

2968

DTE Institute Code : 6217



Estd 2009

Shri Balasaheb Mane Shikshan Prasarak Mandal's
ASHOKRAO MANE GROUP OF INSTITUTIONS

Address : Vathar Tarf Vadgaon, Tal. Hatkanangale, Dist. Kolhapur - 416 112 (Maharashtra)

Phone : (0230) 2407740, 2407760 **Fax :** (0230) 2407750 **Email :** director@amgoi.edu.in **Website :** www.amgoi.org

Approved by : AICTE, New Delhi No. F-No. MS (Newint) 2009 / 08, Higher & Technical Education Department, Govt. of Maharashtra, Directorate of Technical Education, Mumbai. **Affiliated to :** Dr. Babasaheb Ambedkar Technological University, Lonere - Raigad. (B.Tech. & M.Tech. Programs), Shivaji University, Kolhapur. (MBA Program).

Accredited by NAAC with 'A' Grade CGPA 3.08

Founder President
Late Shri. Ashokrao Mane

Director
Dr. H. T. Jadhav, M.E., Ph.D.

President
Hon. Shri. Vijaysinh A. Mane

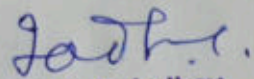
Ref. No. :

Date :

Certificate of Energy Audit

This is to certified that **Tatyasaheb Kore College of Pharmacy, Warananagar.**
Tal: - Panhala, Dist.: - Kolhapur has successfully undergone **Energy Audit on 22 May 2023** and assessed the electrical energy conservation, energy saving measures and sustainability in compliance with the applicable regulation, policies and standards in the campus were found to be **excellent.**

Place- Vathar Tarf Vadgaon


Dr. H. T. Jadhav
Director AMGOI, Vathar
Certified Energy Auditor (BEE),
Reg. No. - EA - 3023

eSign

Signed by: John Intru
Disouza
Reason: NAAC
Location: Warananagar, India
Date: 02-Jun-2023 (04:42
PM)

2986

DTE Institute Code : 6217



Shri Balasaheb Mane Shikshan Prasarak Mandal's
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02 May 2022 and assessed the electrical energy conservation, energy saving

measures and sustainability in compliance with the applicable regulation, policies

and standards in the campus were found to be **excellent.**

Place- Vathar Tarf Vadgaon


Dr. H. T. Jadhav
Director AMGOI, Vathar
Certified Energy Auditor (BEE)
Reg. No. - EA - 3023

2901

DTE Institute Code : 6217

Shri. Babasaheb Mane Shikshan Prasarak Mandal's

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Dr. H. T. Jadhav, M.E., Ph.D.

President
Hon. Shri. Vijaysinh A. Mane

Ref. No. :

Date :

Certificate of Energy Audit

This is to certified that **Tatyasaheb Kore College of Pharmacy, Warananagar.**


Tal: - Panhala, Dist.: - Kolhapur has successfully undergone **Energy Audit on**

20 May 2021 and assessed the electrical energy conservation, energy saving

measures and sustainability in compliance with the applicable regulation, policies

and standards in the campus were found to be **excellent.**

Place- Vathar Tarf Vadgaon


Dr. H. T. Jadhav,
Director AMGOI, Vathar
Certified Energy Auditor (BEE)
Reg. No. - EA - 3023

ENERGY AUDIT REPORT

Client Name	Tatyasaheb Kore College of Pharmacy, Warananagar. Tal: - Panhala, Dist.: - Kolhapur Maharashtra, India, Pin 416113
Project Name	Tatyasaheb Kore College of Pharmacy, Warananagar. Tal: - Panhala, Dist.: - Kolhapur Maharashtra, India, Pin 416113
Date	Year 2021-22
Submitted by	Department of Electrical Engineering Ashokrao Mane Group of Institutions Vathar Tarf Vadgaon, Tal- Hatkanangale, Dist.-Kolhapur (Maharashtra state)



DISCLAIMER

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ACKNOWLEDGEMENT

We appreciate the interest and participation of Honorable Management and Principal and Faculty in carrying out the energy audit at **Tatyasaheb Kore College of Pharmacy, Warananagar. Tal: - Panhala, Dist.: - Kolhapur.** Our special thanks to Technicians and Staff involved for college who have extended their co-operation and courtesy to the energy audit team during the audit. Our Special thanks to Honorable Management and Director of Ashokrao Mane Group of Institutions Vathar Tarf Vadgaon for continuous support and providing facilities regarding the energy audit.



