vision of supporting the economy in achieving the Sustainable Development Goals (SDG) target by 2030. The important focus of the activities is to Enhance awareness, acceptability and applicability of energy efficiency and renewable energy technologies and provide energy services to build a sustainable future for generations to come Other than energy auditing, VES offers consulting, training, project management services and R&D in the below areas for businesses in India and abroad

- Energy Efficiency
- Renewable Energy
- Power Quality assessment
- E-Mobility
- Carbon Accounting.

2.3. SN Training College, Nedunganda

Sree Narayana Training College, Nedunganda is a pioneer educational institution in the field of Teacher Education. The college was established six decades ago in 1958 by Sri. R. Sankar in the name of the Great Visionary Spirit Sree Narayana Guru. The College is located at Nedunganda, a beautiful place near Varkala. The location is known for its serenity and calmness. The locality is hallmarked by the frequent presence of Sree Narayana Guru and Mahakavi Kumaranasan physically once and spiritually forever. The College is a well-established Teacher Education Institution contributing to the Society and Nation. It is affiliated to the University of Kerala and accredited by NAAC.

Data regarding connected loads and usage pattern, were identified during the Energy Audit and preliminary survey on 19.01.2023. The basic details are shown in below tables 2.3.1, 2.3.2.

Table 2.3.1: Details of built up area

Block	Built up Area in m^2
SN Training College, Nedunganda	2589.51

Table 2.3.2: Details Occupants

Category	in Number
Students	200
Teachers	16
Non-Teaching Staff	6
Total	**222**

3. Energy & Utility Description

Electricity supply provider: Kerala State Electricity Board. Bill details are as shown below

Consumer No.: 1145254014593	
Buildings	Office Building
Name of Consumer	The Principal, SN Training College
Connected Load	2kW
Measured Connected Load	10.82kW
Tariff	LT-6A Ndom
Annual Energy Consumption	3832kWh
Name of Section Office	Electrical Section Varkala

Sl. No	Consumption (Month)	Consumption (kWh)	Monthly Average Consumption (kWh)	Energy Charge (Rs.)
1	Jan 2023	576	446	3340

Consumer No.:1145258017079	
Buildings	Main Block
Name of Consumer	The Principal, SN Training College
Connected Load	14.32kW
Measured Connected Load	15.06kW
Tariff	LT-6A/Three
Annual Energy Consumption	3692kWh
Name of Section Office	Electrical Section Varkala

Sl. No	Consumption (Month)	Consumption (kWh)	Monthly Average Consumption (kWh)	Energy Charge (Rs.)
1	Jan 2023	276	500	179

Consumer No.: 1145255023011	
Buildings	Hostel
Name of Consumer	The Principal, SN Training College
Connected Load	7.685kW
Measured Connected Load	3.479kW
Tariff	LT-6F/Three
Name of Section Office	Electrical Section Varkala

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. Fans used are of ordinary inefficient type. Electronic fan regulators are used, which are energy efficient. Old fan regulators are also used, which are not energy efficient. The details of each appliance, in terms of location and numbers along with load details are provided in Annexure 1 of this document. The contribution

of each category of appliance to total connected load is shown in images 3.a for building and energy consumption is shown in image 3.b.The percentage of lighting and ventilation load in each area are shown in image 3.C

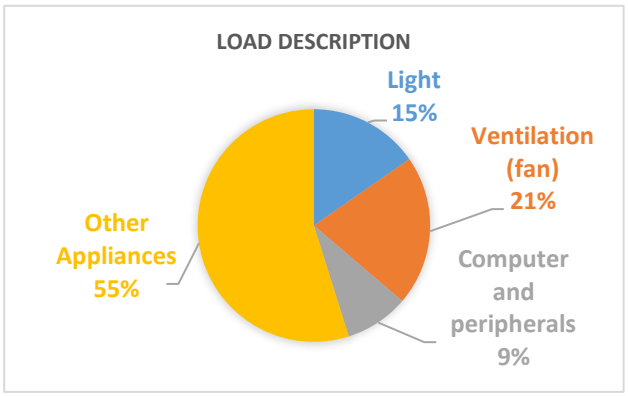


Image 3.a: Load Distribution
(Consumer No.: 1145254014593)
Measured Connected Load: 10.802kW

