Energy Audit Report

(2021-22)

Shiv Chhatrapati Shikshan Sanstha's

Rajarshi Shahu Mahavidyalaya (Autonomous)

Near Central Bus Stand, Latur – 413512 (MS)

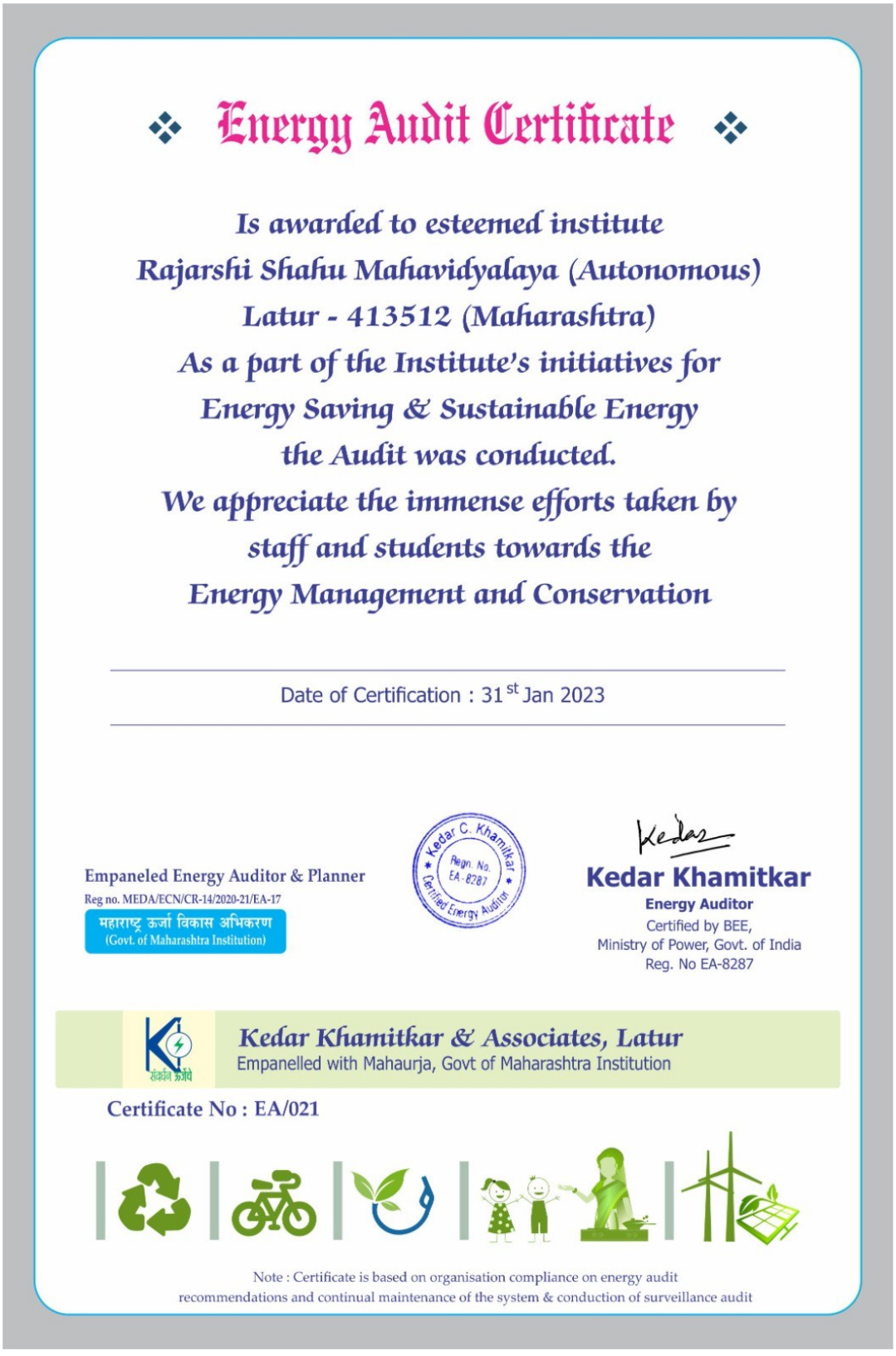
Energy Audit Conducted by

KEDAR KHAMITKAR & ASSOCIATES

Energy Auditor & Planner

(Empanelled Mahaurja, Govt. of Maharashtra)

M: 9850244701 Email. : urjabachat@gmail.com



Energy Audit Certificate

Is awarded to esteemed institute
Rajarshi Shahu Mahavidyalaya (Autonomous)
Latur - 413512 (Maharashtra)
As a part of the Institute's initiatives for
Energy Saving & Sustainable Energy
the Audit was conducted.
We appreciate the immense efforts taken by
staff and students towards the
Energy Management and Conservation

Date of Certification : 31st Jan 2023

Empaneled Energy Auditor & Planner
Reg no. MEDA/ECN/CR-14/2020-21/EA-17
महाराष्ट्र ऊर्जा विकास अभिकरण
(Govt. of Maharashtra Institution)

Kedar C. Khamitkar Regn. No. EA-8287 Certified Energy Auditor

Kedar Khamitkar
Energy Auditor
Certified by BEE,
Ministry of Power, Govt. of India
Reg. No EA-8287

Kedar Khamitkar & Associates, Latur
Empanelled with Mahaurja, Govt of Maharashtra Institution

Certificate No : EA/021

Note : Certificate is based on organisation compliance on energy audit recommendations and continual maintenance of the system & conduction of surveillance audit

The regulation stipulates that the interval of time for conduct and compliance of subsequent energy audit shall be three years with effect from the date of the submission of the previous energy audit report by the energy auditor to the management of the designated consumer.

Status Energy Efficiency & Management

Requirements for the NAAC

KK & Associates Govt Certified Energy Auditor team has been Conducted Detailed Energy Audit of **M/s Rajarshi Shahu Mahavidyalaya** Building Located at Latur- District Maharashtra

During Energy Audit We have found Environmental Consciousness and Sustainability initiatives in their Campus.

1. Percentage of Annual Lighting power requirement met through LED Bulbs (Current Year Data) = **85** %

2. Percentage of Annual Power requirements met through Renewable Energy Sources Current year data is **20**%

KEDAR KHAMITKAR
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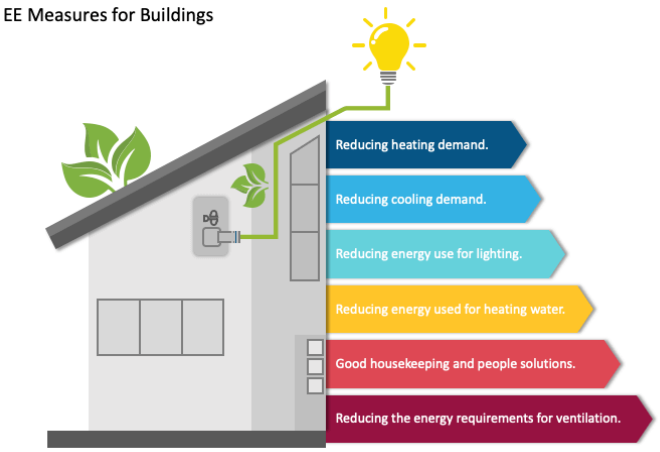

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Executive Summary

The objective of the audit was to study the energy consumption pattern of the facility, identify the areas where potential for energy/cost saving exists and prepare proposals for energy/cost saving along with investment and payback periods. The salient observations and recommendations are given below.

Sr	Recommendations	Savings / year	Investment	Payback
1	**Install APFC 20 kVAr** Automatic Power Factor Controller @10% Savings	15000 KWH	45000/-	3 yrs.
2	**Replacement of Existing Inefficient Ceiling Fans** (70w) Qty. 650 No's with Efficient BLDC fans (28W) (@6hrs & 275days)	45000 KWH	1400000/-	4.28 Yrs.
3	**Improve Power Quality :** Install Voltage Servo Stabilizer of 75 KVA Capacity	10000 KWH	155000/-	2.12 yrs.
4	**Install occupancy Sensors** in Campus Energy Consumption Monitoring & Security purpose (Class room @23 KW Load / 100 Sensors)	7000 KWH	150000/-	2.30 Yrs.
5	**Sign Board Switch off button when not necessary - Conduct Awareness Training Program**	5000 KWH	No Investment	Immediate

Preface

An energy audit is a study of a plant or facility to determine how and where energy is used and to identify methods for energy savings. There is now a universal recognition of the fact that new technologies and much greater use of some that already exist provide the most hopeful prospects for the future.