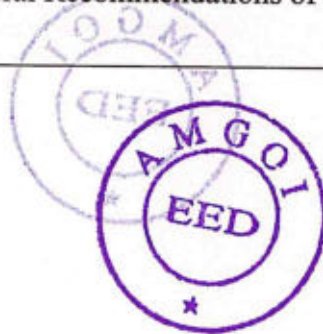
THE ENERGY AUDIT TEAM

Team Member	<p data-bbox="619 450 1238 689">Dr. H.T. Jadhav Certified Energy Auditor Bureau of Energy Efficiency Director AMGOI, Vathar Tarf Vadgaon.</p> <p data-bbox="687 775 1166 947">Mr.R.S.Pukale Assistant Professor AMGOI, Vathar Tarf Vadgaon.</p>
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INDEX

Chapter	Title	Page
1	Executive Summary	5
2	Summary of savings potential in Class rooms and Laboratory	6
3	Summary of analysis of current energy Scenario	11
4	Scope of Work	15
5	Methodology of the Audit	16
6	Conclusion and General Recommendations of the Audit	21



1. EXECUTIVE SUMMARY (Lighting Load):

Recommendations	Monthly present expenditure in Rs.	Investment for the saving of expenditure in Rs.	Savings per month in Rs.	Payback period in years.
Instructional Building. Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -66 no Replace 80W old fan by energy efficient fan. Quantity -56 no	Rs.21787.2/-	LED Tub set=450*66 =29700/- Fan -3500*56 =196000/- Total=225700/-	Cost of energy Rs.10036.8 Saving= Rs.21787.2- Rs. 10036.8 = Rs.11750.4/-	1.60 yrs.



2. SUMMARY OF SAVINGS POTENTIAL OF COLLEGE

Instructional Building														
	No. of Tube light	No. of Fan	No of AC	Projector	No of Computer	LED Bulb	T.V	Printer	Xerox machine	Gas Geyser	Electric Motor	C.C.T.V.	Inverter	
Principal cabin	2	1			1		1	1						
Office no.1	3	2			3			1				1		
Office no.2	2	1			2							1		
Store Room	1	1			1			1				1	1	
library	2	3			2							1		
Student Reading Room	2	1										1		
Exam strong Room	2	1			1			1	2			1		
Girl common room	1	1				2								
Computer Lab	3	3			26			1				1		
Class Room 1	3	2		1	1							1		
Class Room 2	4	2		1	1							1		
Class Room 3	2	1		1	1							1		
laboratories 1 (chemistry-1)		2			1							1		
laboratories 2 (chemistry-2)	4	2										1		
laboratories 3 (machine room)	5													



laboratories 4 (pharmacology)	2	2			1							1	
laboratories 5 pharmaceutics 1	2	3										1	
laboratories 6 pharmaceutics 2	2	2			1							1	
laboratories 7 microbiology	1	2										1	
laboratories 8 cell culture			2		1	7		1					1
laboratories 9 Ph 1 m.pharm	1	1			1	2						1	
laboratories 10 Ph 2 m.pharm	1	1			1	2						1	
laboratories 11 CFC	2	2	1		6	2						2	
laboratories 12 P.A. lab	2	1			1	2						1	
M.pharm store	3				1	1						1	
laboratories 13 Pharmacognosy lab	2	2			1							1	
laboratories 14 CO2 Ext.		2				4							
Conference hall	2	1		1	1								
Auditorium hall	4	14		1		4						2	



Ground floor porch	4											4	
1 st floor porch	2											2	
2 nd floor porch						4						2	
Total	66	56	3	5	55	30	1	6	2	0	0	33	02



1) Instructional Building :

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	66	6	2.64	15.84	Replace 40W tube set by 20W LED tube set.
2	Fan	80	56	6	4.48	26.88	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	3	6	3.21	19.26	Nil
4	Projector	300	5	6	1.5	9	Nil
5	Computer system	250	55	6	13.75	82.5	Nil
6	LED bulb	20	30	6	0.6	3.6	Nil
7	T.V	60	1	6	0.06	0.36	Nil
8	Printer	40	6	4	0.24	0.96	Nil
9	Xerox Machine	1500	2	4	3	12	Nil
10	Geyser	3000	0	0	0	0	Nil
11	Electric Motor	3728.5	1	4	3.7285	14.914	Nil
Total					33.2085	185.314	
Total Lighting load =			3.24	Qty=	96		
Led lighting load =			0.6	Qty=	30		