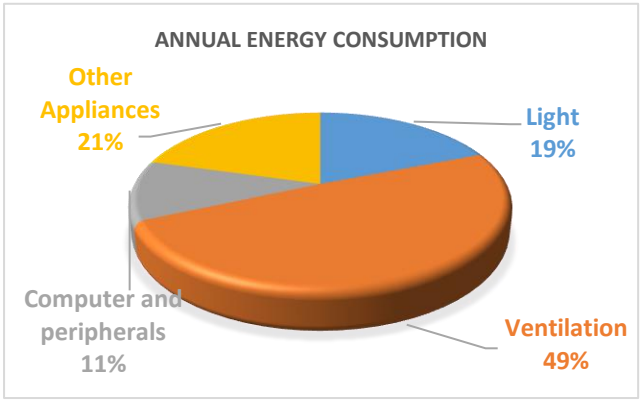


Image 3.b: Annual energy consumption
(Consumer No.: 1145254014593)
Estimated Annual Energy Consumption: 3832kWh

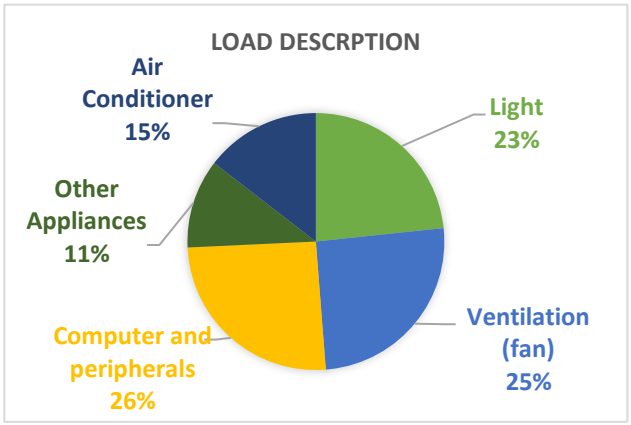


Image 3.c: Load Distribution
(Consumer No.: 1145258017079)
Measured Connected Load: 15.06kW

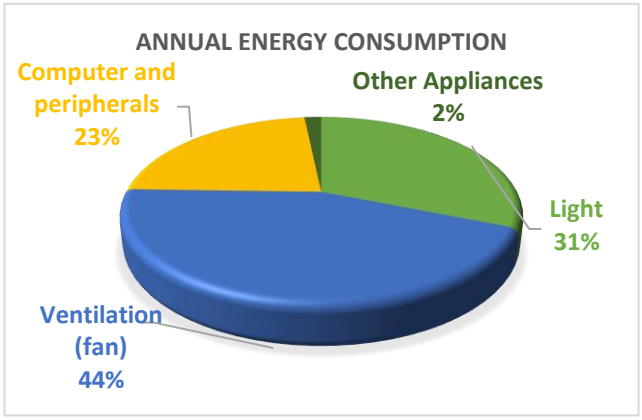


Image 3.d: Annual energy consumption
(Consumer No.: 1145258017079)
Estimated Annual Energy Consumption: 3692kWh

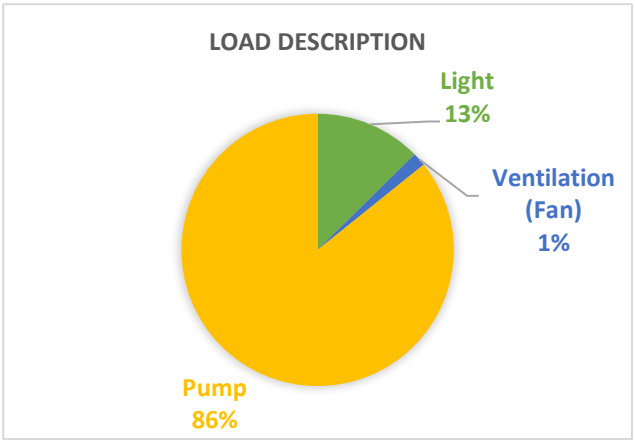


Image 3.e: Load Distribution
(Consumer No.: 1145255023011)
Measured Connected Load: 15.06kW

Image 3.e : Meter Board

Consumer No.: 1145254014593

Image 3.f : Meter Board

Consumer No.: 1145258017079

Image 3.g : 5kWp solar power plant installed in college premises

Image 3.h: Ongrid inverter

Lux level

Sl no	Location	Lux Level
	Office Block	
1	Office Room	222
2	Principal Room	139
	Golden Jubilee Block (UGC)	
3	Med Class No.1	110
4	Med Class No.2	87
5	M.ed Tutorial	97
	Main Block	
	Ground Floor	
6	Dept of Malayalam	133
	First Floor	
7	Natural Science	90

4. Energy Performance

The details of calculated approximate annual energy consumption of various loads, are shown in tables 4.a. From the pie charts in images 3.b and 3.d, it can be seen that major energy consumption are by ventilation (Fan), lighting load and Computer and peripherals. The existing inefficient T12 & T8 fluorescent tube lights can be replaced with LED lights. Inefficient CFL can be replaced with LED bulbs. The fans used are of ordinary inefficient types and these can be retrofitted with BEE Star labelled ceiling fans (BLDC)