Data collection for energy audit of the Rajarshi Shahu Mahavidyalaya was conceded by EA Team for the period of 17th to 19th Oct 2022. This audit was over sighted to inquire about convenience to progress the energy competence of the campus.

All data collected from each classroom, Workshop, every room. The work is completed by considering how many Tubes, Fan, A.Cs, Electronic instruments, etc. in each room. How much was participation of each component in total electricity consumption.

Acknowledgement

We express our sincere gratitude to the authorities of Rajarshi Shahu Mahavidyalaya (Autonomous), Latur for entrusting and offering the opportunity of energy performance assessment assignment.

Honorable Dr. Mahadev Haridas Gavhane Sir

We are thankful to Institute for their positive support in undertaking the task of system mapping and energy efficiency assessment of all electrical system, utilities and other workshop equipment. The field studies would not have been completed on time without their interaction and guidance. We are grateful to their cooperation during field studies and providing necessary data for the study.

With Best Wishes,

Kedar Khamitkar

- Energy Auditor, Certified by Bureau of Energy Efficiency, Ministry of Power, Govt. of India
- Empanelled Consultant MAHAURJA , Govt. of Maharashtra

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Energy Performance Index (EPI)

Rajarshi Shahu College, Latur Uses Electrical Energy from MSEDCL Maharashtra State Electricity Distribution Company Limited

1.The average cost of energy is around Rs. **82000**/- Month.

2. The Specific Energy Consumption (SEC) is the ratio of energy required per square meter.

Total Electricity Consumption **144553** KWH /Year

Total Built-up Area **4963** Sq. Meter

In this case the SEC is evaluated as electrical units consumed per square meter of area.

EPI calculated as under (for Electricity): 29.12 KWH/Sq. Meter

EPI KWH/Sq. Meter/Year	Star Label
80-70	1 Star
70-60	2 Star
60-50	3 Star
50-40	4 Star
Below 40	5 Star

Observations:

As per BEE Star Rating Guidelines Existing Rajarshi Shahu Mahavidyalaya Building may be considered as 5 Star.

Chapter: 1 Introduction:

Rajarshi Shahu Mahavidyalaya (Autonomous), Latur, the higher educational institute of Shiv Chhatrapati Shikshan Sanstha, was established in 1970. In the beginning, we had to fight for survival due to the problems of accommodation, finance and non-recognition by the elite class of the society of this region. The adverse situation was in a real sense proved to be a boon and an opportunity to us. We aim at providing quality education to the underprivileged students of the region. It started functioning since June 1970 with just 51 students in the undergraduate programs of Arts and Commerce and introduced UG Science in 1971, then affiliated to Marathwada University, Aurangabad. The institute had gone through a chain of adverse situations and a tuff journey for a decade like an Ancient Mariner. In 1978, a history was created as three out of three University merits in UG Commerce were from our institute which brought name, fame and recognition to the institute. Since then, the tradition of merit has been maintained with the motto-Pursuit of Excellence.

1	Class Rooms (No. of class rooms and covered area in sq. Ft.)	No. of classrooms: 59 (Covered area in Sq. Ft.: 45306)
2	Laboratories (No. of labs rooms and covered area in sq. Ft.)	No. of laboratories: 49 (Covered area in sq. Ft.: 56632.5)
3	Central Library (Total Area)	Separate Reading Rooms for Boys, Girls and Faculty and Research Scholars (13350 Sq. Ft.)
4	Hostels (No. of rooms with students accommodated)	with double occupancy (No. of rooms :85)
5	Administrative Block	1
6	Principal Office	1
7	Staff Room	2
8	Common Room	2
9	Canteen	2
10	Auditorium	1
11	Internet facilities	Separate E-learning Lab for students with free internet and campus with Wi-Fi facility
12	Medical facilities	Health Care Center
13	Transport facilities	To the Sports complex
14	Sports facilities (indoor/outdoor), Play grounds, Fitness equipment, sports coaches	Gymnasium (for boys and girls), Swimming Pool, Indoor games facilities
15	Total Built-up Area	Covered area in sq. Meter. (4963)

16	Others	• Lift
		1 History Museum
		2 Seminar Hall
		3 Central Instrumentation Center
		4 Language Laboratory
		5 GIS Laboratory
		6 Yoga Center
		7 Media Lab
		8 Green Shade Net
		9 Botanical Garden
		10 NSS Office
		11 Yashwantrao Chavan Maharashtra Open University Centre
		12 I-card processing unit
		13 Rector's office
		14 Guest House
		15 Solar Water Heater
		16 Solar Photovoltaic Panel
		17 Commerce Lab
		18 Competitive Exam Unit
		19 Open Air Stage
		20 Examination Section,
		21 Reading rooms
		22 Ladies common room
		23 NCC (boys and girls) Office
		24 Co-operative society
		25 Reprographic Unit
		26 Parking
		27 Canteen/ Tiffin Room
		28 -Learning Centre
		29 Water Filter with RO system
		30 Generators
		31 GC/NAAC Cell
		32 Central Instrumentation Center
		33 Common Fabrication Facility
		34 Divyangjan Facilities
		35 Placement Cell

Chapter 2: Energy Audit Objectives:

Rajarshi Shahu Mahavidyalaya entrusted the work of conducting a detailed Energy Audit of campus with the main objectives given bellow:

- To study the present pattern of energy consumption
- To identify potential areas for energy optimization
- To recommend energy conservation proposals with cost benefit analysis.

Scope of Work, Methodology and Approach:

Scope of work and methodology were as per the proposal .While undertaking data Collection, field trials and their analysis, due care was always taken to avoid abnormal situations so as to generate normal/representative pattern of energy consumption at the facility.

Approach to Energy Audit:

We focused our attention on energy management and optimization of energy efficiency of the systems, sub systems and equipment's. The key to such performance evaluation lies in the Sound knowledge of performance of equipment's and system as a whole.

Energy Audit:

The objective of Energy Audit is to balance the total energy inputs with its use and to identify the energy conservation opportunities in the stream. Energy Audit also gives focused Attention to energy cost and cost involved in achieving higher performance with technical and financial analysis. The best alternative is selected on financial analysis basis.

Chapter: 3 Energy Audit Methodology

Energy Audit Study is divided into following steps

1. Historical data analysis:

The historical data analysis involves establishment of energy consumption pattern to the established base line data on energy consumption and its variation with change in production volumes.

2. Actual measurement and data analysis:

This step involves actual site measurement and field trials using various portable Measurement instruments. It also involves input to output analysis to establish actual operating Equipment efficiency and finding out losses in the system.

3. Identification and evaluation of Energy Conservation Opportunities:

This step involves evaluation of energy conservation opportunities identified during the energy audit. It gives potential of energy saving and investment required to implement the Proposed modifications with payback period.

4. Energy Audit Instruments used

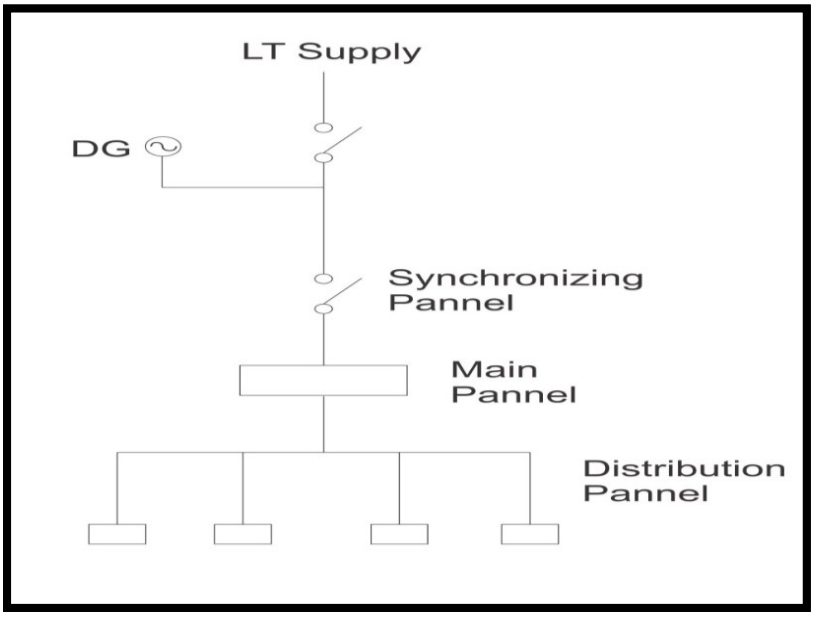
a) Power Quality Analyser HIOKI - 3197
b) Lux Meter
c) Thermal Imager Fluke – PTI 120
d) Earth Tester MECO