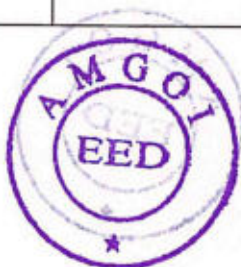


3. SUMMARY ANALYSIS OF CURRENT SCENARIO

3.1 ANALYSIS ENERGY METER.

As per MSEDCL 147 HT-VIII B

Consumption Slab (kWh)	Fixed/ Demand Charge Rs./kVA / month	Wheeling Charge (Rs/kWh)	Energy Charge (Rs./kWh)	
All Units	174650	0.60	10.79	
TOD Tariffs (In addition to above base tariffs)				
TOD Tarrifs	Rate% (Rs./Unit)	Units	Demand	Charges Rs.
00.00 Hrs – 06.00 Hrs.	-1.5000	11058	135.00	-16587.00
22.00 Hrs – 06.00 Hrs.				
06.00 Hrs – 09.00 Hrs.-	0.0000	0	172.00	0.00
12.00 Hrs – 18.00Hrs.				
09.00 Hrs – 12.00 Hrs.	0.8000	0	104.00	0.00
18.00 Hrs – 22.00 Hrs.	1.1000	9486	141.00	10434.60



Approx. Unit charges including taxes: - Rs.17/- Unit

Maximum Consumption in year 2022-23 = Jul-22 (37020 units)

262029205021'				
Sr.No	Month	Unit Consumed in KWh	Bill Demand (KVA)	Bill Amount, Rs.
1	Mar-23	18180	325	419620
2	Feb-23	14029	325	366678
3	Jan-23	22405	325	467563
4	Dec-22	35740	325	645845
5	Nov-22	32870	325	610866
6	Oct-22	36474	325	644432
7	Sep-22	19131	325	425491
8	Aug-22	20183	325	436919
9	Jul-22	37020	325	637717
10	Jun-22	32318	325	583044
11	May-22	29372	325	497343
12	Apr-22	25272	325	453466
	Total	3,22,994		61,88,984
	Maximum	37020		645845
	Minimum	14029		366678
	Avarage	26,916		5,15,749



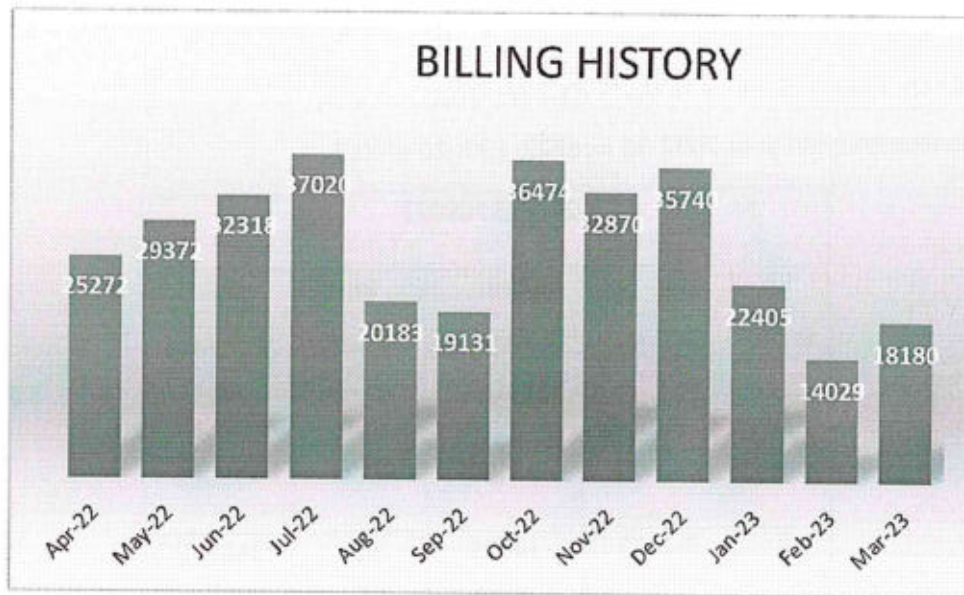


Fig 1: Monthly unit Consumption 2022-2023





श्री वारणा विभाग शिक्षण मंडळ, वारणानगर



प्रा. डॉ. वासंती रासम, प्रशासकीय अधिकारी

ग्रामदार डॉ. विनय वि. कोरे, प्रमुख

संदर्भ क्र.:

दिनांक :

१०/५५९/२०२२-२४.