Table 4.a: Estimated Annual energy consumption-Equipment wise (Consumer No.: 1145254014593)

Load Description	Annual Energy Consumption in kWh	Percentage of Annual Energy Consumption
Light	727	19%
Ventilation (fan)	1892	49%
Computer and peripherals	422	11%
Other Appliances	791	21%
Total	**3832**	**100%**

Table 4.b: Estimated Annual energy consumption-Equipment wise (Consumer No.: 1145258017079)

Load Description	Annual Energy Consumption in kWh	Percentage of Annual Energy Consumption
Light	1149	31%
Ventilation (fan)	1637	44%
Computer and peripherals	845	23%
Other Appliances	61	2%
Total	**3692**	**100%**

Table 4.b: Annual Energy Consumption

Petrol Generator in the college campus	5kVA
Annual Petrol Consumption in Ltrs.	10

Table 4.c: Energy Performance details

Description	Value
Total Annual Energy Consumption as per KSEB bills in kWh	5917
Total built up area in m2	2589.51
Specific Energy Consumption kWh/m2	2.28

5. 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.

CO_2 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 = 5917kWh/Year
- CO_2 emission by electricity consumption by the campus= 4674.43Kg

CO_2 emissions due to Petrol use [kg]

= emission factor [2.3kg/Ltr] X petrol used [Ltr]

- CO_2 emission by petrol use by the campus= 23Kg

The CO2 emission and there by impact on environment and climate can be reduced by implementing the energy saving recommendations and utilizing more renewable energy sources.

6. Recommendations for Energy Conservation

Consumer No: 1145258017079, connected load: 15.06 kW

Calculation Table: Light Load			
Description	**Name of equipment**		
	T12	**T8**	**CFL**
Annual working hours (Average Hrs)	440	440	440
No. of fittings(nos.)	17	40	27
Wattage of one light fitting(kW)	0.052	0.036	0.014
Total load(kW)	0.884	1.44	0.378
Annual Energy Consumption(kWh)	388.96	633.6	166.32
Wattage of one retrofitting light fitting (kW)	0.018	0.018	0.009
Savings of wattage with replacement ,for one light fitting(kW)	0.034	0.018	0.005
Total savings of wattage(kW)	0.578	0.72	0.135
Annual Energy Saving potential by replacement(kWh)	254	317	59
Annual Financial Saving potential (@Rs. 12.48/unit)- Rs.	3173	3952	741
Investment required, for replacement (@ Rs.400 per LED Tube light & Rs.160 for LED Bulb)	6800	16000	4320
Pay Back Period in years	**2.1**	**4.0**	**5.8**

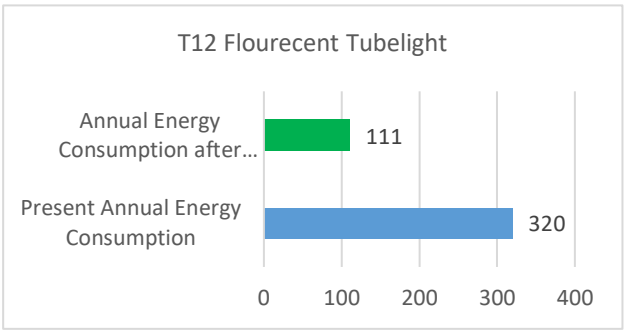
Calculation Table: Fan Load	
Description	**Name of equipment**
	Ceiling Fan
Annual working hours (Average hrs)	880
No. of Fans (nos.)	62
Wattage of one Fan (kW)	0.06
Total load(kW)	3.72
Annual Energy Consumption (kWh)	3274
Wattage of one retrofitting fan (kW)	0.028
Savings of wattage with replacement, for one Fan (kW) – replacing the inefficient Fan with BEE STAR labelled Fan (BLDC).	0.032
Total savings of wattage(kW)	1.984
Annual Energy Saving potential by replacement(kWh)	1746
Annual Financial Saving potential (@Rs. 12.48/unit)- Rs.	21782
Investment required, for replacement (@ Rs.3000 per ceiling Fan)	186000
Pay Back Period in years	**8.5**

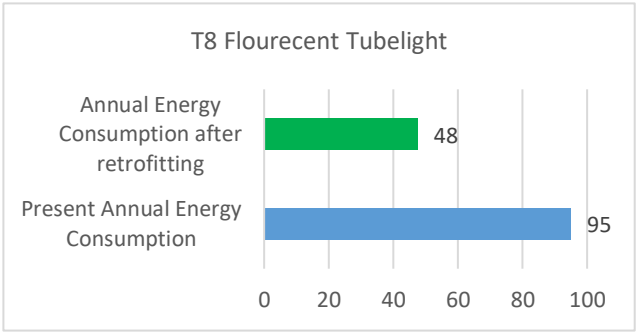
Consumer No: 1145254014593, connected load: 10.8 kW