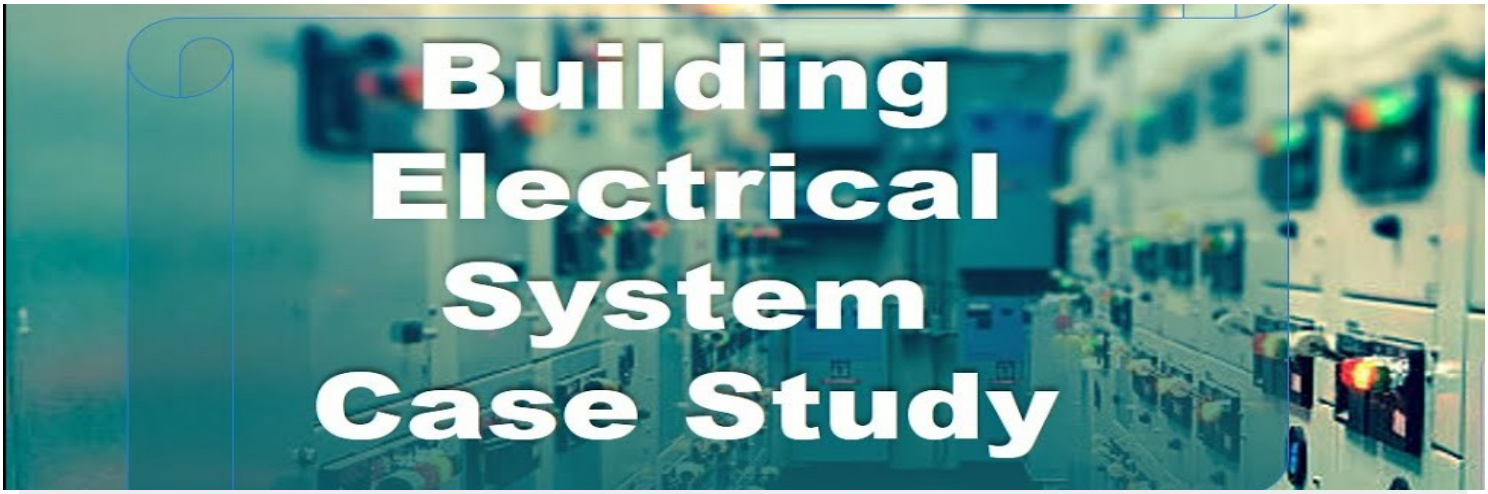
Principal Dr. Gavhane Sir were present During Power Quality Analysis work.

Chapter: 4. Study of Electrical Systems

Electrical Energy Sources:

1. The electrical supply to the RSML comes from MSEDCL LT supply.
2. Diesel Generator 75 KVA (Three Units of 25 KVA each capacity installed)
3. Solar Power Plant 28 KW





Observations:

1. **Single line electrical network diagram is not available**.
2. Units generated from Diesel Generator record not available.

Suggestions: Keep logbook – Keep monthly Diesel Consumption records.

MSEDCL LT supply: Mahavitaran has been installed two meters in RSML Campus.

The details of meter are as under

Meter - A Consumer No. 610550227382

Meter - B Consumer No. 610550069965

The electrical bills from MSEDCL for 12 months from Jan 2022 to Dec 2022 have been studied.

RSML Meter 'A' Details:

		Consumer No.	610550227382
SN	**Details of Electricity Demand**	**Tariff**	**89 LT-VII B I**
1	Sanctioned Load	**28**	KW
2	Contract Demand	**30**	kVA
3	Recorded Maximum Demand	**46**	kVA

RSML Meter 'B' Details:

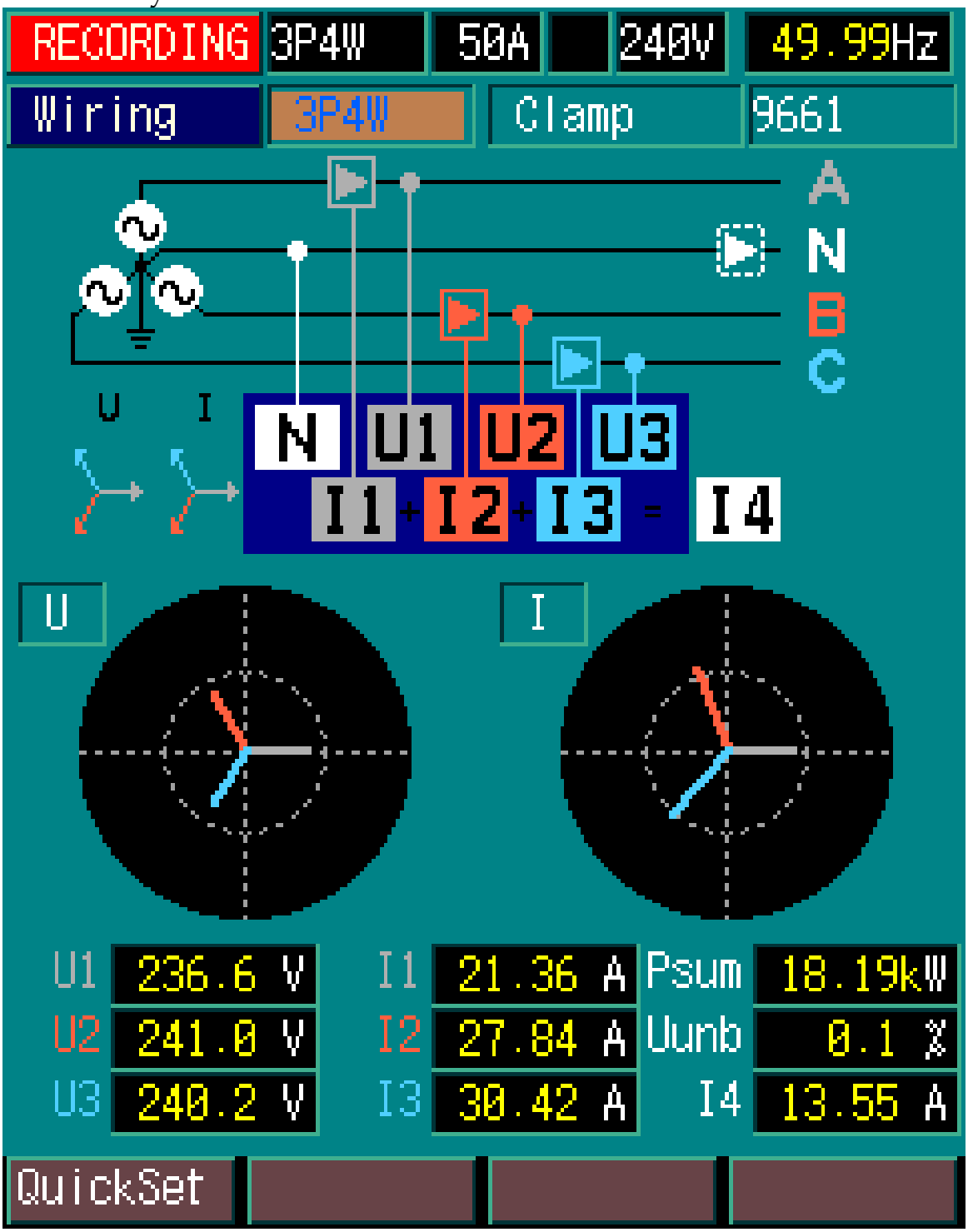
		Consumer No.	610550069965
SN	**Details of Electricity Demand**	**Tariff**	**073 /LT VII(B) Public Service 0-20KW Oth**
1	Sanctioned Load	**20**	KW

Month	Meter 'A' Consumer No. 610550069965	Meter 'B' Consumer No. 610550227382	KWH
Jan-22	5043	2,818	7861
Feb-22	4633	4,484	9117
Mar-22	5965	7,556	13521
Apr-22	9255	9,047	18302
May-22	7122	4,100	11222
Jun-22	4981	2,874	7855
Jul-22	5154	6,968	12122
Aug-22	5751	8,417	14168
Sep-22	7477	9,073	16550
Oct-22	6460	6,522	12982
Nov-22	5080	4,238	9318
Dec-22	5342	6,193	11535
		Total KWH / Year	**144553**