३१/०३/२०२३.

प्रति,
ग्रामी प्राचार्य,
तात्यासाहेब कोरे कॉलेज ऑफ फार्मसी (बी),
वारणानगर.

विषय : बीज बिलाच्या रकमेबाबत..

महोदय,

आमचे शिक्षण मंडळ परिसरांतर्गत खर्च झालेल्या बीज बिलापैकी आपले महाविद्यालयाकडून खाली दिलेल्या तपशीलाप्रमाणे बीज बिलाची रकम आपलेकडून शिक्षण मंडळास देय होत आहे. तरी सदरच्या रकमेचा चेक इकट्टील कार्यालयाकडे जमेल पाठवून देणेत यावा व त्याप्रमाणे आपलेकडील रेकॉर्डला हिशोबी जमाखर्च करणेत यावा.

रकम रुपये ६,५७,४५८/- (अक्षरी रुपये सहा लाख सत्तावन्न हजार चारशे अठ्ठावन्न आणि पैसे शून्य फक्त)

अ.न.	तपशील	बीज युनिट	बीज दर प्रती युनिट	रकम
१	बीज बिल - (माहे मार्च, २०२२ ते माहे फेब्रुवारी, २०२३ अखेर)	३८६७४	१७.००	६,५७,४५८/-
		एकूण..		६,५७,४५८/-

सं. वा. ३०३०

आपली विरवासू,

(डॉ. वासंती रासम)