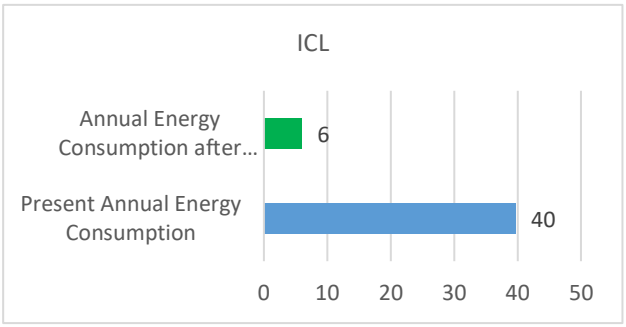
Calculation Table: Light Load			
Description	**Name of equipment**		
	T12	**T8**	**ICL**
Annual working hours (Average)	440	440	660
No. of fittings(nos.)	14	6	1
Wattage of one light fitting(kW)	0.052	0.036	0.06
Total load(kW)	0.728	0.216	0.06
Annual Energy Consumption(kWh)	320.32	95.04	39.6
Wattage of one retrofitting light fitting (kW)	0.018	0.018	0.009
Savings of wattage with replacement, for one light fitting(kW)	0.034	0.018	0.051
Total savings of wattage(kW)	0.476	0.108	0.051
Annual Energy Saving potential by replacement(kWh)	209	47.52	34
Annual Financial Saving potential (@Rs. 6.89/unit)- Rs.	1443	327	232
Investment required, for replacement (@ Rs.400 per LED Tube light & Rs.160 for LED Bulb)	5600	2400	160
Pay Back Period in years	**3.9**	**7.3**	**0.7**

Calculation Table: Fan Load	
Description	**Name of equipment**
	Ceiling Fan
Annual working hours (Average hrs)	1400
No. of Fans (nos.)	18
Wattage of one Fan (kW)	0.06
Total load(kW)	1.08
Annual Energy Consumption (kWh)	1512
Wattage of one retrofitting fan (kW)	0.028
Savings of wattage with replacement, for one Fan (kW) – replacing the inefficient Fan with BEE STAR labelled Fan (BLDC).	0.032
Total savings of wattage(kW)	0.576
Annual Energy Saving potential by replacement(kWh)	806
Annual Financial Saving potential (@Rs. 6.89/unit)- Rs.	5557
Investment required, for replacement(@ Rs.3000 per ceiling Fan)	54000
Pay Back Period in years	**9.7**

Image 6.1: Comparison of Energy Consumption before and after Retrofitting Major Loads. Consumer No: 1145254014593







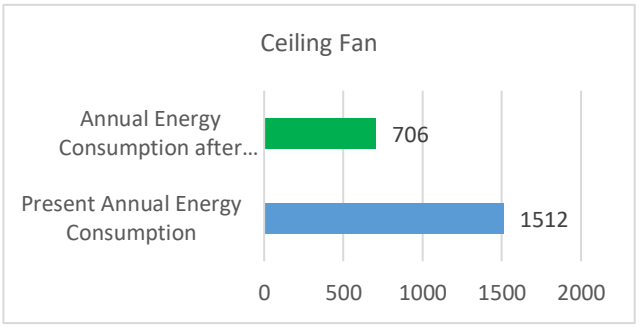
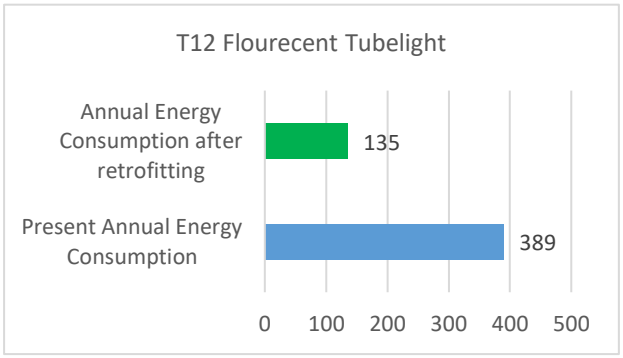
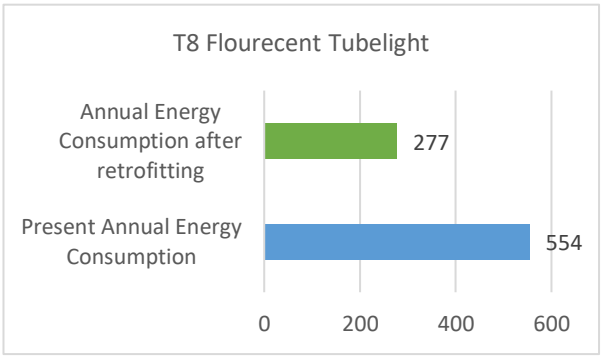
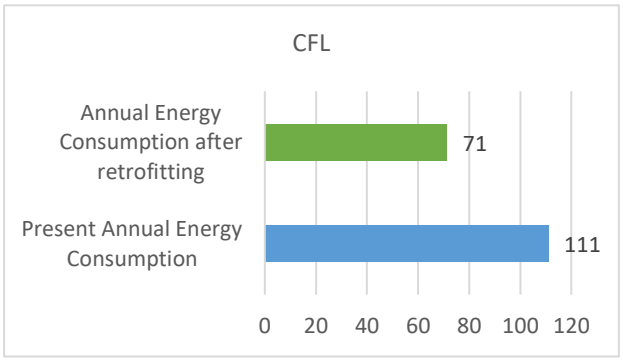
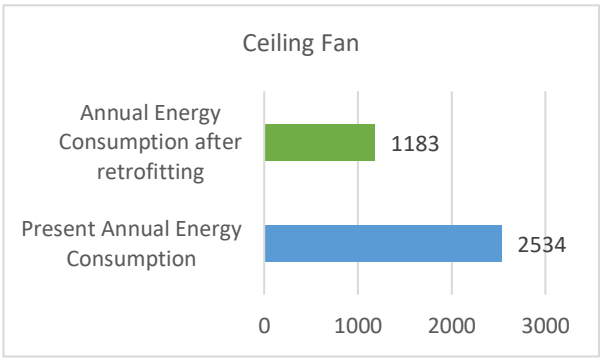