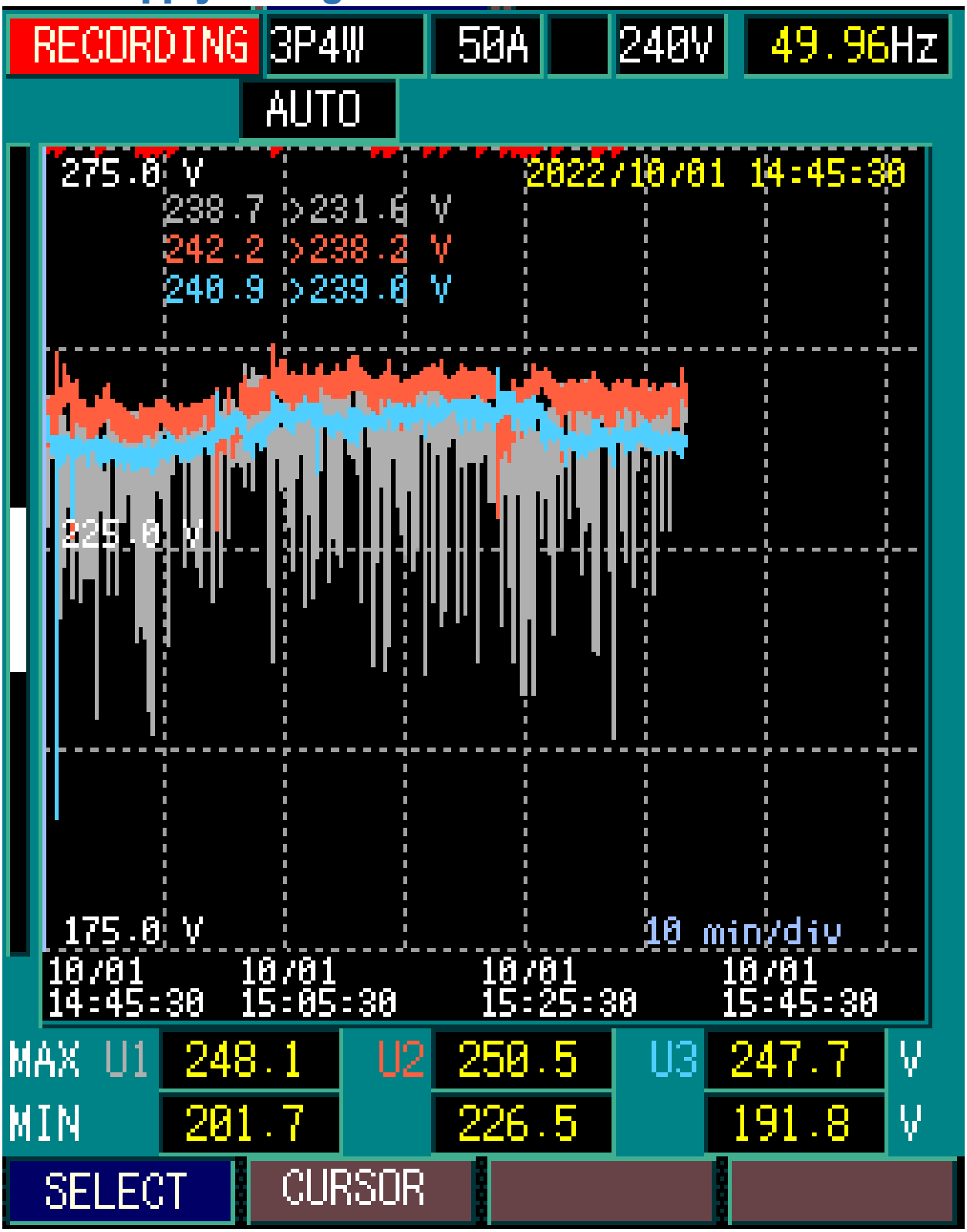
Chapter: 5 Power Quality Monitoring Results

4.1 Power Quality Analysis

Power quality issues can affect the operation of critical loads and can have the negative impact on operation. This power quality analyser can monitor the cost of energy wasted due to poor power quality. The wider range of measurement function and measurement method in this analyser is the ideal tool and for the calculation of errors.

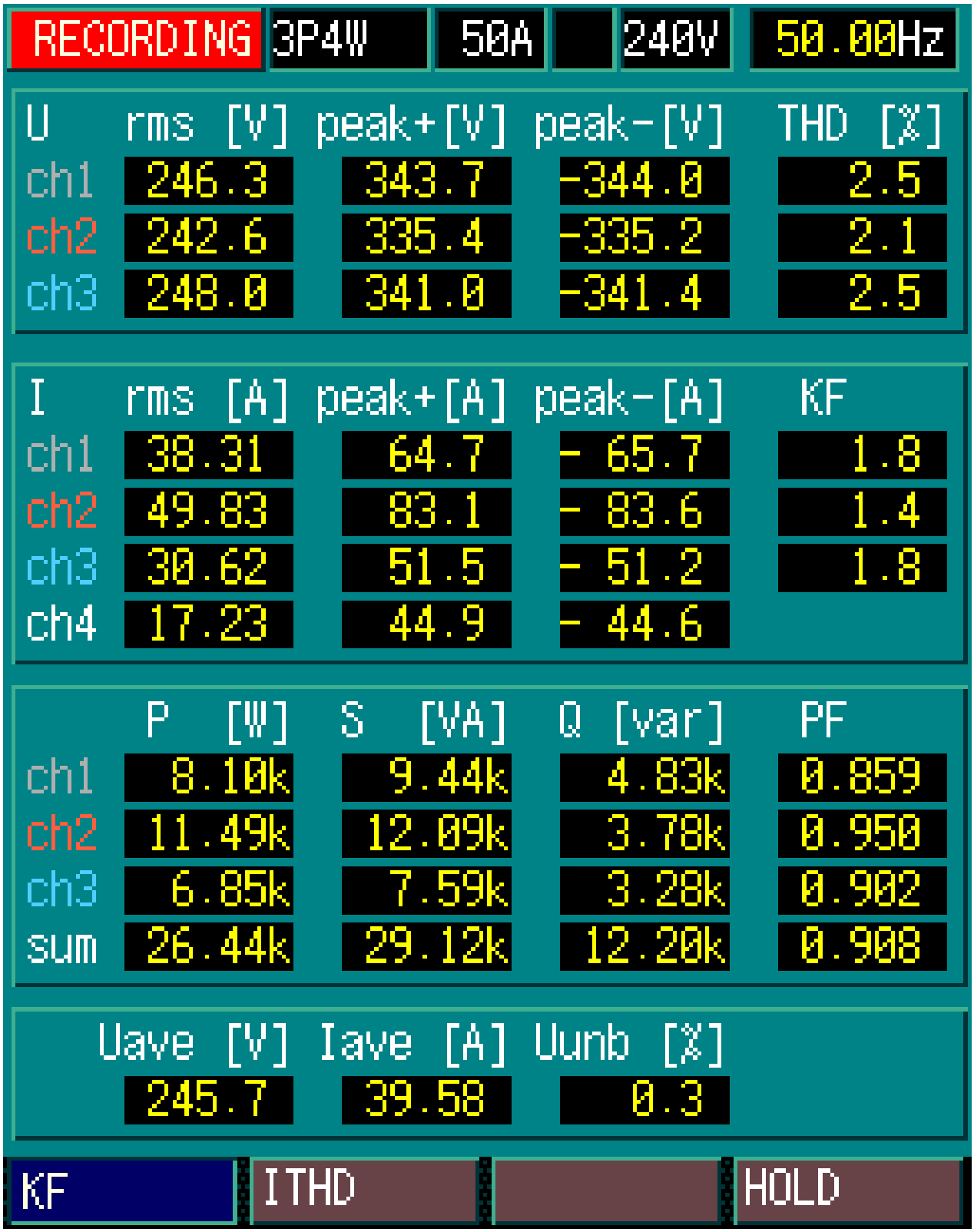


4.2 Supply Voltage level Overview



Observations: Poor Power Quality Incoming Power to RSML Institute
Suggestions: Install Voltage Stabilizer of 100 KW

4.3 Power Factor:



Observations: Power Factor 0.90 found poor.