प्रशासकीय अधिकारी

श्री वारणा विभाग शिक्षण मंडळ
वारणानगर, ता. पन्हाळा, जि. कोल्हापूर

• ता. पन्हाळा, जि. कोल्हापूर-४१६ ११३, फोन: ०२३२८-२२४०३०, २२३५६१ •

• E mail. aoswsm@gmail.com vasantli.rasam@gmail.com •



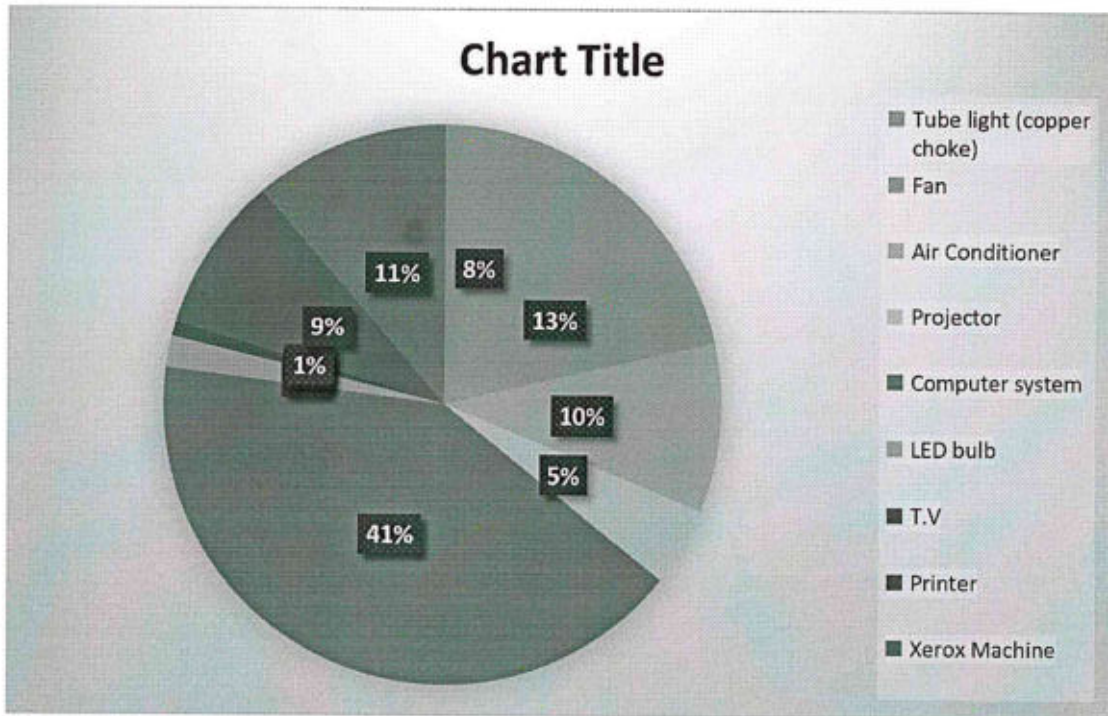


Fig 2: Building wise Connected load distribution

3.2 INSTITUTE IN PROCESS TOWARDS ENERGY CONSERVATION:

- Step by step replacing the 40 Watt i.e. T12 Fluorescent Tube Lights in the class rooms and Laboratory rooms and using 12W LED which gives almost same luminous flux.
- Replacing the 80W ceiling fan in class rooms and laboratories by energy efficient fans of 35 w is much help to save the energy.



4.0 SCOPE OF WORK:

1. Detailed examination of the existing energy uses of the facility.
2. Measurement and analysis of demand and power factor, energy meter to reduce the energy bill.
3. Detailed examination of lighting system and other electrical equipment in laboratory and class rooms.
4. Survey report of lighting system in overall institute.



5. METHODOLOGY:

5.1 MEASURED LUX LEVELS:

Sr.no.	Location/ Area/ Room	Measured Lux	Recommended Lux Level
01	Principal cabin	300	300-500
02	Office no.1	200	300
03	Office no.2	85	100
04	Store Room	150	300
05	library	100	300
06	Student Reading Room	95	100
07	Exam strong Room	150	300
08	Girl common room	150	300
09	Computer Lab	150	300
10	Class Room 1	200	300
11	Class Room 2	175	300
12	Class Room 3	175	300
13	laboratories 1 (chemistry-1)	175	300
14	laboratories 2 (chemistry-2)	170	300
15	laboratories 3 (machine room)	180	300-500
16	laboratories 4 (pharmacology)	200	300-500
17	laboratories 5 pharmaceutics 1	190	300-500
18	laboratories 6 pharmaceutics 2	175	300-500
19	laboratories 7 microbiology	150	300-500
20	laboratories 8 cell culture	165	300-500
21	laboratories 9 Ph 1 m.pharm	175	300-500
22	laboratories 10 Ph 2 m.pharm	175	300-500
23	laboratories 11 CFC	200	300-500



24	laboratories 12 P.A. lab	180	300-500
25	M.pharm store	180	300-500
26	laboratories 13 Pharmacognosy lab	190	300-500
27	laboratories 14 CO2 Ext.	175	300-500
28	Conference hall	175	300-500
29	Auditorium hall	175	300-500
30	Ground floor porch	175	300-500
31	1 st floor porch	150	300
32	2 nd floor porch	175	300-500



5.2 SAVING POTENTIAL CALCULATION IN EACH CLASS ROOM AND LABORATORY:

Assumptions: - Working hours of class room, laboratory and office = Approx.6hrs
Unit for institute energy bill = Approx. Rs.17/ kwh

Specimen calculation for Principal Cabin :

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	2	6	0.08	0.48	Replace 40W tube set by 20W LED tube set.
2	Fan	80	1	6	0.08	0.48	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	0	6	0	0	Nil
5	Computer system	250	1	6	0.25	1.5	Nil
6	LED bulb	20	0	6	0	0	Nil
7	T.V	60	1	6	0.06	0.36	Nil
8	Printer	40	1	4	0.04	0.16	Nil
9	Xerox Machine	1500	0	4	0	0	Nil
10	Geyser	3000	0	0	0	0	Nil
11	Electric Motor	3728.5	0	4	0	0	Nil
Total					0.51	2.98	
Total Lighting load =			0.08	Qty=	2		
Led lighting load =			0	Qty=	0		

Specimen calculation for tube set :- Energy consumption of conventional tube light set :- 40Watt capacity tube set used for 6hrs per day so unit consumed by tube is $\frac{40\text{Watt} \times 6\text{hr}}{1000} = 0.24\text{kwh}$ per day and monthly unit consumed by tube set = 0.24×30 days = 7.2 kwh / month. Energy consumption of one tube in terms of rupees = 7.2 kwh x Rs.17 = Rs.122.4/-.