Image 6.2: Comparison of Energy Consumption before and after Retrofitting Major Loads. Consumer No: 1145258017079









Immediate energy savings can be achieved from the effective usage of lights, Fans. The following activities, having no/low investment, can be adopted in these areas.

- Replace the existing Fluorescent Tube lights T12 and T8 with LED lights, (see the Executive Summary).
- Replace the existing CFL with LED bulbs, (see the Executive Summary).
- Replace old/ inefficient fans with BEE star rated (BLDC) ceiling fans (see the Executive Summary).
- Switch OFF appliances, when not in use.
- Utilize BEE 5 star labeled appliances, as far as possible.
- Maintain standard Electrical wiring, to avoid energy loss.
- Avoid very old and obsolete appliances and replace with energy efficient and environment friendly appliances.
- Keep the computers in sleep/shut down mode, when not in use.(i.e, during lunch time)
- Regular cleaning of glass panes of Windows, light fixtures, Fans and other appliances, to get maximum output.
- Utilize the natural lights and wind, as far as possible, to reduce energy consumption.
- An Energy Conservation cell/club can be constituted and arrange Energy Conservation awareness programs. Create awareness among the students & employees, about the importance and practice of Energy Conservation and monitor, regularly, the energy conservation activities.
- Investigate possibilities of using renewable energy solutions and take steps to implement the same.
- Promote use of Electric Vehicles by employees and support e mobility through installation of EV charging stations.

7. Energy Policy

It is recommended that the management shall take necessary steps to formulate and follow energy policy within the organization based on the international standard ISO 50001:2018 - Energy management systems - Requirements with guidance for use. The standard is applicable to any organization regardless of its type, size, complexity, geographical location, organizational culture or the products and services it provides. It provides guidelines pertaining to activities affecting energy performance that are managed and controlled by the organization.

Based on this standard, the organization shall:

- Establish, document, implement and maintain and improve an EnMS (Energy Management System) in accordance with the requirements of this International Standard;
- Define and document the scope and the boundaries of its EnMS
- Determine how it will meet the requirements of this international standard in order to achieve continual improvement of its energy performance and of its EnMS.

Top management shall define the energy policy and ensure that

- It is appropriate to the nature and scale of the organization's energy use and consumption and Includes a commitment to continual improvement in energy performance
- It includes a commitment to ensure the availability of information and of necessary resources to achieve objectives and targets
- It includes a commitment to comply with applicable legal requirements and with other requirements to which the organization subscribes which relate to its energy use, consumption, and efficiency
- It provides the framework for setting and reviewing energy objectives and targets
- It supports the purchase of energy efficient products and services and design for energy performance improvement
- It is documented and communicated at all levels within the organization and regularly reviewed, and updated as necessary

8. Renewable Energy Potential (Solar)

5kWp On-grid rooftop solar is installed in the campus.

9. Annexures

9.1. Annexure I. Load Matrix

This document contains data collected during the walk-through audit and survey conducted on 19-01-2023. The number of appliances and hours of usage are indicated, with respect to each room/area in the building.