Suggestions: Improve Power Factor. Install APFC 20KVAr

Chapter: 6 Historical Electricity Billing Analysis

General Observations based on Electricity Bill:

Study of Electrical Demand:

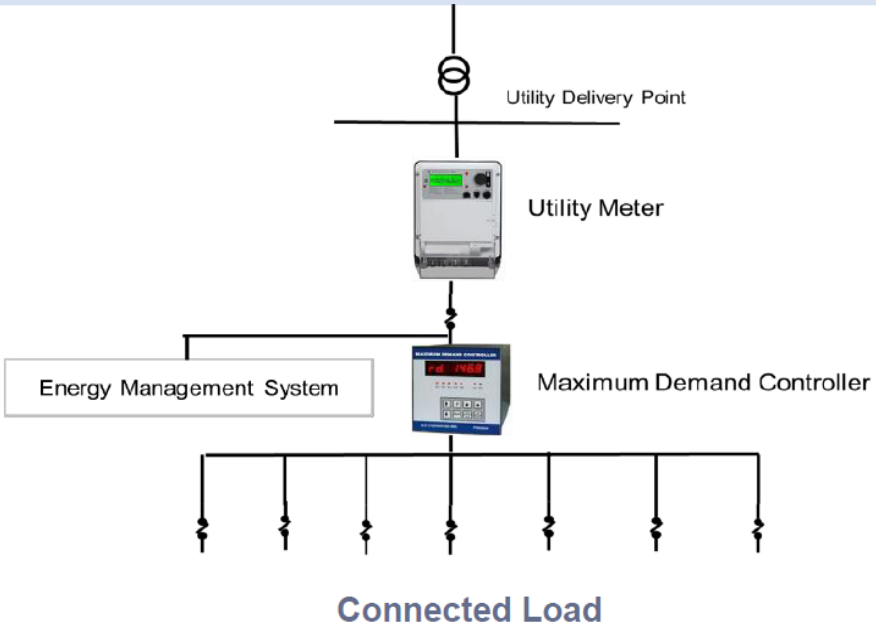
Observations: It is observe that- Contract Demand is **30 kVA**

While the recorded Maximum Demand is **46 kVA**.

Annual Charges Paid for Excess Demand: Rs. 38460/-

Recommendations:

Install Demand Controller

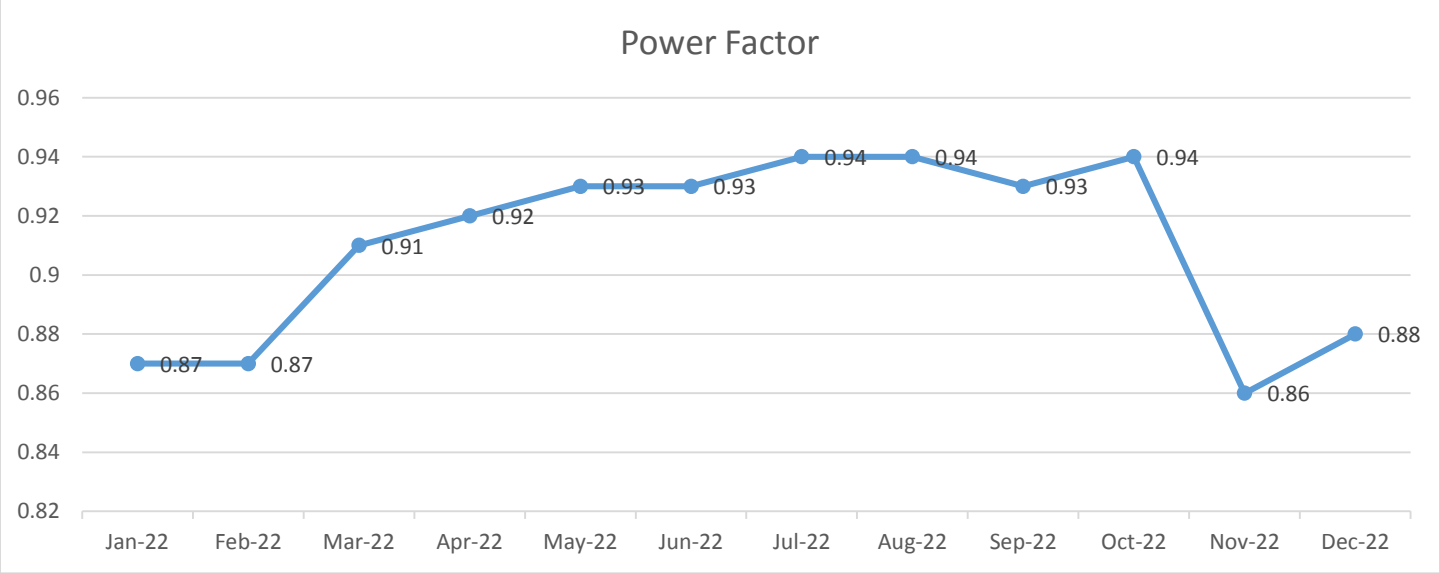


Demand Controller for Energy Management

Every electrical system needs power as the supply. Power is rated at each and amount of energy is used to accomplish the work. Electrical power is measured in kwhr which is determine by V*I. In the Buildings high power consumption than the contracted one can lead to severe penalties. Often there are power peak produce by the load co incidence that normally do not work in simultaneously. In order to avoid penalties one solution would be increase in the contracted power according to the maximum resister peak but on contract this will force to pay higher power than it is really needed. Another solution will be avoiding the consumption peaks through a vigilance element that a device of the risk situation or it can disconnect certain noncritical load such as air conditioning compressors lighting and fans. Maximum demand refers to the maximum amount of electrical energy that is being consumed at a given time. The general purpose of maximum demand meter is to monitor and control the maximum power demand in order also can reduced the monthly electricity bill. By using the meter, the user do not have to worry that their electricity bill will increase thus have to pay lot of money on bills. Maximum power demand meter can benefit every user specially Buildings.

Chapter: 7 Study of Power Factor:

Energy Meter – A



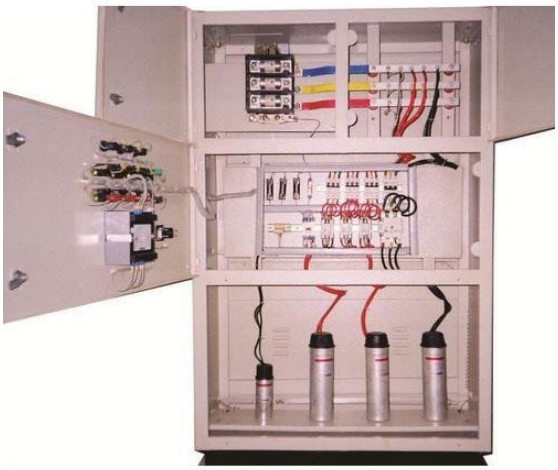
Observations: Power Factor found poor.

Power factor is affected during Jan 2022 & Feb 22 is 0.87. Similarly found Very Poor in Nov 22 is 0.86 and Dec 22 is 0.88

Power Factor (P.F.): A good Power Factor provides a better voltage. Reducing the pressure on electrical distribution network. Reducing cable heating, cable over loading and cable losses. Reducing over loadings of control gears and switch-gears etc. Improve Power Factor up to 0.99 or UNITY.

Suggestions: To maintain PF unity install APFC.

Hence we have to more focus on power factor correction/improvement using capacitor bank i.e. APFC panel. (@20 kVAr)



Chapter: 8 Study of Month wise Load Factor

Electrical Load factor is a measure of the utilization rate, or efficiency of electrical energy usage. It is the ratio of total energy (KWh) used in the billing period divided by the Possible total energy used within the period, if used at the peak demand (KW) during the entire period. Thus,

If your load factor ratio is above 0.75 electrical usage is reasonably efficient.

If the load factor is below 0.5, you have periods of very high usage (demand) and a low utilization rate. Low load factor customers would benefit from a peak demand control system or from a Battery Energy Storage System to distribute electrical usage out over longer intervals of time and smooth peaks.

Low load factors, such as below 0.4, contribute significantly to the overall monthly electric bill in the form of demand charges. These demand charges are listed on the bill as coincident demand, facilities demand, and summer time related demand.