Specimen calculation for Fan :- A old fan capacity is 80W and used for 6 hrs. day so unit consumed by fan is $\frac{80\text{Watt} \times 6\text{hr}}{1000} = 0.48$ kwh per day and monthly unit consumed by fan = 0.48×30 days = 14.4 kwh / month. Energy consumption of fan in terms of Rs. = 14.4 kwh x Rs.17 = Rs.244.8/-.

Staff room has one old ceiling fan. So monthly expenditure due to fan is Rs.244.8/-.



If old fan will have replaced by new energy efficient (BEE star rating) it will consume energy Rs. 100.8/- for one month.

Computer lab :- Replace 80W old fan by energy efficient fan (1no)	Cost of energy Rs.244.8/-	Investment for BEE star rated Fan - Rs.3500	Cost of energy Rs.107.1 Saving=Rs.244.8. -Rs. 107.1 = Rs.137.7	Payback period 2.12 yrs.
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Tube set type	Cost Rs.	Payback	Life	Efficacy
T-8 LED tube light 1.00 inch	1600-2000	3-4 Yrs	10-15 Yrs.	@100-120 Lumens / watt
T-5 LED tube light 0.625 inch	500	6 month-1yr.	3-4 yrs.	110 lumens /watt

Evolution of BEE 5 star rated Fan

Speed	1	2	3	4	5
Wattage	13 W	24 W	30 W	40W	55W

Cost: - Rs. 1700 -2000 and Life: - 10-15 yrs.

Evolution of regular rated Fan

Speed	1	2	3	4	5
Wattage	14 W	26 W	39 W	48 W	76 W

Cost: - Rs. 1000 -1500 and Life: - 5-10 yrs.

A typical desktop computer uses about up to 250 watts and 20-40 watts for an LCD monitor and don't forget related devices like cable modem uses 7 watts, D-Link DI-604 router uses 4.5 watts,

To calculate your costs, use this formula:

$$\frac{\text{Watts x Hours Used}}{1000} \times \text{Cost per kilowatt-hour} = \text{Total Cost}$$

One LCD computer consumes 1.5Kwh (Unit) per day i.e. 9Rs. Per day (300 W x 5 hrs.)

Old version computer consumes 2.5kwh(unit) per day i.e.15Rs. per day (500 W x5hrs)



Dr. H. T. Jadhav
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Reg. No. - EA - 2023



6.0 CONCLUSIONS AND GENERAL RECOMMENDATION OF THE AUDIT

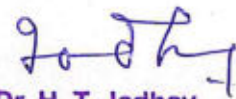
- a) Replace conventional tube light fittings of 40W with T-5 LED Tube light for 400 – 500 lumens light efficacy. Replace 80 W old fan by energy efficient fans.
- b) Replace old version computer system with energy efficient LCD monitor and new generation energy efficient computer systems.
- c) Ensure maximum natural daylight and natural ventilation in class rooms, Labs and staff rooms i.e. when it's bright outside in the daytime, turn off the light and open blinds of windows.
- d) In fact, try to turn on lights in our cabin, labs only after the sun sets. Do your reading and writing near a window or natural illumination.
- e) Installing occupancy sensors to turn ON-OFF lighting and fan can save considerable energy.
- f) Overhead projectors, computers and UPS all use electricity for power. Be sure to unplug these types of items when they're not in use can achieve energy saving considerably.
- g) Use power "saving option" (hibernate mode) for computer and possibly switched off when not in use.
- h) Consider planting trees and shrubs in strategic locations to help to reduce the temperature and airflow in Laboratory, classroom etc. Trees planted on the west and south sides of buildings help to keep the buildings shaded during hotter weather.
- i) to promote Green Energy and Energy Conservation a roof-top Solar PV plant can be useful.
- j) Suggested to protect all Transformer, Generators and UPS with fencing and keep the awareness boards and safety signs on 'Dangers' and 'Warnings, etc.
- k) Advised to cover Electrical wires, switch boxes, inverters, and stabilizers not to cause any problem to the staff and student members.
- l) Advised to replace old generation computers and TVs with LED monitors and old incandescent (tungsten) bulbs with LED lights and install automatic street solar lights.
- m) Suggested to install Roof top solar power plants.



Mr.R.S.Pukale

Energy Audit Coordinator

Department of Electrical Engineering



Dr. H. T. Jadhav

Director AMGOI, Vathar

Certified Energy Auditor (BEE)

Reg. No. - EA - 3023