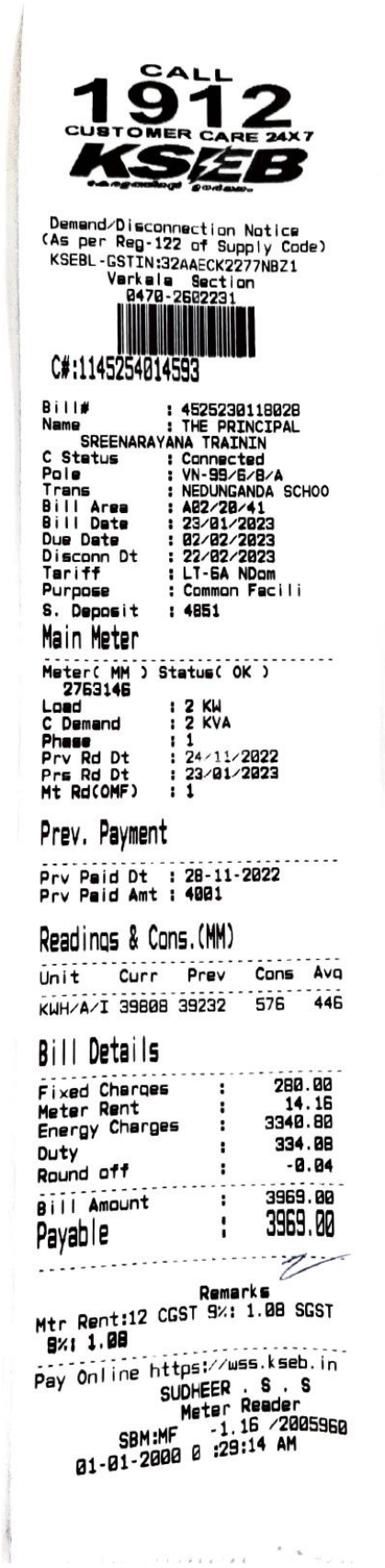
- *Consumer No.: 1145239015079*

SL.NO	APPLIANCE	T12	T8	CFL	LED Tubelight	LED Bulb	LED Flood light 100W	Ceiling Fan	Wall Fan	PC	Pedestal Fan	Air Conditioner 3star
	Name of Building/Room/Location	Nos	Nos	Nos	Nos	Nos	Nos	Nos	Nos	Nos	Nos	Nos
1	**GROUND FLOOR**											
2	Dept of Malayalam		4					4		1		
3	Language Lab				2			1				
4	Outdoor Toilet					3						
5	Corridor					1						
6	Staircase					1						
7	Auditorium			9		9		14			1	
7	**FIRST FLOOR**											
8	Natural Science			2				2	1	1		
9	Central Library	2	20					9		4		
10	Computer Lab			16				3				
11	Dpt of Social Science	2						2				
12	Corridor				5							
13	Dpt of Physical Science	2						2				
14	Toilet					5						
15	Staircase					1						
	SECOND FLOOR											
1	Education Technology Lab	3	2					8		26		2
2	Seminar Hall	3	3					6				
3	Seminar Hall 2	2	4					6				
4	Store	1										
5	Dpt of Mathematics		2					2				
6	Corridor				4							
7	Dptof English	2						2				
	THIRD FLOOR							1				
1	Outdoor					1	1					
	Total	**17**	**35**	**18**	**11**	**12**	**1**	**48**	**1**	**32**	**1**	**2**

- *Consumer No.: 1145254014593*

SL.NO	APPLIANCE	ICL	T12	T8	CFL	LED Tube light	LED Bulb	Round LED Light	Ceiling Fan	Wall Fan	Pedestal Fan	PC	Printer	Xerox
	Name of Building/Room/Location	Nos	Nos	Nos	Nos	Nos	Nos	Nos	Nos	Nos	Nos	Nos	Nos	Nos
	Office Building													
1	Office Room			1		4			3		1	2	1	1
2	Boys Common Room			1		1			1					
3	Sick Room													
4	Toilet			1			1							
5	Staff Room					5			6	2				
6	Toilet	1												
7	Remedial Program					1			1					
8	Multipurpose Room			1		5			4			1	1	
9	Toilet						1							
10	Principal Room							7	2			3	1	1
11	Toilet						1							
12	Corridor					4								
13	Generator Room			1					1		1			
14	SUPW Unit			1			1							
15	Outdoor					2								
16	Toilet						1							
17	**GOLDEN JUBILEE BLOCK(UGC)**													
18	Med Class No.1		2						4					
19	Med Class No.2		2				2		4					
20	M.ed Tutorial		2				3		4			1		
21	Physical Science Lab		2									1		
22	Corridor		1											
23	Staircase		1											
24	**FIRST FLOOR**													
25	Physical education Dept		3						2					
26	Outdoor													
27														
28	**MUSIC ROOM**						2		1					
29														
30	**LADIES WAITING ROOM**		1				1		1					
31	Toilet 1						4							
32	Toilet 2				4									
33	Toilet 3						4							
	Total	**1**	**14**	**6**	**4**	**22**	**21**	**7**	**34**	**2**	**2**	**8**	**3**	**2**