Month wise Load Factor Variation Meter 'A'

Bill Month	Load Factor
Dec-22	0.39
Nov-22	0.3
Oct-22	0.32
Sep-22	0.42
Aug-22	0.41
Jul-22	0.38
Jun-22	0.19
May-22	0.24
Apr-22	0.44
Mar-22	0.43
Feb-22	0.31
Jan-22	0.21

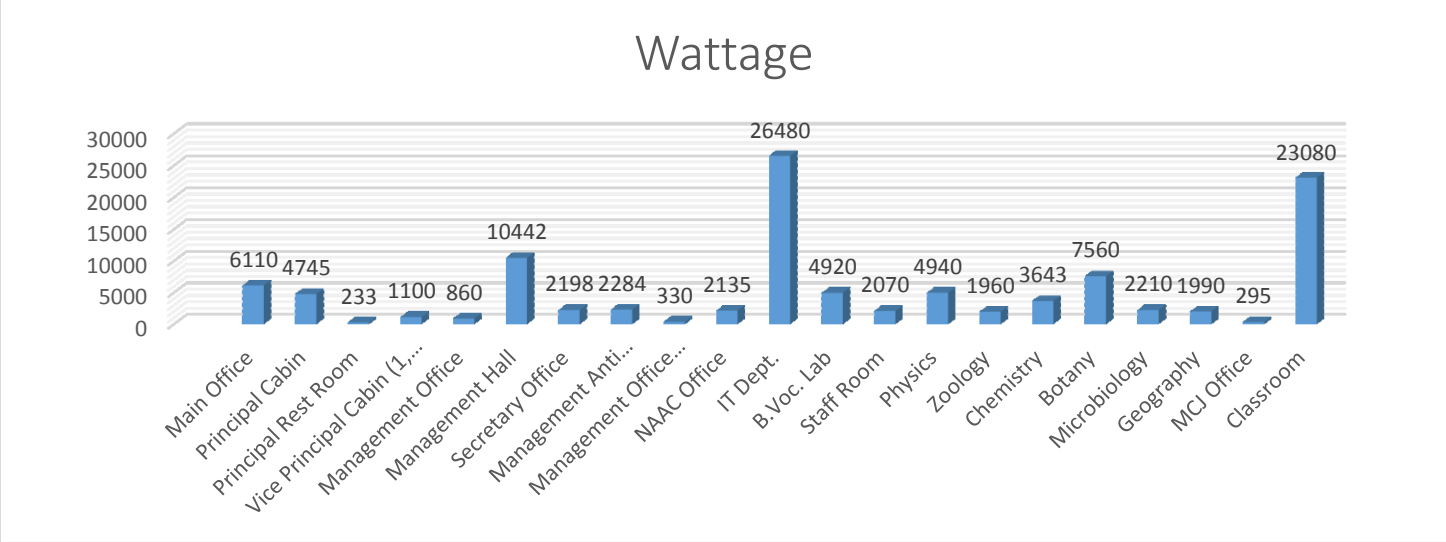
Observations: load factor is below 0.5

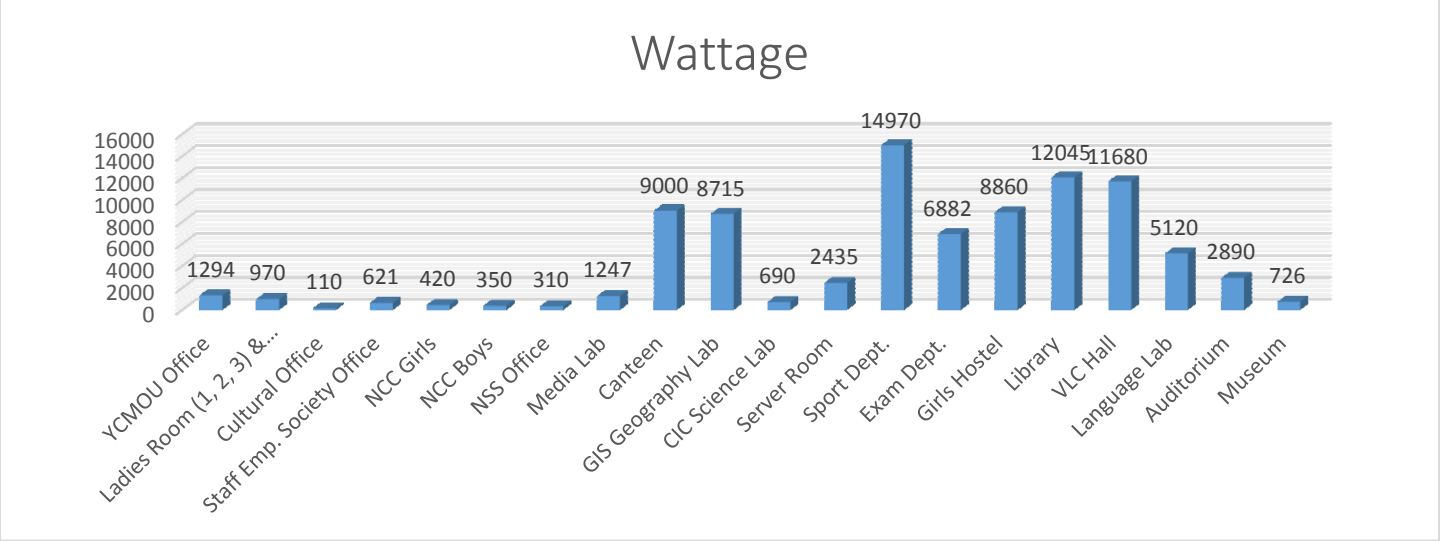
Suggestions: Improve Load Factor above 0.75

Chapter: 9 RSML Campus Connected Load Details

In the College Campus Electrical energy is used for various applications like: Computers, Printers, Xerox machines, LCD Projector, Router System, Lighting, Fans, Flood light, Pumping Motor, Air-Conditioning & Other Laboratory Equipment etc.

Major Energy use and Areas





Observations:

1. Maximum Connected Load IT Dep. 26480 Watts
2. Minimum Connected Load Cultural Office i.e. 110 Watts

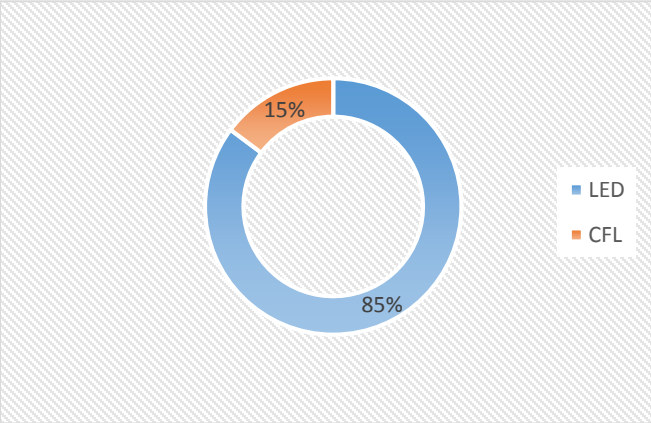
Suggestion:

Scope of Energy Conservation in IT department. Reduce Standby Losses.

Install Sensors in Class rooms. Install monitoring system.

Chapter: 10 Percentage of use LED Lighting

Type	Total
LED Lights Connected Load	22677
CFL Bulb Connected Load	3936
Total Lighting Load	**26613**

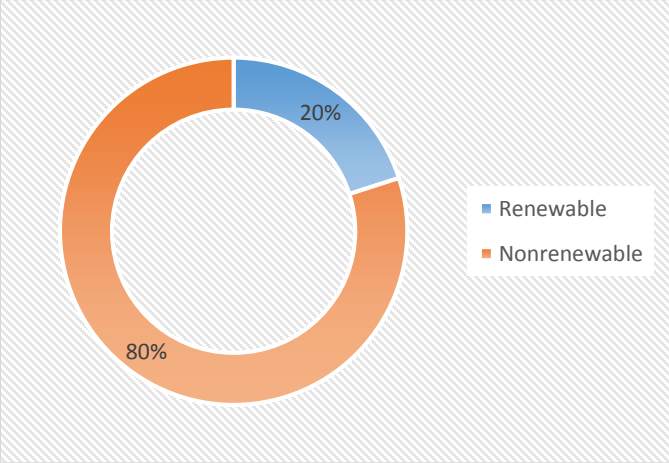


Observations: Percentage of Annual Power requirements met through LED Bulb/Tube Current year data is **85**%

Suggestions: Replace Inefficient lighting with Efficient LED Lighting

Percentage of Renewable Energy use

Average Renewable Energy units generated	35800	KWH
Nonrenewable Energy (Mahavitaran) imported	142817	KWH
Annual Total Power Requirement	178617	KWH



Observations:
Percentage of Annual Power requirements met through Renewable Energy Sources Current year data is **20**%

Suggestion:
Install additional Solar Power plant of 40KW

Chapter: 11 General Recommendations

a) Existing Lighting System :

Observations: Lux Level Min.81 Avg. 193 Max. 212

Existing LED Tube are installed without reflectors.