9.2. Annexure II. Electricity Bills



CALL
1912
CUSTOMER CARE 24X7
KSEB

Demand/Disconnection Notice
(As per Reg-122 of Supply Code)
KSEBL-GSTIN:32AAECK2277NBZ1
Varkala Section
0470-2602231

C#:1145254014593

Bill# : 4525230118028
Name : THE PRINCIPAL
SREENARAYANA TRAININ
C Status : Connected
Pole : VN-99/6/8/A
Trans : NEDUNGANDA SCHOO
Bill Area : A02/20/41
Bill Date : 23/01/2023
Due Date : 02/02/2023
Disconn Dt : 22/02/2023
Tariff : LT-6A NDom
Purpose : Common Facili
S. Deposit : 4851

Main Meter

Meter(MM) Status(OK)
2763146
Load : 2 KW
C Demand : 2 KVA
Phase : 1
Prv Rd Dt : 24/11/2022
Prs Rd Dt : 23/01/2023
Mt Rd(OMF) : 1

Prev. Payment

Prv Paid Dt : 28-11-2022
Prv Paid Amt : 4001

Readings & Cons.(MM)

Unit	Curr	Prev	Cons	Avg
KWH/A/I	39808	39232	576	446

Bill Details

Fixed Charges	:	280.00
Meter Rent	:	14.16
Energy Charges	:	3340.80
Duty	:	334.08
Round off	:	-0.04
Bill Amount	:	3969.00
Payable	:	3969.00

Remarks
Mtr Rent:12 CGST 9%: 1.08 SGST 9%: 1.08

Pay Online https://wss.kseb.in
SUDHEER . S . S
Meter Reader
SBM:MF -1.16 /2005960
01-01-2000 0 :29:14 AM

KERALA STATE ELECTRICITY BOARD LIMITED

DEMAND CUM DISCONNECTION NOTICE

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

Section	**[4525]-Electrical Section Varkala**	**Phone#**	0470-2602231	**Customer Care**	1912
Consumer#	**1145258017079**	Reg. Mob# **807xxxx407**	**Regular CC Bill**	**KSEBL GSTIN: 32AAECK2277NBZ1**	

Name & Mailing Address

THE PRINCIPAL

SREENARAYANA TRAINING COLLEGE, AP.IX/442, NED

UNGANDA

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 Emakulam-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#	**4525230101528**	**Bill Area**	M03/1	**DTR**	NEDUNGANDA SCHOOL
Billing Period	**1/2023**[Monthly]	**Tariff/Phase**	LT-6A/Three	**Pole#**	VN-99/6/8A
Bill Date	**02-01-2023**	**Due Date**	**12-01-2023**	**DC Date**	**27-01-2023**
Contract Demand	**(Nil)** VA [75% : 0KV, 130% : 0KV]	**Connected Load**	14320 Watts	**Security Deposit**	Rs.14500.00

Meter#	L&T001080162891090	**Average consumption(Monthly)**	
Meter Digits	8.0	**Power Unit/Zone**	**CUMULATIVE**
Meter Type/Owner	NET Meter/KSEB	KWH	500

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**	**02-01-2023**	**Working**

Power Unit	**Zone**	**Trading**	**Initial Reading(IR)**	**Final Reading(FR)**	**OMF**	**Units***
KWH	Cumulative	Import	11445.00	11721.00	1	276
KWH	Cumulative	Export	13488.00	13659.00	1	171

Remarks :

Last Paid Amount - Rs.1320.00

Last Payment Date - 19-01-2023

Changes effected between **01-12-2022** and **01-12-2022**

Description	Date	Zone	Tr.	IR	FR	MF	Units
Check Reading	01-12-2022	WAL	I	11445.00	11445.00	1	0
Check Reading	01-12-2022	WAL	E	13488.00	13488.00	1	0
Regular Reading Point	02-01-2023	WAL	I	11445.00	11721.00	1	276
Regular Reading Point	02-01-2023	WAL	E	13488.00	13659.00	1	171
Units[Import-Export]							**105**

Solar Generation

Description	Date	Zone	Tr.	IR	FR	MF	Units
Regular Reading Point	02-01-2023	WAL	I	1596.00	1851.00	1	255