Suggestions: Improve effectiveness of Lighting System

Use motion sensors: In places where lights are necessary but are not used continuously.

Increase Lighting Efficiency by using reflectors

Light globes generally disperse light in all directions from the source. If a ceiling mounted light does not direct the light back down to the working plane, more fittings will be required to achieve the required lux levels. So the effectiveness of the reflectors (or minimizing losses due to poor reflectors) is important. Reflectors should be both reflective as well as carefully designed to disperse light effectively on the working plane at the design height of the fitting (e.g., light should not be concentrated in one area, providing too much light, whilst falling short of required levels in another area).

Silver Reflectors. This is the reflector that reflects the most light.

White Reflectors. More flexible between indoor and outdoor use.

1. Gold Reflectors 2. Black Reflectors 3. White Reflectors

Proposed:-

Activity	Illumination *(lux, lumen/m²)*
Public areas with dark surroundings	20 - 50
Simple orientation for short visits	50 - 100
Working areas where visual tasks are only occasionally performed	100 - 150
Warehouses, Homes, Theaters, Archives	150
Easy Office Work, Classes	250
Normal Office Work, PC Work, Study Library, Groceries, Show Rooms, Laboratories	500
Supermarkets, Mechanical Workshops, Office Landscapes	750
Normal Drawing Work, Detailed Mechanical Workshops, Operation Theatres	1,000
Detailed Drawing Work, Very Detailed Mechanical Works	1500 - 2000
Performance of visual tasks of low contrast and very small size for prolonged periods of time	2000 - 5000
Performance of very prolonged and exacting visual tasks	5000 - 10000
Performance of very special visual tasks of extremely low contrast and small size	10000 - 20000

b) Existing Fan System : (70W)

Total number of fans used in the campus = 650 Nos.

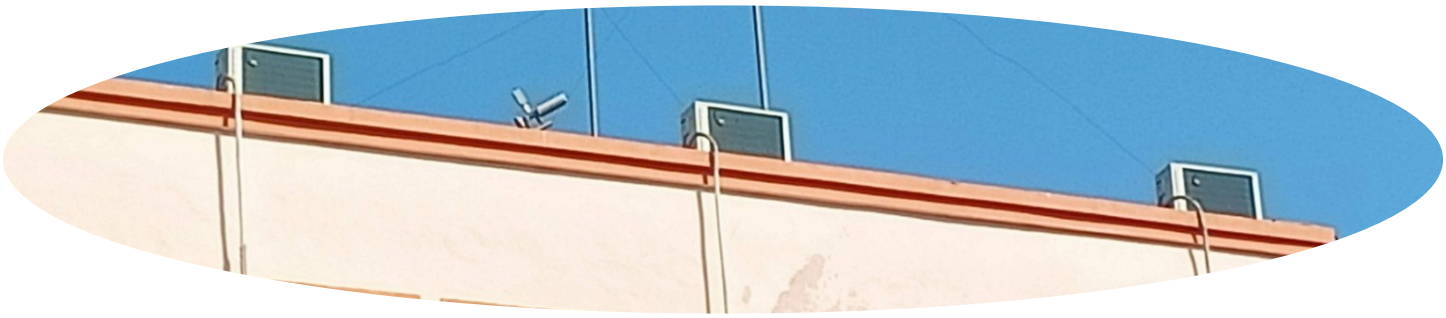
@275 days Working 6 Hrs.

- Number of fans to be replace = 650Nos.
- The Total Current Consumption =75075 kWh
- The Expected fan Consumption =3030 kWh
- Expected Saving per year = 45045 kWh/year

Suggestions: Replace existing Inefficient Fan System (75W) with Five Star BLDC (28W)

c) Existing Air Conditioning System :

The air around outside AC unit can be particularly hot, especially outdoor unit stands in direct sunlight with no trees around. AC unit is running less efficiently.



Observations:

An outdoor unit of an AC generates heat from direct sunlight.

Suggestions: Install Heat Proof Cover. Improve performance of Air-conditioning System.

The cover is well designed using top-grade insulation material to protect the AC's outdoor unit from the scorching heat.

Chapter: 12 Electrical Safety: Earth Resistance Test

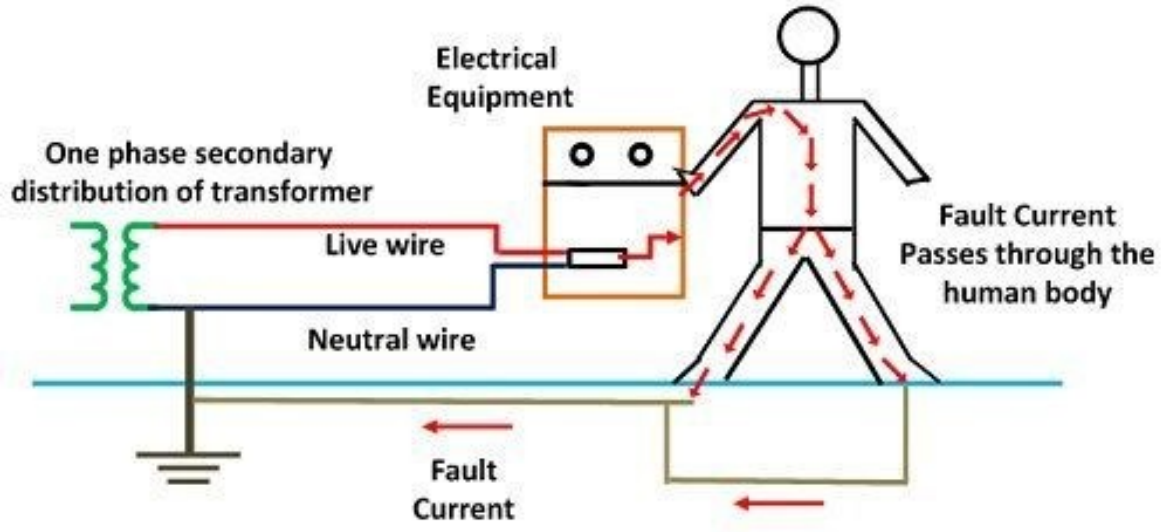
Observations:

Earth resistance Found 10.6 Ohm

Ideally a ground should be of zero ohms resistance. There is not one standard ground resistance threshold that is recognized by all agencies. However, the NFPA and IEEE have recommended a ground resistance value of 5.0 ohms or less.

Suggestions:

The use of chemical elements around the electrode of earthing systems reduces the earth resistance which improves the efficiency of these systems.



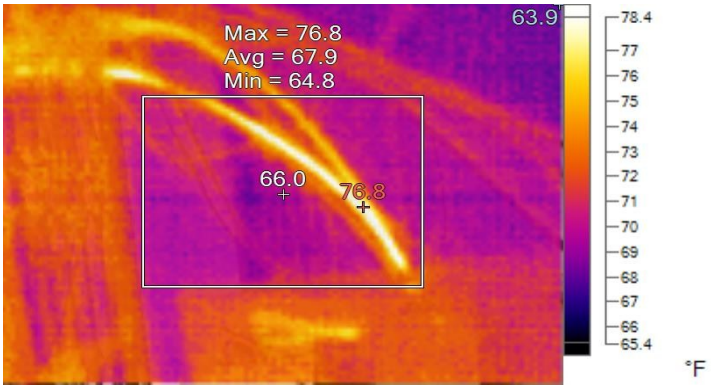
Electrical System Without Earthing

Circuit Globe

Chapter: 13 **Thermography:**

Inspected By: Kedar Khamitkar Energy Auditor

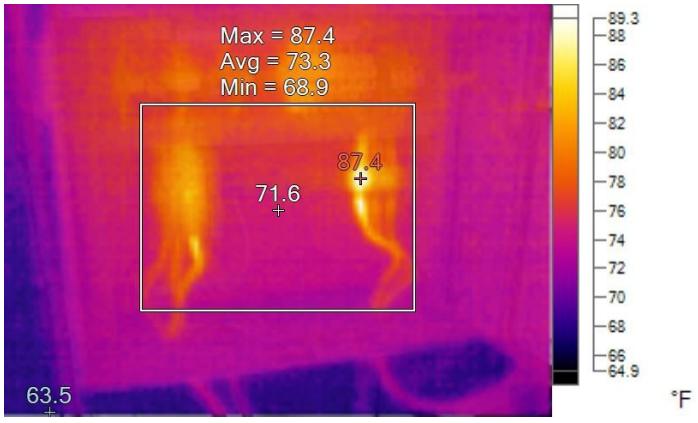
Equipment	**Main Panel Board**	Equipment Name:	**Distribution Cables**
Ambient Air Temp:		Wind Speed	
Load (%)		Max Rated Load:	
Exception Temperature:		Potential Problem	
Recommended Action		Repair Priority:	Immediate
Emissivity:	0.95	Reflected Temperature:	131.0 °F
Camera Manufacturer	Fluke	Camera:	PTi120HT-21120397



IR_00318.IS2

Inspected By:Kedar Khamitkar Energy Auditor

Equipment	**Main Panel Board**	Equipment Name:	**Bus bar Switches**
Ambient Air Temp:		Wind Speed	
Load (%)		Max Rated Load:	
Exception Temperature:		Potential Problem	
Recommended Action		Repair Priority:	Immediate
Emissivity:	0.95	Reflected Temperature:	131.0 °F
Camera Manufacturer	Fluke	Camera:	PTi120HT-21120397

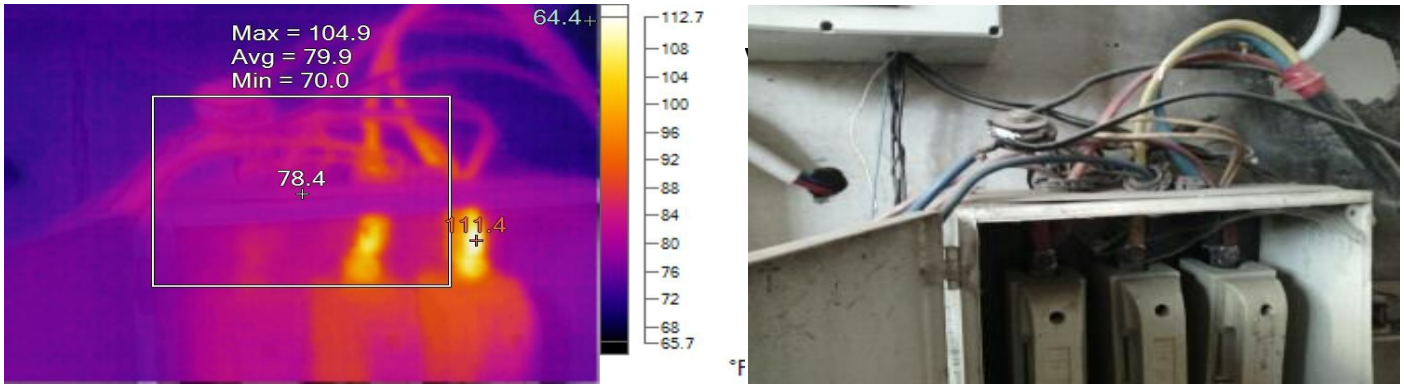


IR_00319.IS2

Thermography:

Inspected By: Kedar Khamitkar Energy Auditor

Equipment	**Main Panel Board**	Equipment Name:	**Bus bar Fuse Unit**
Ambient Air Temp:		Wind Speed	
Load (%)		Max Rated Load:	
Exception Temperature:		Potential Problem	
Recommended Action		Repair Priority:	Immediate
Emissivity:	0.95	Reflected Temperature:	131.0 °F
Camera Manufacturer	Fluke	Camera:	PTi120HT-21120397



IR_00316.IS2

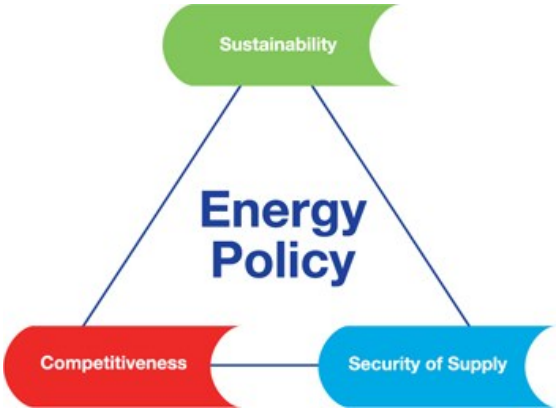
Observations : Fond "hot spots" or heat imbalances which may indicate loose or corroded connections or overload conditions that should be corrected in an electrical system.

INSTALL ELECTRICAL SAFETY SIGN BOARD

Electrical panels should also have secure covers to ensure no wires are exposed that could cause electrical shock. This also prevents the internal mechanisms from being exposed to dust, dirt, and moisture. Electrical panel boxes in commercial buildings should be secured and accessible by trained personnel only.

Chapter: 14 Executive **Recommendations -**

1. **Declare the Energy Policy**:



Energy policy is the scheme in which the organization addresses issues related to energy growth and usage including energy production, distribution, and consumption.

2. MOU with Experts for Energy Conservation Project. Energy auditing inside the campus has to be done on a regular basis and report should be made public to generate awareness.

3. **Create Awareness:** Conduct Institutional training Program periodically.

Need to create energy efficiency/ renewable energy awareness among the college campus i.e. solar, wind, Biogas energy. College should take initiative to arrange seminars, lectures, paper presentation competition among students and staff for general awareness.

Switch of the Air-conditioning system ½ an hour before leaving workplace.

Chapter: 15 Establish Energy Conservation Park

District level Energy Park is a Public Park for Education + Entertainment =Edutainment.

Objectives for establishing the park are:

- To impart awareness to the public, students, visitors, and beneficiaries about the use of renewable energy, its advantages, and its relation to the environment.
- Demonstrate the technology of various renewable energy devices to educate people on the subject.
- To provide a recreational center integrated with renewable energy education.
- To provide a forum for children to experiment with renewable energy devices.
- To fulfill the partial energy requirement of the park from renewable energy sources.

Educational models of solar energy, Hydel energy and Biogas energy projects etc. which provide information about their basic concepts to these young minds.

Install Electric Vehicle Solar Charging Stations, EV Chargers

Revenue Projections to the institute from a Typical Public Charging Station.

Chapter 16 : **Apply for ECBC :**

The Energy Conservation Building Code (ECBC) was developed by the BEE Govt. of India. ECBC sets minimum energy standards for commercial buildings having a connected load of 100kW or contract demand of 120 KVA and above.

While the Central Government has powers under the EC Act 2001, the state governments have the flexibility to modify the code to suit local or regional needs and notify them. Presently, the code is in voluntary phase of implementation. About 22 states are at various stages of mandating ECBC, wherein most of building construction activities are happening across the country.

ECBC scope for the Existing RSML Institute Building:

In existing RSML building we could save up to 30 percent of electricity by applying ECBC code. For this we could do retrofitting in the existing building and can make building close to ECBC compliant building.

Energy Audit Studies have revealed a savings potential to the extent of 40% in end use such as lighting, cooling, ventilation, refrigeration etc. In order to address this institutional barrier, the Bureau of Energy Efficiency has taken up the task of institutionalizing energy efficiency services, and of promoting energy efficiency delivery mechanisms.

Complementing the efforts of the government of India, the ECBC has been integrated in other rating & compliance systems being followed in the country such as EIA (Environmental Impact Assessment) for large area development under MoEF (Ministry of Environment & Forest), Green Rating for Integrated Habitat Assessment (GRIHA) rating system of ADARSH **and** Leadership in Energy & Environmental Design (LEED) rating system of **the** Indian Green Building Council (IGBC)**.**

प्रतिज्ञा

हम सत्यनिष्ठा से प्रतिज्ञा करते हैं कि अपने सभी कार्यों में पेट्रोलियम उत्पादों के संरक्षण हेतु सतत् प्रयासरत रहेंगे, ताकि देश की प्रगति के लिए आवश्यक ये दुर्लभ संसाधन दीर्घकाल तक टिके रहें। आदर्श नागरिक होने के नाते हम अधिकाधिक लोगों को तेल एवं गैस संरक्षण के प्रति सजग करेंगे ताकि पेट्रोलियम पदार्थों के दुरुपयोग से बचा जा सके।