Bill Details			**[INR] Amount(Rs.)**
a)	Fixed Charges	Fixed Charge[FC]	1050.00
		Sub Total	**1050.00**
b)	Energy Charges	Energy Charge[EC]	179.80
		Sub Total	**179.80**
c)	Other Charges	Electricity Duty[ED]	17.98
		Meter Rent[MR]	50.00
		ED[Self Generation]	3.06
		Sub Total	**71.04**
d)	GST	MR-CGST	4.50
		MR-SGST	4.50
		Sub Total	**9.00**
e)	Round Off		0.16
f)	**Total Amt.(Bill#4525230101528)** *(a+b+c+d+e)*		**1310.00**
g)	Surcharge		1.00
h)	Reconnection Fee		0.00
i)	Interim Bills		0.00
j)	Arrears		0.00
k)	Less paid/adj.		-1311.00
l)	Less Advance		-9.00
	Net Payable*(f+g+h+i+j-k-l)*		**0.00**

Demand for 1/2023 is Rupees One Thousand Three 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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KERALA STATE ELECTRICITY BOARD LIMITED

DEMAND CUM DISCONNECTION NOTICE

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

Section	**[4525]-Electrical Section Varkala**	**Phone#**	0470-2602231	**Customer Care**	1912
Consumer#	**1145255023011**	Reg. Mob# **949xxx643**		**Regular CC Bill**	**KSEBL GSTIN: 32AAECK2277NBZ1**

Name & Mailing Address

THE PRINCIPAL

SREE NARAYANA TRAINING COLLAGE, NEDUNGANDA

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#	**4525221118454**	**Bill Area**	A05/21	**DTR**	NEDUNGANDA SCHOOL
Billing Period	**11/2022**[Bi-Monthly]	**Tariff/Phase**	LT-6F/Three	**Pole#**	OM-4/8/8/6
Bill Date	**24-11-2022**	**Due Date**	**04-12-2022**	**DC Date**	**19-12-2022**
Contract Demand	**(Nil)** VA [75% : 0KV, 130% : 0KV]	**Connected Load**	7685 Watts	**Security Deposit**	Rs.8000.00
Meter#	GIL004500004441922	**Average consumption(Monthly)**			
Meter Digits	8.0	**Power Unit/Zone**	**CUMULATIVE**		
Meter Type/Owner	TOD/KSEB	KWH	8		

Last Billed Rdg. Date	Prev. Rdg. Date	Prev. Meter Rdg. Status	Prst. Rdg. Date	Prst. Meter Rdg. Status
23-09-2022	**25-10-2022**	**Door Lock**	**24-11-2022**	**Working**

Power Unit	Zone	Trading	Initial Reading(IR)	Final Reading(FR)	OMF	Units*
KWH	Cumulative	Import	80.00	80.00	1	0

Remarks :

Last Paid Amount - Rs.2801.00

Last Payment Date - 22-12-2022

Changes effected between **23-09-2022** and **25-10-2022**

Description	Date	Zone	Tr.	IR	FR	MF	Units
Disconnection	22-10-2022	WAL	I	80.00	80.00	1	0
Reconnection	25-10-2022	WAL	I	80.00	80.00	1	0
Regular Reading Point	24-11-2022	WAL	I	80.00	80.00	1	0

	Bill Details		**[INR] Amount(Rs.)**
a)	Fixed Charges	Fixed Charge[FC]	2720.00
		Sub Total	**2720.00**
		Sub Total	**0.00**
c)	Other Charges	Meter Rent[MR]	30.00
		Sub Total	**30.00**
d)	GST	MR-CGST	2.70
		MR-SGST	2.70
		Sub Total	**5.40**
e)	Round Off		-0.40
e)	**Total Amt.(Bill#4525221118454)** *(a+c+d+e)*		**2755.00**
f)	Surcharge		20.00
g)	Reconnection Fee		30.00
h)	Interim Bills		0.00
i)	Arrears		0.00
j)	Less paid/adj.		-2805.00
k)	Less Advance		-0.00
	Net Payable*(e+f+g+h+i-j-k)*		**0.00**

Demand for 11/2022 is Rupees Two Thousand Seven Hundred and Fifty 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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9.3. Annexure III- Standard Data

Standard watts of fitting		
Sl. No.	**Item**	**Watts**
1	T12 Fluorescent tube light	52
2	T8 Fluorescent tube light	36
3	Old Ceiling Fan	60
4	LED Tube Light	18

9.4. Annexure IV- Vendor Details

Item	Brands
LED Tube Light	Philips, Havells, Wipro, Syska
BEE Certified star rated/BLDC ceiling fan	Crompton Greaves, Havells, Luminous, Atomberg
Led Bulb	Havells, Syska, Philips, Wipro

ENERGY MANAGEMENT CENTRE - KERALA

Save Energy Save our Planet

Energy Management Centre - Kerala
Department of Power, Government of Kerala
Sreekariyam P.O., Thiruvananthapuram 695017
Email : emck@keralaenergy.gov.in, Web : www.keralaenergy.gov.in